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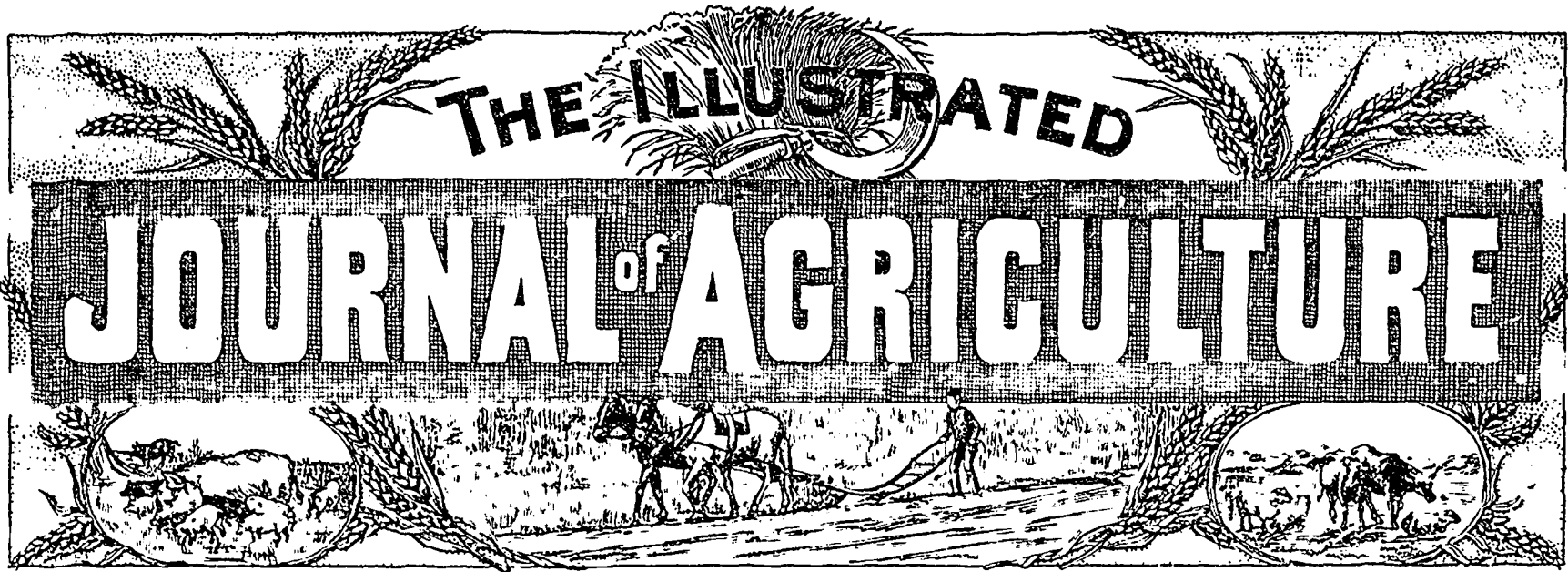
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All matters relating to the reading columns of the Journal must be addressed to Arthur R. J. East, Editor of the JOURNAL OF AGRICULTURE, 4 Lincoln Avenue, Montreal. For subscriptions and advertisements address the Publishers.

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MONTREAL.

**L. O. ARMSTRONG,**  
Colonization Agent,  
MONTREAL.

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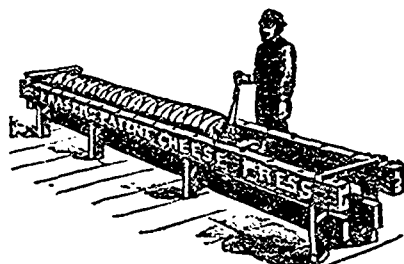
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THE ILLUSTRATED  
Journal of Agriculture

Montreal, April 1, 1893.

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Public Notices.

Department of Agriculture and Colonisation.

Quebec, March 25th 1893.

Sir,  
The following counties are invited, this year, to take part in the provincial competition of Agricultural Merit.  
Argenteuil (division of the Laurentides), Berthier, Champlain, Joliette, L'Assomption, Maskinongé, Montcalm, Ottawa, Pontiac, Saint-Maurice, Terrebonne (division of the Laurentides), Three-Rivers.  
In accordance with the rules of the Council of Agriculture, the competitors

who desire to submit their farms to the scrutiny of the judges of this competition must send in their entries to the Department of Agriculture and Colonisation, at Quebec, on or before June the first in each year.

Any one desirous of competing can obtain the necessary blanks for entries, and, at the same time, acquire all requisite information, by applying to either the secretary of the agricultural society or of the farmer's club to which he belongs or to the Commissioner of Agriculture.

All those who have won prizes, during the last five years, in the competitions for the best cultivated farms, are allowed to compete.

In accordance with an amendment adopted in the session of 1892, any one wishing to take part in the provincial competition of Agricultural Merit, who during the last five years, has not won a prize in the competition for the best cultivated farms, shall be obliged to send with the notice he forwards to the Commissioner of Agriculture of his intention to compete, the sum of five dollars.

We trust that your district (*région*) will furnish a good number of competitors, and that it will make a point of not allowing itself to be beaten, either in number or merit, by the competitors of former years.

I have the honour to be, Sir,  
Your obedient servant,  
G. A. GIGAUULT,  
Assistant-Commissioner.

Public Meetings.

Deliberations of the Council of Agriculture of the Province of Quebec

JANUARY 23th, 1893

Copy of a report of a Committee of the Hon. Executive Council, dated March 25th, 1893, approved by the Lt. Governor March 25th, 1893.

No. 130.—On the approval of the deliberations of the Council of Agriculture.

The Hon. Commissioner of Agriculture and Colonisation, in a memorandum, dated the 25th of March current (1893), recommends that the resolutions, contained in the extract annexed to the above memorandum, of the Council of Agriculture, of the 23rd of January last, be approved, in conformity with the article 1614 of the Revised Statutes of the province of Quebec.

(Certified copy)  
(Signed) GUSTAVE GRENIER,  
Clerk to the Executive Council

The Council of Agriculture of the Province of Quebec

EXTRACT FROM THE DELIBERATIONS OF JANUARY 23rd, 1893.

Present: The Honorable Commissioner of Agriculture, the Honorable Superintendent of public Instruction, the Honorable A. C. P. R. Landry, Joly de Lotbinière, F. X. O. Méthot, the Reverend M. Montminy, L. O. Tremblay, M.M. Beauchamp, M.P.P., McDonald, M.P.P., Girard M.P.P., J. de L. Taché, Marsan, Ness, Brodeur, Tylee, Foster, Grignon, Lamarche, Ayer and Patten.

The secretary read the orders in Council, No 638, appointing a new Council of Agriculture, and No 666, nominating the Hon. F. H. O. Méthot, to replace M. Flavien Dupont.

The Hon. Commissioner of Agriculture opened the meeting by requesting the Council to organize itself by the nomination of its officers. The following elections were made unanimously:

President. The Hon. H. G. Joly de Lotbinière,  
Vice-président. The Hon. A. C. P. R. Landry.

COMMITTEES.

*Competition of Agricultural Merit:* M.M. Beauchamp, M.P.P., Girard, M.P.P., Ness, J. de L. Taché, Brodeur, Dawes, and the Rev. G. Tremblay.

*Agricultural Schools:* The Hon. M.M. Ouimet, Landry, Macintosh; M.M. Ayers, MacDonald and Lamarre  
*The Journal:* The Hon. H. G. Joly, de Lotbinière, the Revd. M.M. Dauth and Montminy; M.M. Marsan and Tylee.

*Herd and Stud-books:* The Hon. T. H. O. Méthot; M.M. Foster, Patten, Grignon, Ness; and as assistants; M.M. Lesage, E. Casgrain, Couture and Barnard.

The deliberations of the last meeting of the Council of Agriculture were read and approved.

Resolved that M. Gabriel Dumont, farmer, of the parish of Ste Hénédine, be appointed Director of the Agricultural Society of the County of Dorchester, in virtue of Cap. 22 of the 55th, 56th Viet.

Resolved that M. Moise Ménard, farmer, of Acton-Vale, be appointed Director of the Agricultural Society of the County of Bagot, in conformity with Cap. 22 of the 55th-56th Viet.

Resolved that the Hon. J. A. Ouimet be appointed Director of the Agricultural Society of the County of Laval, in virtue of Cap. 22 of the 55th-56th Viet.

Resolved that the following members of the Council of Agriculture be appointed Directors of the Agricultural Societies, in virtue of Cap. 22 of the 55th-56th Viet., as follows.

FOR THE COUNTIES OF

Arthabaska, Compton and Stanstead, the Hon. John McIntosh.

Champlain and Nicolet, the Hon. F. X. O. Méthot.

L'Islet, Montmagny and Montmorency, the Hon. A. C. P. R. Landry.

Lotbinière, Mégantic, Portneuf and Quebec, the Hon. H. G. Joly de Lotbinière.

Argenteuil, Ottawa (A. S. Div. A. 1.), and Ottawa (S. A. Div. A. 2), M. B. Beauchamp, M. P. P.

Beauharnois, Chateauguay, Huntingdon No. 1 and Huntingdon No. 2, Mr. Robert Ness.

Berthier, Joliette and Montcalm, M. L. J. A. Marsan.

Bras and Iberville Mr. Ora P. Patton.

Charlevoix, Chicoutimi, Saguenay and Lac St. Jean, M. Jos. Girard, M. P. P.

Drummond and Richmond, Mr. Milton McDonald, M. P. P.

Hochelega and Terrebonne, M. I. M. Charles D. Tylee.

Laprairie, M. Basile Lamarre.

Missisquoi, Napierville and St. Jean, Mr. A. A. Ayer.

Ottawa No. 2, Div. B. and Terrebonne No. 2, M. Wilfrid Grignon, M. D.

Richelieu, Rouville and Verchères, M. Timothé Brodeur.

Shofford and Sherbrooke, Mr. Hiram S. Foster.

St. Hyacinthe and Wolfe, M. J. de L. Taché.

Soulanges and Vaudreuil, Mr. Andrew J. Dawes.

Beauce Div. A. and Beauce Div. B., Reverend M. Montminy.

Kamouraska, Rimouski and Témiscouata, Reverend M. L. O. Tremblay.

St-Maurice, Three-Rivers and Yamaska, Reverend M. Naud.

Resolved that the Legislature be prayed to amend Art. 1659 of the R. S. P. Q., so as to substitute the word "February" for the word "May".

Resolved that Art. 67 of the rules of the Council of Agriculture be amended so as to read as follows: That all funds belonging to the Agricultural Societies, from whatever source derived, be deposited, in the name of such society, in some incorporated bank, having a "savings" department, and that, in future, such funds shall not be withdrawn except by a cheque signed by the president and the secretary-treasurer of such society; and that the name of such monetary institutions, where such deposits are made, be given in the annual report, and that the Department of Agriculture be informed as soon as possible, of such deposits, and of any change in the choice of such bank by that society.

The Council of Agriculture heard the contents of a letter from Mr. R. Campbell, President of the Horticultural Society of Quebec drawing the attention of the Council to the Rules of the Horticultural Societies, published at p. 96, English edition, of the rules of the Council of Agriculture. The Council, after comparing the letter of Mr. Campbell with the text of the law, sect. 1676 and following, and with the said rules of the Council, finds that Mr. Campbell is right.

The Secretary of the Council of Agriculture was requested to thank Mr. Campbell for his excellent essay, and to prepare for the next meeting of the Council all the alterations necessary in the said rules of the Council that refer to the Horticultural Societies.

M. Taché, supported by Dr. Grignon, proposed: that the arrangement for the distribution of the *Journal of Agriculture*, proposed by the government, is approved by the Council. Carried on a division.

The Council adjourned to Thursday, January 26th, 1893, at 9 a. m.

On the 26th January, 1893, at 9 a. m., the same members being present, and the Hon. H. G. Joly de Lotbinière in the chair.

It was resolved that Act. 3 of the rules of the Council of Agriculture be recalled, and that, in future, the votary-surgeons, attached to the Council, be only requested to be present at the meetings of the Council when their presence shall be considered necessary.

Resolved that the Council of Agriculture recognises the importance of putting into execution clause 1600 of the law, and it recommends, in consequence, that there be taken the measures necessary to obtain every kind of information on the state of agriculture and on the most fitting means to promote its progress, and the Council prays the Hon. Commissioner to furnish to these societies, under the form of a set of questions, the subjects on which the directors and members of the societies, in each parish, are to deliberate and report.

Resolved that Dr. Grignon and Mr. Tylee be requested to study the questions to be submitted to the Agricultural societies in virtue of the preceding resolution.

The request of the Agricultural Society of Jacques-Cartier County asking for the nomination, by the Council of Agriculture, of M. Avila Legault, as Director of that society, was granted.

The request of the County of Chambly, asking the Council of Agriculture to appoint M. Nap. Daigneau a director of that society was granted.

The request of the Agricultural Societies of Gaspé No. 1, Div. C., of Lako St-Jean and of the Saguenay, to

be allowed, this year only, to employ their subscriptions for the purchase of seed-grain and grass-seeds, was granted; but for this year alone, in consideration of the special conditions in which these counties are placed.

The Council of Agriculture would respectfully draw the attention of the Commissioner of Agriculture to the advantages to be derived from holding an annual exhibition of fat poultry, like those that are held yearly at Smith's Falls, Ont., and in other places, with a view to getting a better market for such products; and the Council recommends that a competent person be appointed by the Department to inquire into the working of these exhibitions, and to report on the possibility and the advantages of holding similar shows in the province.

The Council of Agriculture recommends the Agricultural Societies, and those interested, to be good enough to select, with the greatest care, the seed-grain, and the grass-seeds for sowing, so that they be free from any mixture, and be of the best possible quality.

It was resolved that the prayer of the Agricultural Society of the County of Beauce, No. 1, Div. A., that the Council would, in future, exempt that society from the examination of its stock by the veterinary-surgeons, cannot be granted.

Provincial Competition of Agricultural Merit.

REPORT OF THE JUDGES.

No. 21.—LOUIS PATRIE

The farm of Mr. Louis Patrie, of Weedon, Wolfe, No. 1, comprises 150 acres, 50 acres arable, 15 in permanent pasture, 40 in bush, and 1 1/2 in orchard.

The rotation followed by Mr. Patrie is a good one: First year, after *le friche* (waste) oats, wheat, barley, buckwheat, potatoes, maize with dung ploughed in. Second year, he sows the same grain, with grass-seeds, but he does not put the same grain after the same grain, but varies it (1); except in the case of maize, which he sows near his silo, and manures the land for it again. He leaves the meadows 2 years for hay and 2 years for pasture.

The division of the farm is perfect, and the fences are good.

Meadows and pastures good, and free from weeds.

House good, and well suited to the wants of the family.

The barn, cowhouse, stable, sheep-shed and piggery, a splendid silo, well filled and near the cattle, are all in good condition.

The implements are sufficient in number. We remarked, a threshing-machine, a circular-saw, and a grain-mill, driven by a large inclined wheel: all these work well. M. Patrie himself made and set up these machines, except the grain-mill, by Vessot, of Joliette, which M. Patrie paid \$60.00 for. He has also a "Manure-spreader," which he finds very useful and very economical in manuring his land. M. Patrie was very poor when he began; he has raised a large family; he lives on the produce of his little farm—he cleared it himself—and he still finds means to set an example of progressive improvement to many farmers who have been more favoured by fortune. All the time we were with him, he never stopped talking about farming; he liked to get information from the judges about many things.

Preservation and increase of manure, perfect: full marks allowed.

General management and order good. M. Patrie keeps no books. As to

(1) i. e. we suppose, he does not sow wheat after wheat, but wheat after barley or after oats, &c. Ed.

permanent improvements, he has carted off about 1,000 loads of stones, and put them into waste corners. Ditches in good order. From 530 maples, he made 900 lbs of sugar. Besides the farm-manure, he has used this year 1,000 lbs. of superphosphate.

We found on the farm: 3 arpents in wheat, 1 in mixture of oats and barley, 14 in oats, 1/6 in flax, 2 in potatoes, 2 in silage-corn, 12 in meadow, 29 in pasture, 1/2 in green-meat, 1/2 in orchard, and a garden of 50 feet square. (1).

We gave M. Patrie 81.80 marks, which entitles him to a bronze medal and a diploma of Great Merit.

No. 22.—CHARLES OUELLET.

On the 24th of August last, we inspected the farm of M. Charles Ouellet, of the Parish and County of Bonaventure. It contains 400 arpents, of which 375 are arable, 25 in bush, 3 in orchard, and a garden of 25 feet square. The soil is partly clay, partly sandy.

The system followed by M. Ouellet is: First year, wheat, barley, oats, *goudriole* of pease and oats, and of pease and wheat. Second year, he sows the same grain, but changes the place. Third year, he puts 5 or 6 arpents in barley, with interred dung, and grass-seeds, and oats with grass-seeds. He top-dresses, with dung, the young meadows, immediately after hay-harvest, where there was no dung with the oats, about 6 arpents. He mows 4 or 5 years, and pastures 4 or 5 years. Besides this, he plants 3 arpents in potatoes with ploughed in dung and follows them with wheat. Mr. Ouellet's system is not perfect, as he uses his dung as top-dressing over too large a surface of his land. On this account, he has lost half a point, for there is no doubt about dung so treated losing some of its fertilising constituents.

The division of the farm is good. The fields are in good order and there are no weeds.

Nothing left to desire in the farm-house. Barns, stables, cowhouse, sheep-shed and piggery, grain and cart-shed, are all well adapted to the needs of the farm.

The implements are nearly sufficient in number, but we have taken off one mark as regards the preservation and increase of manures.

The order and regularity of the management are hardly complete.

Mr. Ouellet keeps no books; we gave him half a mark for his "memory-notes." Permanent improvements satisfactory enough, as will be seen by the number of marks assigned.

As to stock, M. Ouellet has: 3 brood-mares, 4 working-horses, 2 2-year-old; 1 yearling bull, 15 milch-cows, 6 2-year-old beasts, 5 calves; 1 Leicester ram, 28 Cots-wold ewes, and 34 lambs.

The crop: 25 arpents of wheat, 3 of barley, 60 of oats, 1 of rye and pease, 2 of seed-timothy, 1/2 of flax, 1/2 of beans, 1/2 of cabbage, 1/2 of tobacco, 3 of potatoes, 60 in meadow, 85 in pasture, 3 of wheat, and a garden of 60 x 25 feet. We gave him 81.75 marks, which entitles him to a bronze medal and a diploma of Great Merit.

No. 23.—ELZÉAR AND THOMAS HUDON.

The farm of M.M. Elzéar and Thomas Hudon we visited on August the 22nd. It is situated at Ste-Anne de la Pocatière, County of Kamouraska, and contains 60 arpents, of which 61 are arable, 4 unploughable, 1 in bush, 1/2 in orchard, with a garden of 50 x 50 feet

(1) Acres and arpents are, again, not the same thing. In the statement of the contents of the farmer of M. Patrie, it is said to comprise 65 1/2 acres, in the paragraph preceding note, there are said to be in all 62 1/2 arpents. Now 65 1/2 acres are equal to 77 arpents, all told. Ed.

The soil is very rich, and offers the best of opportunities for the observance of a uniform rotation over the whole of the land. M.M. Hudon's rotation is good: First year, wheat, oats. Second year, a mixture of oats, wheat, and pease, with grass-seeds, and dung buried by means of the disc-harrow (*herse à bêche*); hoed-crops, dunged in the drills. Third year, where the roots were the previous year, wheat with a half-dunging, worked in with the disc-harrow. The meadow is mown 6 or 8 years, and fed 3 years. The division of the farm is good.

No weeds in the meadows or pastures. The farm-house is well suited to the needs of the family. Barn, stable, cowhouse, sheep-shed and piggery, are still of the old style, but the M.M. Hudon are making great improvements in the buildings. While we were there, a great deal of work was being done to them.

The implements are sufficient, good in quality and kept in good order.

General order good and methodical. Book-keeping was not complete, no inventory of implements, or of stock; we only allowed 2 marks out of 3 for this item.

The M.M. Hudon have made a great many permanent improvements during the last three years, and intend to continue them. In 1891, their receipts were \$850.00, and their expenditure \$75.24 leaving a profit of \$774.76; but in this are included \$80.00 commission on the sales of implements, and \$250, the value of the permanent improvements made during the year (1).

The live-stock is good: one brood-mare, 2 work-horses, 1 yearling colt; 10 milch-cows, Canadian-crosses, 1 2-year-old beast, 2 lambs.

The crops were: 5 arpents of wheat, 1/2 of barley, 11 of oats, 1/2 of pease, 1/2 of seed-timothy, 1/2 of maize and turnips, 1 of potatoes, 11 in meadow, 25 in pasture, 1/2 of green-meat, and a garden of 60 x 50 feet. The M.M. Hudon obtained 81.45 marks, and are thus entitled to a bronze medal and a diploma of Great Merit.

ELZÉAR AND THOMAS HUDON.

INDEX AND DESCRIPTION OF THE PLAN OF THEIR FARM.

No. of the plan	Description	Superficies Total			
		Arpents	Perches	Arpents	Perches
1	Pasture	1	—	1	—
2	"	1	—	1	—
3	"	1	—	1	—
4	"	1	—	1	—
5	"	1	—	1	—
6	"	1	—	1	—
7	"	1	—	1	—
8	"	1	—	1	—
9	Permanent pasture	1	50	1	50
10	"	1	50	1	50
11	Red clover	2	—	2	—
12	Meadow	1	75	1	75
13	"	1	25	1	25
14	"	3	—	3	—
15	"	3	50	3	50
16	"	1	50	1	50
17	"	3	—	3	—
18	"	3	—	3	—
19	"	3	—	3	—
20	"	3	—	3	—
21	"	3	—	3	—
22	"	3	—	3	—
23	"	3	—	3	—
24	"	3	—	3	—
25	"	3	—	3	—
26	"	3	—	3	—
27	"	3	—	3	—
28	"	3	—	3	—
29	"	3	—	3	—
30	"	3	—	3	—
31	"	3	—	3	—
32	"	3	—	3	—
33	"	3	—	3	—
34	"	3	—	3	—
35	"	3	—	3	—
36	"	3	—	3	—
37	"	3	—	3	—
38	"	3	—	3	—
39	"	3	—	3	—
40	"	3	—	3	—
41	"	3	—	3	—
42	"	3	—	3	—
43	"	3	—	3	—
44	"	3	—	3	—
45	"	3	—	3	—
46	"	3	—	3	—
47	"	3	—	3	—
48	"	3	—	3	—
49	"	3	—	3	—
50	"	3	—	3	—
51	"	3	—	3	—
52	"	3	—	3	—
53	"	3	—	3	—
54	"	3	—	3	—
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56	"	3	—	3	—
57	"	3	—	3	—
58	"	3	—	3	—
59	"	3	—	3	—
60	"	3	—	3	—
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62	"	3	—	3	—
63	"	3	—	3	—
64	"	3	—	3	—
65	"	3	—	3	—
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67	"	3	—	3	—
68	"	3	—	3	—
69	"	3	—	3	—
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72	"	3	—	3	—
73	"	3	—	3	—
74	"	3	—	3	—
75	"	3	—	3	—
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78	"	3	—	3	—
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89	"	3	—	3	—
90	"	3	—	3	—
91	"	3	—	3	—
92	"	3	—	3	—
93	"	3	—	3	—
94	"	3	—	3	—
95	"	3	—	3	—
96	"	3	—	3	—
97	"	3	—	3	—
98	"	3	—	3	—
99	"	3	—	3	—
100	"	3	—	3	—

(1) Before calculating on this profit, it would be well to know what the *rent* of the farms, or, which is the same thing, what is

No. 24.—JOSEPH VIGNEAU.

On the 24th August 1892, we went over the farm of Mr. Joseph Vigneau, at Ste-Sophie, Megantic County. The farm contains 110 arpents (= 93 acres), 60 of which are arable, 40 in bush, an orchard of 2 arpents, and 8 arpents unploughable; the soil is heavy loam (*terre-grise*) with a porous subsoil. He is an excellent farmer, is Mr. Vigneau; he cleared the farm he now occupies, and in spite of all the difficulties he had to surmount when beginning, he has brought it to a pretty fair state of cultivation.

The system of rotation is perfect: First year, wheat, oats, buckwheat. Second year, potatoes and other hoed crops, with ploughed in dung. Third year, wheat, oats with grass-seeds, in the proportion of 2 gals. of timothy, and 6 lbs. of red-clover and Alsike mixed properly. The hay stands 2 to 4 years, and is then pastured for 2 years.

The division of the farm is very good indeed. The road to the church runs alongside of his farm, and communicates with his fields.

The fences are good and the fields are exempt from weeds. The house is not well ventilated, but, as regards order and economy, it is well arranged.

Barn, cowhouse, stable, sheep-shed and piggery, the wood- and cart-sheds, are all very handy, economical, and suited to the needs of the farm. Here is also a capital silo, which M. Vigneau highly appreciates.

The implements are good, and sufficient for the wants of the farm.

Preservation and increase of manure perfect; full marks for this item. Full marks, too, for regularity and order. Book-keeping not perfect; we only allow 0.70 out of the maximum of 3 marks for this.

By the number of marks given for permanent improvements, it will be seen that we thought them satisfactory.

Stock: 1 work-horse, 2 2-yr-olds, and a foal; 1 pedigreed Ayrshire bull, 7 cows, 1 2-yr-old fattening beast, 1 2-yr-old beast, 1 calf; 1 registered Shropshire ram, 10 cross-bred yearling ewes.

Crops: 2 acres (or arpents? Ed.) of wheat, 6 of oats, 1 of buckwheat, 1/2 of turnips, 1 1/2 of potatoes, 1/2 maize to ripen, 1 1/2 of silage-maize, 20 in meadow, 26 in pasture, 1/2 of green-meat, and 2 in orchard.

The number of marks allowed to M. Vigneau, 81.35, entitles him to a bronze medal and a diploma of Great Merit.

No. 25.—JOSEPH CHÉNARD.

On September the 3rd, we found ourselves at the farm of M. Joseph Chénard, of Ste-Cécile, Bic, Rimouski County. The farm contains 330 arpents, 200 arable, 40 unploughable, 90 in bush, and a garden 50 feet square; the soil is partly alluvial, partly sandy, and in part clay. Every advantage for an excellent agricultural exhibition, as regards both its dimensions and the quality of the soil, is offered by this farm.

The system of rotation followed by M. Chénard is defective, and we have deducted 2 1/2 marks from him because he sows grain after grain, he does not manure all the land he ploughs, and because he generally uses most of his dung as top-dressing. His rotation is this: First year, wheat, oats, pease. Second year, *gabourage* of pease and oats after oats; he sows wheat with grass-seeds and dung ploughed in on one part, and the rest of the dung he uses

the interest on the money the farm cost, and on the value of the stock, live and dead. Ed.

as top-dressing in spring, or in the following fall. Meadows, 3 to 6 years in hay and 2 to 6 years in pas ure. Potatoes he plants 2 years running in the same place, followed by wheat with seeds.

The division of this farm is not perfect; we gave M. Chénard 1½ marks out of 2 for this item.

The fences are good and there are no weeds in the fields. The house too is well built but not well arranged.

The barns, stable, cowhouses, sheep-shed, cart-lodge, etc. are sufficient for the farm, but, as the implements are

4 calves; 1 ram, 18 ewes, and 14 lambs. Crops: 15 arpents of wheat, 5 of barley, 40 of oats, 6 of pease, 8 of goudriole, 6 of potatoes, 75 in meadow, 60 in pasture, and a garden, 50 x 50 feet.

M. Chénard gets 81.30 marks, entitling him to a bronze medal and a diploma of Great Merit

No. 26 — JAMES YEO.

We visited the farm of Mr. James Yeo, of Rivière du Loup station, Temiscouata, on the 31st of August. It contains 160 arpents, of which there are

chiefly to those who possess farms that are laid waste, or that have been worn out by an improper course of cropping.

Rotation: First year, dung ploughed in in the fall, cross-ploughed in spring, sown to oats or pease. Third year, potatoes, turnips and other roots, with dung ploughed in. Fourth year, wheat, barley, with grass-seeds and a light manuring. The hay is allowed to stand as long as it yields well, and is then pastured for 2 or 3 years. With this system, Mr. Yeo has already restored the fertility of the soil, and as he as yet has not much stock, he supplies people in the town with straw, the dung to be returned being thus free from weed-seeds. (?)

The division of the farm is good, and the fences perfect.

No weeds in the meadows, pastures, or hoed-crops.

No house can be more perfect in every respect than Mr. Yeo's.

The barn, stable, cowhouse, pig-gery, wood- and cart-sheds are most convenient and fitted to the needs of the farm.

The agricultural implements are sufficient in number and kept in good order. The manure is carefully preserved, and regularity reigns everywhere.

We only allowed Mr. Yeo 1.50 out of 3 marks for accounts, as they were not complete.

It is only 3 years since Mr. Yeo bought the farm, and he has already made many permanent improvements such as stone-clearing, ditching, leveling, "mendments" added to the soil, green-manuring, artificial manuring, the planting of forest-trees, mending roads, &c.

Stock not numerous: 1 thoroughbred brood-mare, 2 work-horses, 2 Hereford cows short horn, and a calf.

Crops: 7 arpents of wheat, ½ Gold-thorpe barley, 17 of oats, 3 of pease, 1/8 of beans, 1/4 of sugar beets, 1/2 of swedes, 1/4 of carrots, 3 of potatoes, 1/4 of maize to ripen, 13 in meadow, 30 in pasture, and a garden of 300 x 100 feet.

Mr. Yeo is awarded 80.80 marks, and will therefore receive a bronze medal and a diploma of Great Merit. —From the French.

The Quebec Farmers' Congress.

The above meeting took place on January 24th, and two following days. Very successful on the whole, and above all things thoroughly practical—as it ought to be. It is said, by the papers, that, out of 200 delegates present, the region round Lake St. John sent 125!

Mr. Davies, of Toronto, sent an essay on breeding swine, showing how infinitely preferable was the pork of Canada, fed on mixed grain, skim-milk, and whey, to the pork of the United-States fed entirely on maize. By the bye, Professor Robertson recommends frozen wheat for pig food! Is there such a quantity of it disposable for this purpose, or does he mean that if a farmer is unfortunate enough to have his wheat-crop injured by the frost, it will pay him better to give it to his hogs than to send it to market? The latter I hope is what the professor aims at.

Mr. Ayer, the Montreal dealer in dairy-produce, spoke of the necessity of looking more carefully after the tubs in which butter is packed, and after the cheese-boxes.

Dr Couture, V. S., in the "Live-stock Section," read a paper on the Canadian horse, urging that means should be taken to perpetuate the purity of the breed. Prof. Robertson said that the establishment of the Dairy-school at St. Hyacinthe was the

best thing, Monsieur Beaubien had done.

Mr. Ayer stated that: "Everything wanted to be better. We want better cows, better farms, better pastures, better feed and more of it, better milk, Babcock-tester, better factories lathed and plastered, and neither too hot in summer nor too cold in winter: with clean water, better makers, more education and more commonsense. We want makers who can at once detect inferior, lowered milk, and who, having detected it, have pluck enough to refuse it regardless of consequences."

Mr. H. S. Foster, of Knowlton, seconded Mr. Ayer in his attack upon the inferior butter-tubs and cheese-boxes in which goods are packed for exportation.

Monsieur Chapais offered a resolution setting forth the special advantages of the French-Canadian cow for dairy purposes in this country, and expressing a hope that the Commissioners to the Chicago Exhibition would show there a herd of these cattle. The resolution was carried unanimously.

The dairy-section alone met on the morning of the 25th, as most of the members had gone to visit the new syndicate farm at L'Ange Gardien, near Quebec.

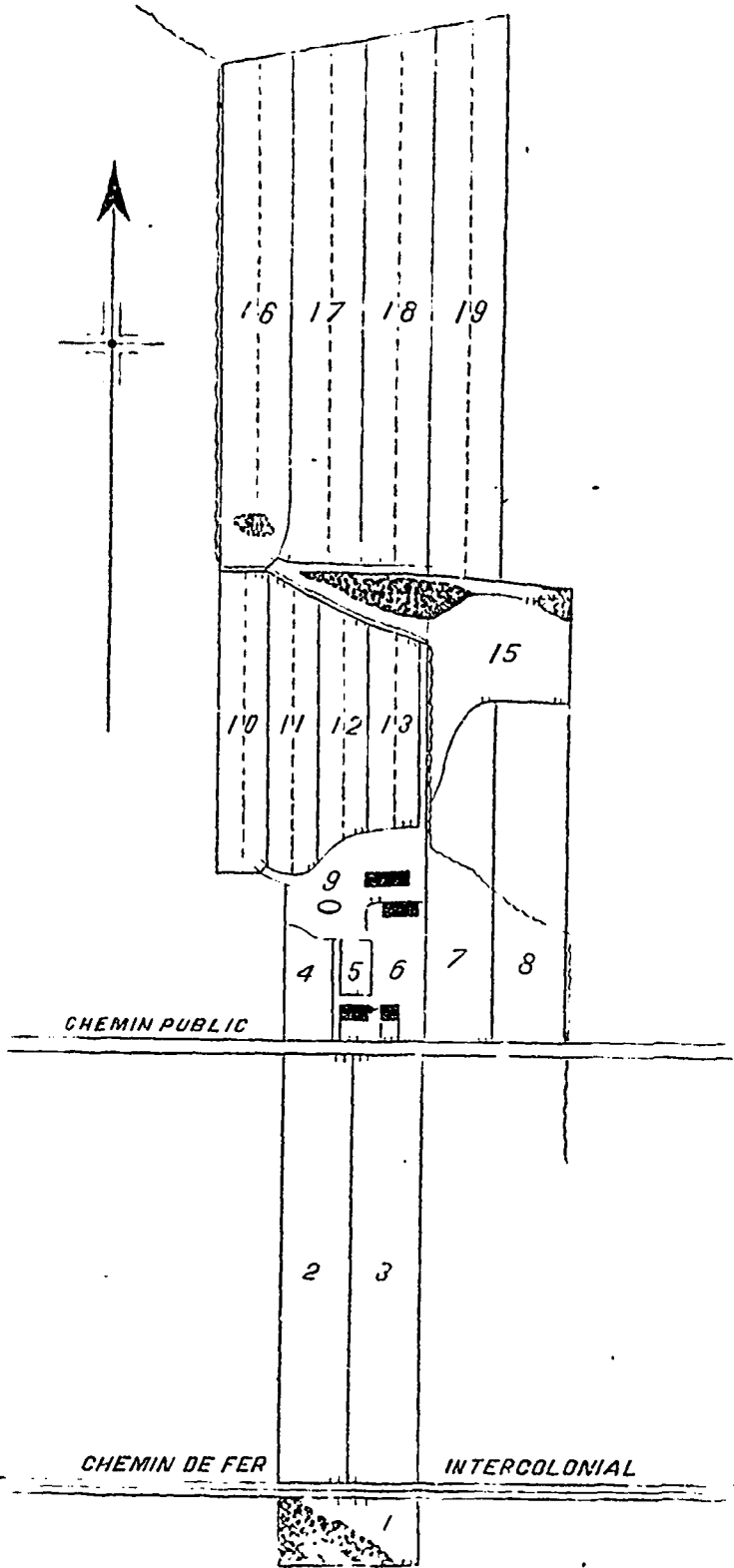
A general desire seems to have been expressed at the meeting that each district in the province should come under the control of a syndicate, untold good having been already done by those most useful institutions.

According to the Montreal Star of the 25th, "much earnestness prevailed at this part of the meeting (i. e. the nomination of the officers of the Congress), showing that the English-speaking members especially were not fully satisfied with the nomination of so many clergymen and professional men. They wanted farmers, practical men, free from ecclesiastical or other authority."

Professor Robertson spoke in the highest terms of a ration composed of a mixture of maize-silage, Russian sunflower-seed and horse-beans. Nothing can be better, in our opinion, than this ration, as the oil of the sunflower-seed will answer the same end as the oil of our favorite, linseed; and, from what was said, the yield of the sunflower seems to be much greater than the yield of the flax-plant.

Mrs. Jones, the celebrated breeder of Jerseys, read a very sensible practical paper on Dairying for profit, in which among other things, she said: My cows produce from 250 lbs. to 500 lbs. and upwards of butter a year. The average cow of the country makes one hundred and fifty pounds. We must get rid of our inferior cows; I do not extol one breed more than another, for circumstances alter cows, and it is folly to disparage one noble breed of cattle because you happen to prefer another. The French Canadian cattle are one of the grandest and most profitable breeds in the world. I was surprised and delighted when I was shown M. Dionne's herd at St. Thérèse de Blainville.

"Winter-dairying," continued Mrs. Jones, "should be the rule, not the exception. Make the bulk of your butter in winter if you wish to average a larger quantity, a better price and a higher profit, also better cows and more and better manure. You will secure a more even distribution of your labor, so it won't be all a famine. Sometimes for half the winter the teams are comparatively idle and the men have time to sit around the village store. Now, I like their having a little leisure and sitting round the stove and exchanging ideas, but not to



FARM OF ELZEAR HUDON AND BROTHER. ST. ANNE, KAMOURASKA, P.Q.

insufficient, we have deducted 1 mark from this item.

Preservation of dung and its increase perfect: full marks for these. Besides the dung made on the farm, M. Chénard used six cart-loads of pease, bran.

The systematic arrangement of the buildings, implements, and fields is by no means perfect, and no books are kept.

The number of marks allowed for permanent improvements show that they are satisfactory.

Stock: 6 work-horses: 1 bull, 18 cows, 10 fattening beasts, 4 young beasts,

80 arable, 80 in bush, 1/4 in orchard, and a garden of 300 x 100 feet. Mr. Yeo came to the country when the Grand Trunk was a building, and has always been employed on the road. Now, he is road-master on the Intercolonial at Rivière du Loup. Wishing to bring up one of his sons as a farmer, he bought, 3 years ago, a farm near the Rivière du Loup station. Fortunately, for the example it was to be to the neighbouring farmers, the farm he bought was ruined: there were no buildings on it nor any implements. Mr. Yeo had to adopt a system which will be a precious example to his neighbours, espe-

carry it too far. You can milk the cows and take the milk to the factory in winter and still have time for reading, recreation and social intercourse. The cow that calves in September will yield well all the winter, when grass comes, it will send her along again for a while, and when she does fail it will be in July and August, just when you are heated and tired with haying and harvest and do not want to be bothered with her, just when the cow is tired and hot and worried with flies and only wants to stand in the shade and switch her tail, and just when butter brings the lowest price in the whole year. I hold that the same cow is worth ten dollars more a year if she calves in September than if she calves in April."

## The Horses.

### The Horse's Hoof

By DR. GEORGE FLEMING, C. B.

The horse's foot is perhaps the most interesting, as it is certainly one of the most important parts of that animal's body, and well merits all the attention and admiration which have been bestowed on it by anatomists and physiologists, as well as by skilled horsemen, for now a very long period. Wonderfully constructed to meet every requirement when the horse is in a free and natural condition, it is yet more astonishingly adapted to sustain the varied and extraordinary demands it has to encounter, in what may be considered the very artificial existence the animal leads under domestication. The foot of no other creature with which I am acquainted is so severely taxed and tested as is that of the horse, for no other foot could withstand the amount of strain and wear that is exacted from it while this excellent quadruped is being utilised by man. It must be confessed that the value of the horse to man, and is chiefly due to the structure and arrangement of its foot. In this organ we find combined lightness with strength, elasticity with sufficient rigidity, and amplitude with elegance in form, while durability is ensured by density and toughness in texture. Of all the domesticated animals the horse has played by far the largest part in promoting civilisation; and it could not have done this had it not been provided with a solid, but elastic and marvellously resisting foot.

The solidity of the foot is due to its being undivided—a condition which, certainly, would render it of limited use, because predisposing it and the other parts of the limb to shock and jar, as well as limiting its movement, but this is obviated by the intervention of an elastic apparatus in the highest degree effective.

The core or basis of the foot is the so-called "coffin bone," which forms nearly three fourths of its volume—for it must be remembered that the horse's foot is quite unlike the human foot, as the animal walks on what would be the extremity of our middle toe (for the hind-foot), or the tip of our middle finger (for the fore-foot). This foot bone, while being very porous to make it light and allow the passage of many blood vessels through it, is yet composed of very dense and tough tissue, so that it is rarely fractured, it is high and somewhat pyramidal in shape in front, as well as circular its extremities being low and thin, so that when looked at from the bottom or ground face, it appears like a crescent, the large space between the branches or horns being occupied by a great mass of fat and fibrous tissue which rests on the horny frog, resem-

bles it in form, and is called the "plantar cushion." This is one of the most important portions of the elastic apparatus of the horse's foot, and is analogous to the pad on the foot of the dog, cat, camel, elephant, &c. Not only does it act as a cushion in preventing concussion, and rendering progression easy and elastic, but it greatly assists the deep flexor tendon of the foot (and which is inserted into the pedal or coffin bone immediately above the cushion) in its important function of bending the lower part of the limb—a task aided by the presence of the navicular bone, over which this tendon plays. In order to yield its full benefit as a cushion, this elastic pad should come into contact with the ground below, through the medium of the horny frog—a circumstance not to be overlooked in connection with the management of the horse's foot and shoeing.

A continuation of this cushion passes round the upper part of the pedal bone, and is named, from its position, the "coronary cushion," it forms a kind of cornice, and lies in a shallow groove or recess in the upper and inner surface of the wall of the hoof. On each side of the pedal bone is a large white plate of elastic cartilage—the "lateral cartilages," which rise above the hoof, and are related to the plantar cushion. These three portions form the elastic apparatus of the horse's foot, and amply compensate for the absence of toes. The coronary cushion receives the first impact of the horse's weight when the foot is placed on the ground, this impact, greatly increased, is thrown back on the plantar cushion, which, pressed upon by the horny frog when the latter reaches the ground, ascends between the wings of the pedal bone, against the deep flexor tendon and navicular bone, and in doing so bulges on each side, pressing out the lateral cartilages. By this series of springs is the marvellous elasticity of the horse's foot secured, without its strength and rigidity being in any way impaired. This really constitutes what has been termed the "expansion" of this organ, but it is an expansion that does not take place laterally towards the heels of the hoof, at its ground surface, but at the upper part, in the region of the lateral cartilages.

The bones, tendons, ligaments, and vascular and nerve tissues of the foot are all contained within the horny box—the "hoof," or "horn-shoe," as the Germans prefer to call it. This is something akin to the human finger or toe nail, but it envelops the whole of the organ, and its structure and form are of great moment when we consider the utility of the horse.

The hoof is composed of a mass of microscopical horny cells, arranged in a definite manner with a view to strength, durability, lightness, and elasticity. The hoof-horn is fibrous in structure, the cells being arranged in a vertical concentric manner round the fibres, these being firmly bound together by the arrangement of the cells in a horizontal fashion, and not by a special cement, as is so often stated. The hoof is divided into wall, sole and frog, and the fibres of these are secreted by minute vascular projections, like the pile of velvet, which arise from the surface of the living membrane covering the coronary and plantar cushions and the sole of the pedal bone. These "villi," as they are called, can be well seen when the foot from which the hoof has been carefully removed is floated in water. The horny cells they secrete differ in quality, those of the wall being very much harder and stronger than those

of the sole, while those of the frog are soft and tough, the further the cells are from the secreting surface, the denser and firmer they become. There is also a difference in their mode of growth, the fibres of the wall grow to an indefinite length, while those of the sole and frog become dry and break off when they have attained a certain distance from the secreting membrane. I have seen hoofs which had belonged to horses that, from an accident, could not put one of their legs to the ground, and owing to neglect in shoeing the hoof of that limb at proper intervals, the wall had grown to an extraordinary length, curling round like a ram's horn, while the sole and frog, having spontaneously flaked off, remained at their normal thickness.

So far as wear is concerned, the wall sustains—and was intended by Nature to sustain—the largest share; hence its mode of growth, its density, and its hardness. Nearly all the attrition and the strain that fall on the hoof during progression are borne by the wall, chiefly at its anterior part; and there it is thickest and strongest. But it must not be forgotten that the sole and frog share with it in weight-bearing, and when the horse is in a natural state they, of course, come in contact with the ground; indeed, it is most essential, both for the safety of the horse and the maintenance of its foot in a healthy condition, that the frog should rest on the ground. I know of no domestic quadruped whose sole was not intended to support weight. In order to enable the wall to withstand the strain imposed upon it, it is firmly attached to the pedal bone by a large number of horny leaves (between six and seven hundred) on its inner surface, which interlock with a like number of flesh-like leaves, formed by the membrane covering the bone being raised in a kind of plaits. The firmness of this attachment is increased by the way in which the wall bends acutely round to the inner side of the wings of this bone, where it is still provided with laminae or leaves. These inflections form what horsemen and horse shoers term the "bars," and this arrangement of the wall around the wings of the pedal bone is one of the strongest arguments against the imaginary expansion of the heels; because these wings, being inelastic, it is evident the wall would be torn from them, or the living tissue between bone and wall would be seriously compressed, if the hoof alternately widened and contracted at the heels.

I have mentioned that the horn of the sole is much softer than that of the wall; and I have now to remark that the union between the two is effected in a very satisfactory manner by means of a thin band of still softer horn. This can be seen when the hoof is being prepared for the shoe, as a narrow, light-coloured line passing around between sole and wall and described as the white line; this is secreted by little processes or villi, at the end of the vascular laminae covering the front and sides of the pedal bone, and but for its presence, there would be danger of fracture or dislocation of the sole at its junction with the wall.

The horny frog is simply a reduplication of the plantar cushion, which lies upon it, and supplements the function of that elastic mass; its horn is in texture somewhat like india-rubber, but it is more easily cut than that substance. It is evidently intended to support weight, diminish concussion, assist the powerful flexor tendon in flexing the foot, and by its shape and consistency aid in preventing slipping, in which latter function it is

aided to some extent, especially on soft or sandy soil, by the bars. When it is not allowed to perform its functions, it becomes soft and shrivelled, sometimes diseased (as from "thrush"), and when mutilated by the shoer's knife in addition, this result is all the more speedily manifested. But when allowed to meet the ground, and preserved from artistic carving, it remains large and sound, and is in texture like a piece of vulcanised rubber. Therefore, it should not be interfered with by the shoer, unless it be to remove semi-detached flakes—never on any account ought the solid horn to be incised. The same remark applies to the sole, exfoliating portions may be taken off, but the firm horn should not be touched; indeed for years, so anxious have I been to keep the hoof in a strong and natural condition, that I would not have the flakes removed, but allowed them to fall off, as I considered them useful in protecting the sole itself from injury by stones, &c., and also in retaining a certain amount of moisture to keep the horn above them soft and elastic.

With regard to the wall, however, the case is different. This, as I have already said, was intended to sustain wear, and therefore its growth is unlimited; but when the hoof is protected by an iron shoe this wear cannot take place, and the hoof consequently becomes inconveniently long, causing the horse to trip and stumble, straining tendons and ligaments, and making the animal's action uncomfortable. This inconvenient growth sometimes occurs, even with unshod horses which are running on soft pastures, or in well littered sheds. The shoer, by means of his rasp, to reduce the wall to its normal length, and in doing this properly—and not in defacing nature by carving and rasping away the protecting horn—he has ample opportunity for displaying his skill. It needs an artistic eye to reduce the wall of the hoof to proper and symmetrical form. Not only has the natural length to be reached, and kept in harmony with the portion of limb immediately above the foot (this is tested by looking at leg and foot from the side), but the balance of the leg laterally has also to be secured (this is ascertained by viewing leg and hoof from the front). If the inside of the wall is left higher than the outside—a very frequent occurrence with the shoer—then the leg deviates to the outside, and this causes strain to the ligaments of the joints, pain to these and the limb, and, if persisted in, lameness and premature wearing out. A plummet line dropped from the middle of the knee should fall exactly through the centre of the toe in a well-formed limb, the hoof of which has been properly levelled. Scarcely too much stress can be laid on this subject of reducing and leveling the wall of the hoof.

Hoofs differ much in shape. Every horseman knows, of course, the difference between the hoofs of the fore and hind feet. He is aware that a well-shaped fore-hoof (as in Fig. 1) is almost, if not quite, circular, and a little more expanded on the outer than the inner side with the horse that has never been shod. The hind-hoof is smaller and more oval in shape, the wall more vertical, the sole more concave, and the frog much less in size than in the fore-hoof.

The size of the hoofs depends not only on the treatment they receive at the hands of the shoers, but also upon the climate and nature of the soil. It is not at all uncommon to find what are called "odd-sized" feet belonging to the same horse, these being usually

the fore-feet; and they may be perfectly free from disease, and one foot smaller than the other is often congenital, and this neither predisposes to disease nor is an indication of any morbid condition, unless the animal is lame; or the inequality may be due to the shoo, or to a shoo having been lost.

Large hoofs with prominent frogs and rather flat soles, are generally found in moist countries, narrow small feet, with hard, dry horn, and rather diminutive frogs and concave soles (Fig. 2), are usually observed in dry climates with rocky or sandy soils.

Black hoofs are composed of tougher horn than white ones: and the hoof which has not had the front and sides of the wall rasped by the shoer, or its texture damaged by oil or hoof ointments, is generally smooth and shining. The fibres of the wall become softer as they are deeper, until at last when near the inner surface they are quite soft and pith-like. Hence the great importance of preventing the shoer from touching the front of the wall with his rasp. All he has to do with regard to the hoof, when shoeing it, is to reduce it properly, then fit a shoo to the size of the circumference

## The Farm.

### On the Preparation of Land for Hoed-crops.

A thoroughly practical farmer in England being asked the other day what was the best manure for the root-crop, replied: good tillage.

What he meant to say was, that successful root-growing depends, not so much upon the use of such or such a fertiliser, as upon a finely pulverised, moist seed-bed produced on land in good condition from previous good farming. Not that the man in question had any doubts as to the beneficial effects of superphosphate, &c., but his long experience had taught him that it was but too often that the bad state of the land on which they were cast, in great measure invalidated their powers of action; whereas, when the soil had been brought into proper trim by the timely use of the plough, the harrow, and the grubber, the manure was received into a kindly repository, its elements were gradually freed from their, so to speak, inert condition, their material fostered, and when the moisture and the organic acids had rendered them perfectly soluble, they were appropriated by the tiny radicles of the infant plant

ploughs his land, in the fall, laying it well up in moderately wide ridges, cross-ploughs it, after harrowing, in the spring; drills it up into 24 inch drills; spreads the manure, splits the drills and rolls them down; sows 3½ lbs of swedes to the acre, keeps the horse-hoe going from the moment the first sign of the rows is visible, singles the plants at ten inches, hand-hoes them deeply, and the affair is done.

Well, one of our readers may probably exclaim this is easy enough on loose, kindly soil like the Sorel sand, but my farm is on a heavy clay, how can I manage to reduce the harsh, cloddy surface of such a soil in time for sowing a root crop? It is not impossible or even difficult, we reply, if you will go the right way to work, if you will be patient, and not try to muddle the land about at a season when it had far better be at rest. The seasons are short, there is no denying that, but the same rules for the management of heavy land obtain in this country and under this climate, as obtain in England and in Scotland, as thus:

It will pay you better to lie in bed, or as we used to say at home, to play at skittles or nine-pins, than to touch heavy land when it is in the least "clung." How often have you seen

moisture necessary to start the young germs into life will have evaporated before the advent of seed-time: on heavy land, turning up the raw bottom of the fall-furrow will, in most cases, produce clods that will be found hard to reduce. Therefore, instead of cross-ploughing which would bury the fine surface brought about by the frost, we will do the work with the grubber or cultivator, and pass this invaluable implement over the land twice, along and across. On heavy land, some clods, more or less numerous, will be brought to the surface and these must be pulverised: by the harrow or the roller? Well, our idea is that, after the land has been allowed to remain drying for a few days, the passage of the roller will more surely break down the clods than if the harrow preceded the former implement. Most farmers who observe will have seen that when the harrows have brought clods away from their bed of earth, so that they lie on the very top of the soil, the subsequent passage of the roller over them only kneads them down into the ground again. So we recommend rolling after the grubber and harrowing after the rolling. It will frequently be necessary to repeat all three operations, grubbing, rolling, harrowing, for, as we said at starting, "good tillage is the best manure for hoed-crops."

The land is now, or should be, fit to receive the seed, whether of maize, swedes, mangels or carrots. As all of you who grow hoed-crops are accustomed to sow them on drills, we will take that plan; and, first, what distance apart shall we choose for our drills? In Scotland, where the system was first invented the distance between the drills was necessarily regulated by the construction of the common plough, as, originally, there was no double-mouldboard plough such as those perfect implements we are fortunate enough to possess to-day. Every drill, therefore, had to be made by a *bout* of the common plough, and that implement, as usually constructed, made drills of 28 inches apart more perfectly than those at any other interval. But some *thinker* among the plough-makers hit upon the idea that if the lower side of the mould-boards of the "earthing-up plough," as it was then called, were cut gradually away towards the extremities, it would be able to go deep enough to form a properly shaped drill, or rather to form at each passage two halves of two drills. Hence, by altering the widths of the mouldboards, we are now able to make drills of any desired width apart from 20 inches to 40 inches. A marking bar jointed to the beam, was subsequently added to this implement, which was the only thing wanted to make it complete. In spite of this improved tool, the distance between the drills still remains, in the majority of cases, 27 or 28 inches, whether requisite or not.

What should guide us in the choice of the distance between the drills? To our mind, two things: 1. the space required for the due expansion of the roots and leaves of the crop to be grown; 2. the space required for the passage of the horse-hoe between the rows of roots. It would be absurd to plant champion potatoes, the haulm of which frequently attains a length of from 40 to 50 inches, at the same distance apart as early-roses, the haulm of which is not above half that length.

The difference between 27 inch and 25 inch and 24 inch drills may seem trifling, but when we consider the difference this makes on an acre of roots, its importance becomes apparent.

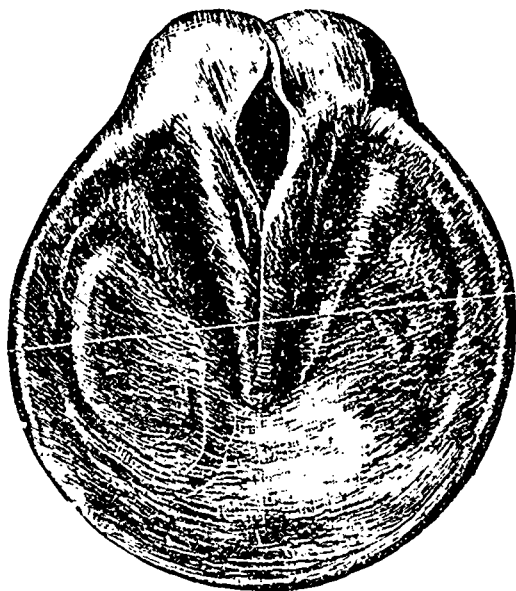


FIG. 1.

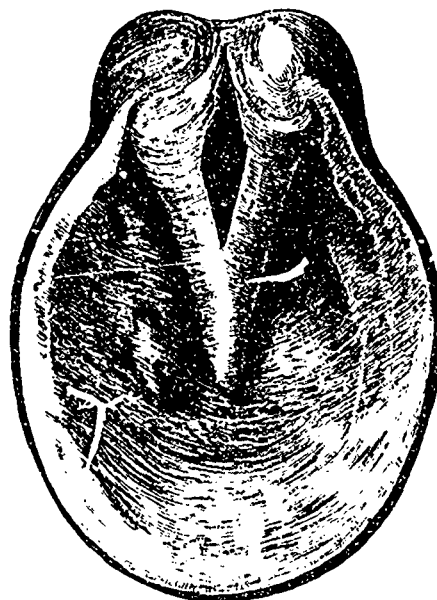


FIG. 2.

of the wall, attach this by as few nails as may be consistent with security, and nothing then remains but to clench or turn down the ends of the nails to the face of the wall. The latter should pass in a straight line from the coronet to the shoo, and not be chopped off in an unsightly, stumpy fashion between the clenches, as is so often the case, because the shoer will make the hoof fit a shoo which is too small.

The art of shoeing is simple enough when properly practised; it is the cruel manner in which the hoofs are only too often mutilated that causes it to be a difficult art, requiring skill to deal with that which ignorance has despoiled. Shoeing need not, should not be a necessary evil; but if properly conducted it ought to confer benefit, and enable horses to live longer and do much more service than if they were not shod. In fact, unshod horses in moist climates and on artificial roads would be of little value to man. The horse's utility and strength are multiplied a hundredfold by the iron rims attached to his feet by the skilful artisan, while his foothold may be rendered much more secure by this appliance.

without more trouble or delay than was absolutely necessary.

Good root-crops are hardly ever seen but in association with good cultivation. Science, properly so called, acknowledges this, but the false science, of which there is so much in the air of the present day, seems to take it for granted that the crop depends entirely upon the use of this or that fertiliser. Were this accurately true, would our friend and pupil, Monsieur Guévremont, succeed in growing such superb crops of swedes as he secures every year on the poor Sorel sand? Not at all; all the manure he employs is derived from his own cattle, not by any means too well fed, and from the stables and cowhouses of the town of Sorel, in which, if the animals are in no worse condition in spring than they were when they went into winter-quarters, the owners are well satisfied; and of this he can only secure enough to be able to afford a very moderate dressing to each acre of the 20 he usually sows with roots.

What then does M. Guévremont do to get such yields off his lands? He does just what every good farmer, in every district of Britain, does: he

when the season was getting on, land of this kind cut up into *slivers*, that, when attacked by the sun, hardened into almost iron-like bands that defied all the powers of the harrow and the roller to disintegrate them!

"I don't hold with fall-ploughing," another will say: neither do we, unless it is done where the land is in fit condition, and unless the furrows are laid up at the proper angle of 45°. A flat furrow, beaten flatter still by the spring rains, is not in proper form to be attacked by the harrows, neither, when the water runs after the ploughman in the path just made by the plough, is that the proper condition in which to work heavy, or, in fact, any land.

And now we will suppose that the land intended for the hoed-crop—be it corn or roots—has been cleaned in the fall and laid up in the early winter in good shape. Spring arrives; the wind and sun have thoroughly dried the surface, and the dust has begun to fly about: what shall our first operation be? Two things are to be guarded against, one on light the other on heavy land. Too much cultivation on the former is apt to render it *deaf*, that is, too mealy, in which case, the



Supposing our plants are to be singled a 12 inches apart in the rows, then:

27 x 12 = 19,300 plants to the acre;  
and 24 x 12 = 21,800 do do

2,500

Now, 2,500 plants, to good, at 3 lbs. a plant besides the tops, are equal to 3½ tons, about 180 bushels which is no trifling gain on an acre labour, rent, and manure remaining the same.

And this, in a degree, will prove true with the potato crop, for 2,500 divided by 2, taking half a pound to be the average yield of each set, gives 1250 lbs., which divided by 60, the numbers of pounds in a bushel is equal to 14 bags, worth in the Montreal market to day \$16,000; and this is, except the additional trouble in harvesting and marketing, clear gain.

For ourselves, we may say that we have tried the system of 24 inch drills over and over again, and are perfectly satisfied that, except for a tall plant like corn, the distance is quite sufficient.

Well, our drills are made: the dung is ready, not far from the place where it will be needed, having been turned over about ten days before seed-time; and the bone dust, superphosphate or other artificials have been properly pulverised and mixed: now, to apply them.

Let the manure be laid down for three drills at each passage of the dung-cart; the horse going at a slow pace. It will be far easier to spread the dung equally over three than over five drills, which is, as far as we have seen, the usual number chosen here. The dung being spread, in as small pieces as possible, sow the artificials as equally as possible over the whole piece, not along the top of the dung, for if some falls on the top of the drills, it will stand a chance of being nearer the roots of the young plants than if the whole is deposited at the bottom of the drill.

This being finished, cover the whole as soon as possible, and sow at once; the great point is to get the seed in before the upper inch of the drill has had the slightest chance to get dry. Never leave a drill unsown when you go home at night, particularly if, as in the case of mangels and carrots, you have steeped the seed. Steeped seed is more likely to *chip* and die than unsteeped seed, but its rapid starting into growth, — *brairding*, the Scotch call it—is so desirable in such slowly sprouting seeds as those cited, that it should always be practised. When mixed with dry sand, the Planet Jr. drill sows steeped seed perfectly. The steeping is simple enough, put the seed, in a bag, in water, remembering that in *running* water it will imbibe as much moisture in 12 hours as it will imbibe in a tub of water in 18 hours, and after, say, 30 hours in steep, hang the bag up to drain in a warm place. When the little white points begin to show themselves at the edge of the seed it is ready for sowing; at any rate, four days should fit it.

Roll the drills with a *light* roller, before and after sowing. In this climate, the land dries up so quickly that every means should be taken to confine the moisture, and the little rolls attached to the hand-drills usually employed here are too light to be of any material use for this purpose.

When the farmer is fortunate enough to possess a regular manure- and seed-drill, he will of course know how to save himself the trouble of hand-sowing the artificials.

Do not spare the seed; 3½ lbs of swede, 5 lbs of mangols, 6 lbs of carrots, is not too much seed for one acre. As to depth of sowing, in this country we must sow a little deeper than in Britain,

from ¾ of an inch to an inch in depth is about safe. Keep the sowing machine carefully in the middle of the rolled drill, so as to preserve a regular distance between the rows of plants.

As soon as the rows begin to show themselves, at that very instant the horse-hoe should go to work. It should not be set too wide at first, but the second and third time of hoeing, it should work close up to the plants, cutting down the sides of the drills: this will make the subsequent singling and hoeing much easier of execution, as, if the horse-hoes curved side hoes have done their work properly, not more than two inches of each row will be left to be done by manual labour. One great cause of expense in singling is thus obviated.

A horse-hoe of proper construction, that is, with the curved side hoes, will be exhibited at the Mile-End Show next September. (1) The implement is so light that a 500 lbs pony can draw it with ease, and yet its power of "sticking to its work" cannot be excelled. It will work at any depth from one inch to five inches—and at any width—from twenty to forty inches. Where stones of any great size are to be met with, what is called in Scotland a "drill-grubber" is more efficient, but in all land free from stones the writer's horse-hoe does what may be called *perfect work*.

*Singling.* Many farmers have begun root-growing without ever having seen the work done properly: consequently, an acre of roots costs them about three times as much as it ought to cost. As this *singling* is evidently the cause of the abnormal expense, it would be well for all intending root-growers to study the question thoroughly.

Now, in Britain, where swedes, mangels, &c. have been grown on a large scale for more than a century, the *average cost* of singling an acre of roots may be fairly set down at 4 shillings = \$1.00; but, then, it must be remembered on most arable farms—always excepting the heavy clays—about ¼ of the whole is in roots every year: so the men get thoroughly accustomed to the work, and, as it is invariably paid for "by the job," they look forward to root-hoeing as a kind of harvest-work.

A good singler uses his hoe alone: he never stoops to single with his fingers. Standing straight across the rows, at right-angles to the one he is going to attack, he cuts out his plants with an eye that practice has made unerring; perhaps, he gives a light push, perhaps, a draw to his tool; he drives it in deeply; pulling down the drill as level as before it was made, and leaving the best plant of the ten or twelve inches lying on its side, in such a condition that a novice would imagine it would die in an hour. In fact, we have often been told that: "you have killed all the plants." Next morning however, they were all stiff, healthy, and vigorous.

Thus, the land is completely stirred from one side of the piece to the other, the horse-hoe having left two, or at most three, inches of the drill untouched, which, as we have just seen, the hand-hoe finishes. Surely, this must be better for the soil than a delicate scraping with the tool. The secondary object of root-growing in the cultivation of the land as a substitute for *fallowing*, and the combined work of the horse- and the hand hoe secure this object if the process is conducted as just described.

But as our people in many districts are not skilled *singlers*, it may be well

(1) Alas! I hear that there will be no show this year. Ed.

to describe the process we recommend to be followed here.

Two hoers, women, with 7 inch hoes, start, each at the end of a row, and chop out, at regular intervals, the plants growing on about 10 inches of drills, leaving bunches of plants about ten or eleven inches apart, which plants being disturbed by the action of the tool, will fall to the ground in a disentangled fashion. Following these hoers, two others, women or children, single the bunches, leaving one, the best, plant of each bunch. The work is easy enough, as the horse-hoe, if properly used, leaves such a trifling width of drill to be cut by the hand-hoe.

As for the cost, Mr. James Drummond, of Petite Côte, Montreal, puts it thus:

Two women chopping..	\$1.20
Two women singling...	1.20
Second hoeing.....	0.60

\$2.00

M. Séraphin Guévremont, of Sorel, who grows on an average 20 acres of root-crops annually, calculates the cost of singling thus:

Two women chopping out..	\$1.20
Two do singling by hand...	1.20

\$2.40

Something more must be allowed for going over the drills a second time with the hand-hoe, but if the horse-hoe is kept going until the leaves begin to "shake-hands" across the rows, an active man can get over a good deal of land in a day.

The writer applied to the editor of the *Agricultural Gazette*, England, for his opinion on this subject. The reply was as follows:

"We know that in Scotland two women will single an acre of swedes in a day. In the south of England, where the distance between the rows is from 18 to 20 inches, 8 shillings = \$1.92—is the price paid for singling and second hoeing. We perfectly agree with Mr. Jenner Past that two women gapping out the rows with a 7-inch hoe, followed by two more women singling the bunches, could finish and acre in one day of ten hours.

In Norfolk, Eng., one of the leading farmers of that highly cultivated county, Mr. Alfred Learner, of Wyndham, says:

"The price given for hoeing roots is 7s. 6d. an acre for *chopping out*, picking (singling the bunches), and hoeing once afterwards."

M. Pierre Guévremont, our pupil, who manages the large farm of his father, Senator Guévremont, at Sorel, told me, in 1887, that the cost of hoeing and singling his root-crop—swedes and mangels—did not exceed \$3.00 an acre. Not one of the hands who did the work had ever seen a piece of roots hoed or singled before. The land was very foul, the manure, taken raw out of the dung-pit, having never been fermented, and being full of weed-seeds. His swedes, that year, certainly yielded 1,200 bushels an acre.

Thus, we must come to the conclusion that roots can be grown in the province of Quebec, if the hoeing and singling are properly conducted, almost as cheaply as in England.

#### CLOVER.

Mr. Terry, a contributor to the *Rural New-Yorker*, who farms without stock of any kind, except one cow and the plough-team, upon being asked: What can be done for land that is *clover-sick*? replies: "Have you any such land?" "No, but I hear of it sometimes," is the retort; "So

do I," rejoins Mr. Terry," but I have never been where it existed. Such land always belongs to some one a long distance away."

In other words, Mr. Terry is absolutely incredulous as to the existence of land that is, for some reason or other, tired of growing clover. Of course there is such land, and we lived for some years in the midst of farms where to attempt the repetition of the clover-crop oftener than once in eight years was utterly useless.

The farmers of the Eastern counties of England know the value of the red-clover as well as any people, and thousands of them found themselves obliged to give up growing it except at long intervals, and Mr. Terry will arrive at the same result if he continues his 3 course rotation wheat, clover, potatoes, many years longer.

#### CLOVER QUESTIONS ASKED AND ANSWERED.

"What shall we do for the pest that eats off the clover plant at its crown?"

"I have had no trouble with it. So far as I have observed, it makes no trouble until the second year of the clover. I turn the plant in and rot it, working it into money at its earliest maturity, and so avoid the worm. Regular rotation will reduce its destructiveness."

"What can be done for land that is clover-sick?"

"Have you any such land?"  
"No, but I hear of it sometimes."  
"So do I, but I have never been where it existed. Such land always belongs to some one a long distance away."

"How much stock do you keep?"

"A single cow and horses necessary to run the farm."  
"If you needed no horses, would it be more profitable for you to keep only one animal on the farm?"

"After years of careful experiment, I have demonstrated that stock farming does not pay me as well as water crops. A ton of steers that would bring \$80 at four cents per pound remove \$11.80 of fertilizing ingredients from the farm when sold; \$80 worth of potatoes take but \$9 worth and make quicker and easier money, besides more of it."

"How early should clover seed be sowed?"

"There is no danger of sowing it too soon in spring, and every danger of loss from too late sowing. Hundreds of bushels of seed are wasted every year by sowing it so late that the frosts cannot work it into the soil before it sprouts. In this case, the tender young plants are frozen because they start before killing frosts cease. Had the seed been sown at Christmas or midwinter, the cracking of the surface would have given Nature's burial to each seed, and none of the plants would have appeared on the surface until well rooted and late enough to be safe."

"I have some sandy loam which I wish to stock with clover. But I desire also to get a crop of grass to cut next summer. Can I sow clover and Hungarian grass or millet together?"

"Not with safety to the clover, unless the accompanying crop is sowed so thinly as to prove unprofitable. Clover must not be crowded and shaded when starting. This is one great cause of the failure of so many with it. Make the land rich and give it up wholly to clover. It will pay handsomely."

"M. Terry how do you succeed in making such a late growth?"

"This is one of my secrets, and an open one. I harrow it when a foot high in the fall before it turns brown. This

retards its ripening, so it keeps green very late, while clover not so treated looks dead."

"Does not the process tangle it so that the plowing under the following spring is difficult?"

"No; because I have learned how. This is a job I attend to myself, and never neglect. I harrow it in lands as it is to be plowed the next spring, and the combing aids the plow."

"What harrow do you prefer?"

"I have tried all of them, and for this work nothing equals the Thomas smoothing harrow."

"Is the roller useful here?"

"I have not found it so," replied Mr. Terry.

"What rules do you follow in raising clover seed?"

"I don't raise it any longer and find that I can buy the best quality of my neighbors."

"Why have you abandoned raising your own clover seed?"

"I find I can get more money from the land in potatoes?"

"What shall we start a rotation of clover, wheat and potatoes with?" asked Charles Haines.

"If the land is poor, sow wheat and put on all the manure you can get, in the fall."—(R. N. Y.) H. S.

**Quotations.**—A London letter to a Montreal paper stated, on the 6th January, 1893, that Manitoba wheat was worth more in the Mark Lane market than any wheat grown in the United States. And, yet, in the report of the English grain-market, in the same paper, the following quotations appear:

No 1 hard Manitoba wheat	30s a quarter = 90 cts a bushel.	London.
No 2 hard Manitoba wheat	28s a quarter = 84 cts a bushel.	
California wheat	95 " a "	Liverpool

And, of course, wheat is dearer in London than in Liverpool by the amount of freight between the two towns.

**Sulphate of ammonia.**—Talking the other day to the Manager of the Montreal gas-works, we asked him what was the present price of sulphate of ammonia. To our astonishment, he replied that there was no price, as the company did not make any; and, on being pressed as to what became of the gas-liquor, he replied: Oh, we condense it, and send it to the States! A nice state of things, indeed! There are, every week, four advertisements in the Country Gentleman of "Canada unbleached wood ashes, for sale by the carload," and now it seems the ammoniacal liquor goes to the same country. Thus, our land is deprived of the three main, in fact, sole valuable constituents of chemical manures: the phosphoric acid and the potash are sent abroad in the wood-ashes, and the nitrogen in the gas liquor.

No one of course dreams of blaming the exporters of these goods. Finding no market for them at home, they naturally looked elsewhere, and succeeded in their quest. But it is a sad look out for a country where the stuff that should supply the wants of the land is sent abroad. We are exporting a marvellous quantity of cheese, and so much the better; but how do we intend to replace the stores of nitrogen, phosphoric acid, and potash this product extracts from the soil, if we continue to allow the raw material to be exported as well as the manufactured goods? An end to this must come some day, and we shall hardly be prepared for it. We have always felt surprise, and expressed our surprise in pretty plain terms, at the difference between the price of manurial consti-

tuents here and in England, but we are no longer surprised at anything but the apathy of the farming class that refuses to accept the services of those good gifts that nature and science, combined, lay at its feet.

**Weeds and Modes of Destroying them**

*Bulletin LXXV. Ontario Agricultural College.*

Messrs Shaw and Zavitz, of the Guelph College, have kindly sent us their bulletin on the above subject, containing 31 pp., and very concisely expressed, wherein it differs from many pamphlets forwarded to us for review.

The Collogo-farm, it appears, was "choke full" of weeds when the cleansing operations were begun, and in three years was brought into a clean condition without the loss of one paying crop, and without resorting to a bare fallow. The only outlay for which there was no direct return was for labour spent in hand-pulling and forking which, in the three years, only amounted to \$250.00.

seasons. On freer soils, this would not succeed.

Let no seeds ripen; look sharply after purchased seeds; clean out the travelling threshing machine; *boi* (not burn) the screenings before giving those to the cattle (*good*); grow as many acres of hoed-crops as possible (*bravo*); all these are recommendations worthy of attention.

On the other hand, Messrs Shaw and Zavitz are strongly opposed to the bare fallow, and to the destroying of the seeds of weeds by the fermentation of farmyard manure, assigning as a reason for the latter objection, that it is the cause of "the loss of much nitrogen in the manure." Some nitrogen is doubtless lost, by turning dung; but, if the heap or mixon is firmly made, a covering of, say, 6 or 8 inches of earth thrown on the top, and not more than ten days allowed between turning and ploughing in the manure, the loss, practically, is far more than repaid by the gain resulting from the destruction of the weed-seeds. And we must not forget that for all root-crops, well made, i. e., fermented dung, is of

during fermentation, with *but little* loss of valuable constituents. Some of the constituents have also become more soluble." p. 26; ed. 1881.

"The effect of farmyard manure is spread over a considerable number of years, its nitrogen being chiefly present not as ammonia, but in the form of carbonaceous compounds." *Ib.* p. 27.

The instructions for getting rid of couch grass are very good; only we prefer breaking up the infested soil with a good grubber like "The Coloman" to using the plough, which implement cuts the roots of the enemy into short lengths whereas the grubber tears them up without cutting, and thereby renders them more easy of collection by the drag-harrow and the horse-rake.

"The following mode of dealing with couch will be found successful, unless in seasons that are unduly moist:

"Plough lightly after harvest, then harrow with the ordinary harrow, and if necessary use the spring tooth cultivator to shake the roots of the grass free from the soil. Then, draw them into light winrows with the horse-rake, and when dry enough burn them. If the weather should not be dry enough for this, the rootstocks can be carted into the compost heap. Repeat the process a second time, and even a third time the same autumn, if the weather will admit of it, ploughing more deeply every time to bring up fresh rootstocks. But in any case do not continue the work in wet weather, else the labor will be lost. When the late autumn arrives, rib the land by turning two furrows together from opposite directions, or plow so that the largest possible amount of surface will be exposed to the action of the frost in winter. The frost has the effect, first, of killing the roots of the exposed portions, and second, of freeing them from the adherent soil. In the spring, use the harrow and cultivator occasionally in time of dry weather, and in case of need also the horse-rake, until it is time to plant corn, roots or rape. Cultivate this hoed crop properly, giving it what hand work may be necessary along the line of the rows, and by the autumn the couch-grass should be all gone, unless the season has been a wet one."

Ribbing, or *raftering*, as it is sometimes called, is not a practice we care to recommend. We tried it, many years ago, in a heavy soil in Kent, Eng., and the land broke up in spring in a very different condition to the remainder of the field, which, in accordance with our old Kentish rule, had been ploughed ten inches deep with a turn-wrest plough drawn by four horses. But, here, in Canada, the sun in August and September is so powerful, that if the autumn-cleaning of the stubbles is begun early enough, the whole of the couch can be eradicated and burnt or carted off before the autumnal rains set in, and then, the fore-winter furrow can be given at its usual depth and there will be no need of "spring-cleaning," a gain of time invaluable in our short seasons.

**Symmers' Patent.**

**HAY AND GRAIN CAPS.**

Many recommendations of these caps have reached us. One of the most sensible remarks we find in the opinions of the press of the U. S. on the subject is that "More hay is injured by bleaching and sun-burning than by rotting. Wherefore, in England, we keep our hay on the move from the moment the dew is off till it begins to fall again in the evening, and put it



COUCH GRASS (*Triticum repens*).

The conclusion derived from the operations is that a hundred acre farm, when once cleaned, may be kept clean, if the general system of cultivation is good, for no larger expenditure in forking and hand pulling than \$250.00 a year.

**Agencies in weed-distribution.**—Wind, birds, floods that carry down seeds, and especially the neglect of cleaning the threshing machine that brings them from our neighbours' farms, on which we have often animadverted, in this periodical; dung from the city and purchased fodder; manure made on the farm itself (*and not turned over*), and neglected corners of the fields and banks of ditches where the weeds are not kept mown down; all these are causes of foulness of land.

Some crops allow the weeds which infect them to ripen: *pigeon-weed* and *wild-flax* ripen their seeds early, as in fall-wheat and hay crops. In such cases, the authors recommend the omission of these crops for a time from the rotation.

The *Canada thistle* can be destroyed in clay-soils with a stiff subsoil, by turning the land into pasture, and mowing them twice a year at certain

great importance, as it pushes the young plant forward when its delicate rootlets would have great difficulty in feeding on raw, unfermented dung. Solubility in this case is a very great factor in successful work, particularly when the fly is troublesome.

That we are not alone in this opinion as to the superior value of fermented dung, the following quotation from "The Chemistry of the Farm," by R. Warington, Fellow of the Chemical Society, one of the "Hand-books of the Farm," edited by late J. Chalmers Morton, Editor of the English Agricultural Gazette, and one of the best practical farmers we ever met. (1)

"Farmyard manure rapidly undergoes fermentation. If placed in a heap, the mass gets sensibly hot, and a large quantity of carbonic acid is given off (*no loss in that*). When the fermentation occurs in a place protected from rain, carbonaceous matter is destroyed (*no loss again*), but little loss of nitrogen takes place. Rotten manure, when well made, is more concentrated than fresh, having diminished in weight

(1) Mr Morton was brought up on Lord Ducie's Example-farm, at Whitfield, Gloucestershire, where we saw a good deal of him in 1848, '49. Ed.

up in cock—small *grass cocks* the first afternoon, and then in larger ones—before nightfall.

Here, where labour is so costly, the same process cannot be gone through and the sooner hay, especially clover hay, can be got into large cocks the better, and if these are covered in with well made caps, the hay will suffer neither from wet nor from sun.

The London, Ont., Farmer's Advocate speaks of these caps as follows:

**HAY CAPS AND CLOVER.**—I have been experimenting this season for the first time with the use of hay caps in making hay and clover, and with most satisfactory results. They are made of pulp, light, easily put on, perfectly waterproof of a saucer shape, and large enough to cover a cock of fifty or a hundred pounds of hay. By their use I have been able not only to save my hay in beautiful order in spite of frequent showers, but also in many cases to carry it from the cock even after a heavy rain without further handling, and I have also found that by cutting Saturdays, capping and capping in the evening, that I have the usual number of loads to bring in on Monday, instead of as heretofore trying to get everything into the barn on Saturday, and either wasting time on Monday, or cutting more than I could properly attend to. With grain I have not yet tried them, but in clover growing I believe their use is destined to serve a most important end, and they overcome the objection that many people make to clover growing, on the score of needing so much handling in curing it.

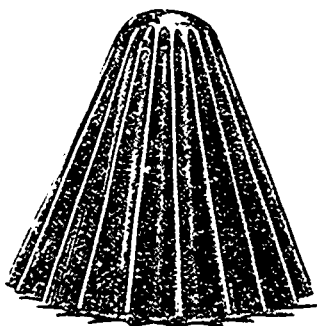
Prof. Henry, Wisconsin Ex Station, "found them very useful in covering not only hay but also plants newly set out."

Mr. Long, New-York, was well pleased with the 800 hay-caps sent him.

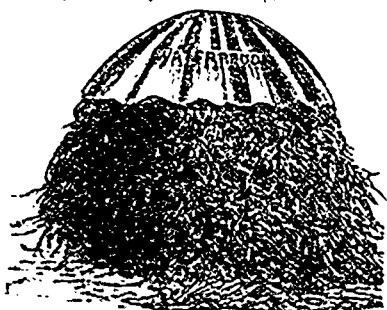
Mr. Whitcomb, Massachusetts, likes the caps very much, if he had taken 500 of them the first of July, he would have saved, in quality of hay, \$100.

We have been informed that many of these caps are ordered for the approaching summer, and we trust that those of our readers who use them will let us know how they find them answer.

A useful Experiment.



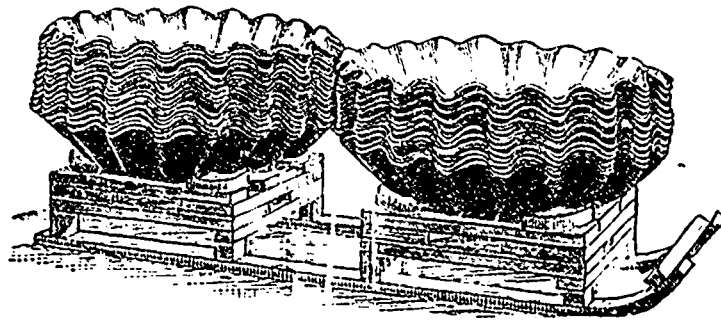
The Symmes haycap Company send me a portrait of the Symmes' Patent Vegetable Cover. It is said to be thoroughly waterproof, tough and dur-



able and to last a lifetime, if taken care of. It is 11 inches high and 9 inches diam. at bottom.

It appears valuable for covering transplanted plants, such as tomatoes, cabbages, &c., allowing them to be transplanted much earlier than in the ordinary way. Corn, beans, melons, cucumbers, &c., can be planted much earlier by having these protectors from frost.

They are also useful for covering



transplanted flower plants.

The price is \$10 per 100, E. O. Sawyer, P. Q., and we should like our friends to give them a full trial at once.

#### Leguminous Cropping

We are destined to hear a great deal upon this subject. It is true that the *leguminosa* possess the power of appropriating nitrogen from the air, and of adding to the stock of organic nitrogen in the land. This is the great discovery of the period in agricultural chemistry, and it will no doubt be used as a means of improving land. Leguminous crops will be more largely grown in preparation for corn, and rotations may easily be framed with this end in view. Clover may even be sown among beans instead of among barley, with good results. Peas, vetches, and lupins will also be more largely cultivated. Such a rotation as the following is a type upon which courses of cropping may in the future be modelled.—

- 1st year, mang.-l. cabbage, or swedes.
- 2nd " beans (leguminous crop).
- 3rd " clover (leguminous crop)
- 4th " wheat.
- 5th " vetches (leguminous crop).
- 6th " wheat.

or the rotation might be modified into—First year, beans and clover cut green for silage; second year, wheat; third year, vetches; fourth, wheat, fifth year, barley or oats; sixth year, potatoes, well dunged and manured.

There are certain considerations with reference to these modern suggestions which should not be lost sight of. First, the fact of the discoveries of Hellriegel and Wilforth only reveal a fact which has always been in operation. The excellent effect of clover as a preparation for wheat was fully appreciated long before it was understood. Rape is also a capital preparation for wheat, although it is not known to absorb nitrogen from the air. Vetches are an excellent crop, but have the disadvantage of being too late to be used very successfully as a catch crop. The ordinary turnip crop is as good a preparation for barley as clover is for wheat, and a good crop of early turnips fed off with sheep is probably as good a preparation for wheat as clover itself. Rotations should always be as varied in their constituent parts as possible, and it would not serve our purpose to limit them by leaving out the *crucifera*. At present, rotations are almost always composed of these three natural orders—*graminea*, *leguminosa*, and *crucifera*, and it would not answer to exclude

(1) In many soils vetches make the land too "shaltory" for wheat unless a sheep-fed crop of roots or rape intervene between the vetches and the wheat. Ed.

(2) I.e., grain and grass, pot-bearers, and the turnip family. Ed.

any one of them from a full share in cropping.

It may also be fairly asked why *leguminosa* have not already absorbed more attention on the part of good farmers. They are appreciated very highly, but as practice has usually led theory, we believe that the cultivation of these crops would have been still

further extended through the dictates of experience without scientific enlightenment. That they have been admitted to a great extent into all courses of cropping is evident, and it is possible that they may be still more widely grown. There are, however, many and varied considerations, which will probably end in holding an even balance between them and other crops. What could be a better example of a leguminous rotation than that known as wheat, beans, wheat, beans, &c.? Here we have the full effect exhibited of leguminous preparation for wheat. The system is an old one, and is still followed. (1) It, however, has not extended, but is restricted to certain soils, and does not intrude upon those on which a greater variety of crops can be employed.

We doubt, for the reasons given, that this new "gospel" will, after all, produce a radical change in our established systems of cropping. (2)

JOHN WRIGHTSON.

#### The Flock.

**Early lambs**—On the 27th. of February, we saw two very fine fat lambs hanging up in the shop of the Messrs. Brown, Ste. Catherine Street, Montreal. Both were jet-black, and we have often remarked that most of the early lambs that come to Montreal are of that colour: why this should be so is not clear. At all events, as black sheep are rarely to be found among the flocks of English-speaking farmers in this province, we must conclude that the earliest lambs are sent to market by the French-Canadians, and they deserve very great credit for their enterprise. The lambs in question were ripe-fat, the kidneys well covered, and the briskets full of meat: but they handled soft, and a few pints of pease would have made the flesh firmer: a fortnight more ago would have improved them vastly, as a quarter would have been but a small dish.

#### Sheep Worrying.

A man has a right to shoot a dog which is actually attacking his sheep, but he has no right to shoot it because it has attacked them, or because he thinks it likely that it may do so. The test is, that if the shooting of the dog will save the sheep from actual harm, then he is entitled to destroy the dog when it is actually attacking the sheep; but, if it has attacked them and is running away, the shooting of the dog would be illegal, for he would

(1) Particularly in the heavy lands of Essex, Eng., where the land is ploughed into foot ridges. Ed.

(2) The Itanes are ours. Ed.

not then be protecting them from it. Of course, in any case, he would be entitled to sue the owner of the dog for damages, and a special Act of Parliament says that it is not necessary, as in other cases, that he should prove the dog to be vicious or dangerous to the knowledge of the owner.—FARM AND HOME.

In the Cholderton flock, near Grateley, the property of Mr. H. C. Stephens, M. P., the lambing season commenced on January 7th. and up to January 23rd the fall of lambs had been seventy-four, strong and healthy, from fifty-one *Hampshurs*-down ewes which had come in. Mr. Ernest D. Briant, steward to the estate, informs us that up to the date given there had been only one ewe lost, and that two ewes had dead lambs before the time was up for lambing. His system of feeding is as follows:—Before lambing the ewes have swedes and sainfoin hay; afterwards they have a mixture of one part hay to six parts wheat straw chaffed, with 1 bushel of pulped roots to 16 bushels of the chaff; to this is added  $\frac{1}{2}$  lb. of malt combs and  $\frac{1}{2}$  lb. of pea-meal to each ewe, and the whole thoroughly mixed and allowed to ferment for thirty-six hours. This makes a very appetising food, and is a great saving of hay, which is now very scarce. Ewes with twin lambs have 1 lb. of decorticated cake in addition to the ordinary mixture. The *Southdown* flock at Cholderton has gone on well up to date, and will commence to lamb down January 30th.

**Dorset horned sheep**—The following is a description of the points of a good Dorset:

General appearance, head well up, eyes bright and alert, and standing square on legs, 20; broad, full chest, brisket well forward, 10, broad, straight back, with well sprung ribs, 15; heavy square quarters, set on short, straight legs, well apart, 10; legs white, with small light-colored hoof, 5; head small, face white, nostrils, well expanded, nose and lips pink in color, 5; neck short and round, set well on shoulders, 5; horn, neat, curving forward and light in colour, 10, good foretop and well covered on belly and legs, 10, wool of medium quality and good weight, presenting an even, smooth, white surface, 10.

**The Bordeaux mixture.**—Caution in the use of this mixture for curing the potato disease is recommended by more than one extensive grower in England. It has been found to renew the vigour of the plant so much that the tubers, instead of dying off at the proper season, keep on growing, and the tubers, instead of remaining white, turn yellow, lose their mealiness, and become waxy and soap-like. This is worth looking into, as, except on certain soils, our potatoes are not even now too fine a quality.

#### Feeding Lambs for Market.

**EDS. COUNTRY GENTLEMAN.**—I have tried raising early lambs for market for a few years and have no trouble in getting them to weigh from 50 lb. to 60 lb. when from 8 to 10 weeks old, but the butchers complain of their not being fat enough to dress well—there is too much shrinkage—and I should like a good ration for both sheep and lambs. The sheep are grade Shropshires and Southdowns, have used an imported Shropshire ram. This year expect lambs about the 1st of February.

I have fine upland hay cut in June and rowen; stone, or rutabaga turnips, and mangolds, for roots; Chicago coarse

linseed meal, old-process linseed meal, cottonseed meal, Chicago gluten (three grades), corn meal and coarse wheat bran. If there is something else that would help the ration, please add it as I should like to make a success of it if possible.

In past years I have fed to 50 sheep 3 or 4 bush. stone turnips as morning ration and wheat bran middlings and corn meal, equal parts, about 1/2 lb. for each sheep. Perhaps I have fed too many turnips and not enough grain food. I have fed about same kind of ration to lambs all they would eat, as it was kept where they could have access to it at all times.

Thomaston, Conn. G. B. J.

G. B. J. has probably fed too great a proportion of turnips and mangolds to his ewes, and as he had read carefully the advice given in this paper during the last three or four months he would have seen the proportions advised. He should turn to page 812, Oct. 27 last, and in the advice to "Old Subscriber" he will see the ration advised for the ewes before dropping their lambs and after dropping their lambs, also what is best to feed lambs separate from the ewes.

We think it advisable to feed the lambs separate from the ewes but very little, if any turnips, especially where, as in this case it is desirable to have the flesh of the lamb as well matured as possible and with as little sap as may be, so as to reduce shrinkage.

We should advise that he feed his ewes after lambing, 1 lb. to 1 1/2 turnips or beets, morning and evening, and from 1 lb. to 1 1/2 lb. of the grain food both morning and evening. But we should advise the grain mixture for the ewes in the proportion of 10 lb. corn meal, 10 lb. wheat bran, 3 lb. linseed oil meal; and as a mixture for the lambs separately, we should advise the proportion of 1 lb. corn meal, 2 lb. ground oats, 2 lb. wheat bran, 1/2 lb. oil meal. Let this be thoroughly mixed together and placed in a trough for the lambs to get at separately. The oil meal will prevent constipation, and the flesh of these lambs will shrink very little. It would not be objectionable to give the lambs a few slices of turnips or beets.

E. W. S. (1)

Farmers' Institute at Geneseo.

SHEEP-RAISING IN WESTERN NEW-YORK.

Mr. F. D. Ward of South Byron read a paper on the breeding and rearing of coarse wool sheep. He recommended the rearing of mutton-1 mbs for Western New-York, and said they should be dropped in October, so as to be ready for market Jan. 1. Such lambs are now worth 26 cents per pound in our city markets. They should make one pound of growth per day for three months. He has raised them that made a gain of one pound a day for four months. The breeding and rearing of such lambs will be found very profitable. He also urged the necessity of using only thoroughbred males, and said that the old adage, "blood will tell", is nowhere more applicable than in sheep-breeding. Gold is not found in lead mines, and profit will not come from raising \$2.50 sheep. Always breed from thoroughbred males coupled with the best ewes you can rear or purchase; thus the flock will be constantly improving. He also dwelt largely upon the necessity of proper care and food, and said that the warmest and best of winter quarters should be provided.

(1) If G. B. J. would give his lambs a few slices, daily, he would find they would shrink less. Ed.

—MR. EDWARD VAN ALSTYNE spoke on the "Value and Importance of the Sheep Industry." He urged a more scientific, systematic method in breeding, and the abandoning of the every day haphazard way of doing it, as now practised by the average farmer. Have a purpose, and be governed accordingly. Whoever contemplates going into sheep-breeding should do it intelligently, and not follow in the same lines where the masses travel.

We are eating more fresh meat than ever before, particularly mutton, and we who can should turn our attention to the breeding and rearing of mutton lambs. Make wool a secondary object, at the same time striving to put as many pounds of it on the sheep's back as can be made to grow there, remembering that the same food that makes the best mutton also makes the most and best wool and the best manure. The Michigan Merino crossed with the South Down, Hampshire or Shropshire, will bring good results. Would not cross it with the Cotswold. He favored the raising of lambs for the June or July markets, and they should then be four months old, and will sell for \$4 to \$5 each. During the time the ewe is suckling the lamb she should be given a liberal ration of nitrogenous food. (1) Oats, wheat bran, linseed and other like foods are best. Beans are also a good food, but care should be taken in feeding them, as, if too many are fed, they will produce "scours" and deranged kidneys. Mix linseed with the beans; keep the ewe improving from the time the lamb is dropped, and shear the sheep in June, as at that time the loss from shrinkage in weight of wool is less than at any other season. If the ewe is allowed to "run down" as soon as the lamb is dropped, a loss in the quality as well as in the yield of wool will surely follow. Brewers' grains, bought in the fall and carefully covered (2) in a pit, will be found an excellent food. They cost at his station, on the Hudson River Railroad, direct from the brewery, \$2.60 per ton, or kiln-dried, \$18 per ton. With him it is cheaper to buy them undried.

THE QUESTION BOX.

Is there danger of the mutton industry being overdone, and the bottom falling out?

Dr. Smead—I do not think so. Until we come nearer furnishing the supply now in demand, there will be no danger of the bottom of the mutton interest dropping out.

Is it advisable to feed as much as a pint of beans to a breeding ewe?

Mr. Van Alstyne—I stated that they should be mixed with a ration of linseed meal. If so mixed they will not be found injurious.

Dr. Smead—Beans, as well as linseed, are nitrogenous; therefore, I should say there would be too much of that element in such a mixture. I would not feed more than a third of it, as I believe it would leave a rheumatic tendency in the limbs of the animals.

Mr. Van Alstyne—I have always fed ensilage or turnips in connection with the foods I have recommended; both are laxative. Mixed or meadow hay is also fed.

Other gentlemen gave their opinions, one recommending wheat straw for ewes that are to be wintered. (3)

What is the best way to save the liquid portion of barn manure?

A Farmer—I use straw as an absorbent, and draw out the manure

- (1) And so they should while pregnant. Ed.
- (2) After thorough tramping. Ed.
- (3) Clover-hay is better, and so is pease-straw. Ed.

every day. The gutters in the stable are not water-tight; I wish they were. Other farmers gave their methods: some of them mixed the horse manure with the cows' voidings; others used sawdust.

Mr. Eastman—It is very important to have these gutters water-tight, as six-tenths of the value of manure is found in the urine; hence the importance of saving all the liquids. He recommended the use of gypsum, or what is commonly known as lund plaster, as an absorbent, as it takes up and holds all the liquids, at the same time locking up and holding the nitrogen, thus preventing a loss of it in the form of ammonia, by evaporation.

Opinions, as to the advisability of drawing manure to the field every day, differed, being nearly evenly divided pro and con., the difference, if any, being pro.

What shall we do to prevent clover from dying out?

John Gould—Cut the first crop early, to give the second one a good chance, which cut and leave off the land as a mulch. (1)

Mr. Eastman—Topdress the meadow with manure in the fall, then roll the land.

Dr. Smead—Underdrain the land.

A Farmer—Plow the land and reseed. You will find it a safer and surer remedy. (2)

Is it advisable to roll wheat land in the fall the same as for a spring crop?

A number of voices—Always follow the drill with the roller.

John Gould—Did you ever follow the roller with the drill? That is the best way. (3)

Mr. Bullony—I always roll in the spring, not in the fall.

A Farmer—I follow the roller with the drill always.

Opinions on this question differed. (Cultivator.)

Who Knows What Ails the Lambs?

R. F. L., Greenville, Va.—I have a lot of ewes that are now dropping their lambs. Some are doing badly; they seem to have plenty of milk, but it does not agree with the lambs. I have lost seven out of twelve. I am feeding corn and cob crushed (fine) half a bushel, a quarter of a bushel of whole oats, and one bushel of wheat bran, hay and fodder. I am feeding 1 1/2 bushel of this mixture to 74 ewes which are in fine condition.

Ans.—Not knowing the circumstance in this case and how these lambs were affected, it is impossible to give any opinion that would be helpful. But it may suggest a reason for the trouble, to say that corn cobs are not proper food for sheep on account of the sharp flakes of the cobs producing inflammation of the stomach (4). Sheep should have the grain food only coarsely crushed, and it should be fed in shallow feed troughs so that the greedy animals will not swallow it too fast. This of course leads to indigestion. The allowance of grain food is not too large. It is not desirable to have a breeding flock of ewes in too good condition as fat ewes generally have weak lambs. A fairly good condition (5) is all that is required. Sheep's milk is naturally

- (1) Oh! we afford to lose our best-winter sheep food? Ed.
- (2) Sow it less frequently. Ed.
- (3) Mr. Gould is quite right. All fall wheat should left with a rough surface. Think how pasty a rolled surface would be in a spring, and how heavy land would bake afterward. Ed.
- (4) Just as ground, unsifted oats serve calves. Ed.
- (5) With plenty of nitrogen in the food. Ed.

much richer than cow's milk, without increasing this richness by too good feeding. It is very difficult to rear lambs as well as they should be, without some laxative food, as roots of some kind, for the ewes. (1) If a few cut potatoes, half a pint per ewe, could be given it might be found useful. A few sliced turnips or mangolds or cabbages would be better still.

R. N. YORKER.

SHEEP RACKS

The combined hay- and grain-rack for sheep shown in fig. 1 is recommended in the Farm Journal by Mr. HENRY WILLARD of Ripon, Wis. The grain-rack in front is pivoted by bolts passing through the extended end of the rack into the two upright scantlings. When the grain-ration is eaten, the rack can be raised and fastened up out of the way, as shown by the dotted lines. This being done, the sheep have free access to the hay-rack. The front edge of the hay-rack floor is 2 feet from the ground, and the front pickets 2 feet long, 2 inches wide and 3 inches apart. At the top of these front pickets is a shelf or screen, shown in cut, fastened to the scantling, and to which

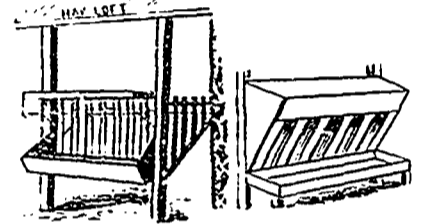


Fig. 1.

Fig. 2.

the pickets are secured. The front edges of the pickets are rounded off smooth. The advantages claimed for this rack are: 1. Economy of floor-space; 2. Economy of food—no waste; 3. Protects wool from dust; 4. Does not wear off wool; 5. Safe for the animals; 6. Cleanliness of grain trough.

The rack illustrated by fig. 2 is a simpler affair, to be constructed against the side of the sheep shed. The feed trough is 9 inches from the floor, 15 inches wide and 6 inches deep. The pickets of the rack are 2 feet 9 inches long and 3 1/2 inches apart. A foot-wide board is nailed along the top of rack. (Cultivator.)

ADVICE.

It is by no means easy to give practicable advice. What, indeed, can be done with a lot of hungry lambs in a season when we have little hay and only rotten turnips? The turnip, it is true, is a watery esculent at best. Twelve tons of these roots contain 10.8 tons of pure water, and only 1.2 tons of dry matter. We thoroughly appreciate the value of sound turnips. They are a natural, succulent food, which not only are nourishing, but wholesome for sheep. We have, however, to face a practical difficulty, and it is well to remember that only one-tenth part of turnips and swedes is of absolute feeding value. If we can supply this one-tenth part by corn and cake, we must rely on water to do the rest. We are not prepared to say how much cake will be required to supply the same amount of nourishment as an acre of average turnips or swedes. The question cannot be solved by analysis. Mr. Warrington very properly observes that "the same weight of dry matter in crude foods of this class (roots) has a decidedly less nourishing value than in foods consisting entirely of matured

(1) Too many roots are likely to cause ewes to produce dead lambs. Ed.

grain." The "fat" with which turnips are credited in analysis is to some degree waxy matter of inferior value to the fat in oilcakes, and neither the proportions of albuminoids nor of carbohydrates in turnips can be considered as of equal value with the same percentages in cake or corn."

#### ADVANTAGE OF MIXING FOODS.

We certainly recommend a mixture of concentrated foods. Linseed cake alone is too heating, and if the sheep are to be kept in health it ought to be mixed with a proportion of foods poorer in albuminoids. If this precaution is neglected we shall run a chance of sore teats and sore mouths. In the above remarks we were chiefly aiming at arriving at the limits of cost. We now suggest that a mixture should be made on the most economical and scientific grounds possible. The mixture should be readily constructed, and be free from complication. It should be composed of farinaceous and albuminoid constituents in fair proportions. We suggest the following:—

First mixture for ewes or dogs	1)
1 bushel of linseed cake	} 1 to 1 1/2 lb per head.
1 " cotton cake	
2 " maize crushed	
Second mixture for ewes	
1 bushel of bran	} 1 to 1 1/2 lb per head.
1 " linseed cake	
1 " barley	
1 " maize	
Third mixture for lambs	
1 bushel of white peas (2)	} Quantity per head to vary with size.
1 " linseed cake	
1 " malt culms	
1 " crushed barley	
Fourth mixture for dry sheep	
1 bushel of wheat	} 1 to 1 1/2 lb per head.
1 " barley	
1 " oats	
1 " linseed cake	

JOHN WRIGHTSON.

## Poultry.

### A Poultry house for the Farmers, and what should be in it

A farmer need not go to any great expense in preparing an habitation for his fowls during the winter season. A comfortable house can quickly and cheaply be made in the corner of a barn, shed, or outbuilding. It may be in the shape of the unpretentious lean-to or the more imposing compartment house. Much of course depends upon the resources and ingenuity of the builder. The writer, some twelve years ago, made his own poultry houses, and although five winters, of more than ordinary severity, followed their construction, yet water did not freeze in them, and no artificial heat of any kind was needed. An old cow stable and carpenter's shop combined and forming a building about 16 x 10, was utilised. The inside was torn out, but the outside boards (doubled) were allowed to remain on the cedar posts which formed the frame of the building. In the inside of these outer boards was placed tarred felt paper kept securely in place by nailed laths. The space was tightly packed, up to the rafters, with dry white pine saw-dust. In order to facilitate the packing process, only two inside boards were nailed on at a time. A ceiling, seven feet from the floor, was made so that it could be removed in the warm summer months and afford greater ventilation. In the fall, the space between the ceiling and the pitch of the roof was filled with hay, straw or dry leaves which were let down as

(1) A lamb when weaned, becomes a *lamb*, and retains the name until it is a *Hog an hogget* mean the same thing as *veg*.  
(2) Observe this! No English farmer would mix peas in a ration for lambs.

occasion required during the winter for the fowls to scratch in. The total cost of the saw dust, lumber, tarred felt paper, nails, etc., was \$ This house was divided into two rooms, one being slightly larger than the other, the partition going up to the ceiling. This description is not given as a model, but it may be useful as showing what can be done with a building that would otherwise have been useless.

Where it is difficult, or impossible, to procure saw-dust, an air space, with one or more layers of paper may answer the purpose, but the experience of the writer and one or two of his friends proves the air space a failure as compared with a saw-dust lined house. As has been said, there is no cast iron rule to follow in building a house, as so much depends upon circumstances, but the aim should be to have it so that the temperature will be over the freezing point, rather than under it. The reasons why this is desirable have been given in the article preceding this one.

The house should face the south, so as to receive as much sunlight as the short days of winter will permit. But while plenty of light is absolutely necessary for egg production, the window or window should not be too large, for they are as likely to admit the cold of night. Where double windows are not used, a shutter will answer the purpose, but it must be opened so as to admit early daylight.

#### THE BEST KIND OF FLOOR.

By all means let the floor of the house be of wood, for it will be found to keep dry better than any other kind and has the advantage that you can put earth, straw, chaff or kindred substances on it and they will keep dry. Earth floors tightly packed, or even those of concrete or tile are likely to be cold, and the tightly packed earth floors have certainly been found to get damp, and damp means disease and death to poultry. A good plan, where it is possible, is to have half of the floor of wood and the other half dry sand and fine gravel to which coal ashes and particles of broken mortar or crockery may be added. The fowls will scratch and roll in the mixture and pick up the lime, grit or gravel as they require, either substance. It will, in fact, answer the double purpose of dustbath and scratching ground. It will also prevent egg eating, feather pulling and the laying of eggs with soft shells. It should be raked over and renewed occasionally to ensure cleanliness and sweetness. More will be said on this subject when the proper winter treatment of laying stock is reached.

#### WHAT SHOULD BE IN THE HOUSE.

A good roost is made of a 2 x 1 scantling, with the edges very slightly rounded off. A narrow, or a small round roost should not be used, for either will make "crooked breasts" in the young stock and spoil them for market purposes. The roost should be 12 or 18 inches over a platform, the latter about 24 inches wide to catch the droppings and not more than 18 inches from the ground. The heavy breeds, such as Brahmas, Langshans and Cochins, should never be allowed to jump from a greater height than 18 inches, otherwise they are apt from coming heavily on the floor to get a very hard corn on the sole of the foot, very painful and very difficult, if at all possible to cure. This ailment is known as "humble foot." With the lighter breeds, the height of roosting place is not of so much moment, but in the opinion of the writer no laying hen should be allowed to jump from any height.

#### NESTS.

The nests should be so dark that the hen after laying the egg will have no desire to loiter in it. It is well that she should not see the egg after it is laid, for absence of light is a preventative of egg eating, a practice which once acquired is voraciously prosecuted. Prevention is infinitely easier than cure. The patterns of nests are many. Those in use in the Experimental Farm poultry-houses are fastened to the wall, about 18 or 24 inches from the floor, and are entered by a covered passage way from the front turning sharply into the nest to the left. They have not been long enough in use to permit of a decided opinion being formed of their value. Other nests are made on the floor so that the layers will have to creep into and out of them. Again others are placed high up on the wall, so that the fowls will have to fly up to them, but they are objectionable on account of the impossibility of the heavy breeds reaching them without risk of injury, and the inducement offered to the lighter breeds to roost on them. Patent nests so arranged that the eggs disappear as soon as laid, are sometimes used, but the fowls in many cases prefer to lay on the floor. A nail keg partly filled with straw has been found to make a good nest, for the light breeds.

#### THE DUST-BATH.

Another important article of furniture is the dust-bath which can be made by dividing off a space 3 x 1, with sides 8 or 10 inches high, in a corner house, where the sun can strike, or by constructing a box of the dimensions named. The dust bath is the means by which the hen keeps herself clear of vermin. In it should be placed road dust, dry sand or earth, coal ashes, &c., &c. A small quantity of sulphur added occasionally will greatly assist in ridding the fowl of any vermin. Of course the dry earth, road dust or sand must be laid in before the fall rains set in. It is imperative that the dust bath should be composed of dry material, or its value will be lost. Where space will permit, the dust bath may be made as large as desired. The foregoing applies to houses where only a board floor is used.

#### OTHER LITTLE NECESSARIES.

Other small but necessary articles are a narrow trough about 1 1/2 inch wide and about 6 or 8 feet long, to hold the soft morning feed. This should be screwed on, or hung by hooks on to the side of the house. The narrowness of the trough will prevent the fowls from jumping into the feed and dirtying or turning it over, as they will do in the case of a broad shallow dish, placed on the ground. A small tin or wooden pail, or better still, a fountain to hold the drink water is also required. Sometimes a small box is necessary to hold broken mortar, broken oyster shells, grit in the shape of sharp gravel, &c., but where the narrow feeding trough just described is used these essentials can be placed in it. It is a good plan to have a quantity of gritty substances on the floor of the house all the time so that the fowls can pick them up while scratching among the chaff or straw. The inside walls of the house should be whitewashed once or twice a year and the straw litter on the floor occasionally removed and replaced so as to have a sweet and clean. None of the substances or articles named are beyond the reach of the poorest farmer.

#### THE NEXT SUBJECT.

We have given some consideration to the kind of house to have and what

should be in it. In our next chapter we will treat of the proper fowls to put into the house and their treatment, so as to have eggs in paying quantities in winter, a season when they are at the highest price.

#### The Montreal Poultry-show.

A very successful exhibition indeed. The whole really included hardly any inferior specimens. Mr. Baker of Côte St. Antoine had several excellent pens of "Silver-laced" *Wyandottes*. The two pens of *Dorkings*, exhibited by Mr. Campbell, refreshed our eyes, for they were absent last year from the show. The hen, however, was but a moderate specimen and the great size of the cock made her look meaner than she really would have appeared if shown in a separate pen. The *Emden* and *Toulouse* geese were very heavy birds. The *build* of the *Aylesbury* ducks, as well as the colour of their bills, distinguished them from their next door neighbours—the *Pekins*, though some people rashly assumed that they were of the same origin. Showy ducks, the latter, but more feather than flesh.

The *turkeys* were not as good as we have seen them, and they look cramped for room, especially the cocks.

The show of pigeons was excellent; the *fantails* were superb. A pullet was labelled, "What is it?" Well, it looked to us like a white hen drawn down a chimney. Such a fowl is bred in Glamorganshire and called a "Sootie". The Welsh trout-fishers give as much for a specimen as 10 s.; the feathers make a queer coloured artificial fly, which, with the "cock about dhu", meaning red above black, are the only two a true Glamorgan man condescends to use, as he would scorn the modern innovation of the "coachman", the "March brown" or "Holland's Fancy" though the trout of the Ely, the Gweny, and the Ogmoro are not above being *deluded* by them.

#### A Scarcity of Eggs.

The experience of the present winter convinces me more fully than ever that it is folly to expect eggs in very cold weather if hens have their liberty. No matter how comfortable they may be at night, or what cosy nests we prepare for them, few eggs can they produce if they run out all day on the frozen ground. Their vitality is simply insufficient to supply heat for their bodies and for egg production too. You can keep them healthy, active and in good condition, but you can't prevent upon them to lay eggs.

To make poultry keeping in winter really profitable we must do more than this, we must provide some means of heating their houses artificially in very severe weather. The average farmer, however, would rather forego eggs altogether than go to this trouble—and expense, I was about to add, but the expense I believe would be fully justified by the increased number of eggs. Still, as it would take a person of far greater persuasive powers than I possess to convince them of this, I shall simply suggest to them the next best thing—to make the hen house fairly comfortable and to put in a few glass windows; then, after covering the floor with cut straw or something of that sort, to keep up the hens on bitter cold days. Of course the flock would be rather restive at first, for fowls dearly love their liberty, but if their natural wants were supplied, a dust bath and box of gravel provided, and dry grain scattered in the straw to keep them scratching, they would soon become reconciled and be much more comfortable,

and, of course, happier, than when out on the frozen ground, holding up first one foot and then the other to keep them from freezing, and with frosted combs dripping with blood.

On warm, sunny days, when the ground is not frozen, let them out by all means; they will pick around and get things to eat that we should never think of giving them, and often in the afternoon when, after an inclement morning, the sun comes out warm and bright, they would enjoy immensely a run of an hour or two before roosting time. Hens do need exercise, but if you watch them out of doors you will see that they are still a great part of the time, and they had much better be spending that time in a house sheltered from the chill wintry wind, where instead of standing upon the hard frozen ground their feet will sink deep into soft warm straw. But some light they must have in their house, else many will remain upon their perches and mope all day without even coming down to eat. So put in a few glass windows by all means. They are not expensive and if arranged to slide back against the wall instead of opening, there is small danger of breaking them. Windows are to be preferred with a southeastern or southwestern exposure—better one of each, so as to admit the greatest amount of sunshine.

I used to think that getting eggs in winter depended upon the breed, and I am still of opinion that it does to some extent, but I believe now that most of the improved breeds will lay fairly well if we provide for them comfortable quarters as well as suitable foods. Of course such a fowl as the Black Langshan, possessed of plumage of extra softness and thickness, will be more easily kept warm than the more thinly clad Leghorn. Still, in warm winters, we get nearly as many eggs from one as the other. I have both, and with the thermometer ranging from a little above to several degrees below zero, I get some Leghorn eggs every day. The trouble is that neither kind lay well, although both get a variety of suitable food. At night, their supper consists mostly of sound wheat boiled to bursting, with some whole corn, not much; their breakfast of cooked cracked corn mixed with an equal quantity of wheat bran, seasoned with salt and chopped meat, cracklings, or something of that sort if I can get it; at noon they have sorghum seed, which keeps them busy for hours getting out the small kernels, and whatever green food I can provide for them. Some days, they have potatoes or other vegetables, and I have just got in some finely chopped hay which will be steamed and sprinkled over with wheat bran. They need more meat, ground bone, and oyster shells, perhaps; still, in warm winters they lay well on the above regimen. For drink, they have warm milk three times a day, which in cold weather is slightly thickened with corn meal gruel. All soft food is fed warm, as a big wood fire burns continually in the capacious fireplace of the back kitchen and affords ample opportunity for warming and cooking things.

I thought perhaps the hens were too fat, and caught a lot to dress for market, but nearly all were so light I had to let them go. The trouble is all owing to their running out this dreadful cold weather. Next winter I shall provide them the right sort of a house, and shall not try to winter more than can be accommodated indoors during all the bad weather.

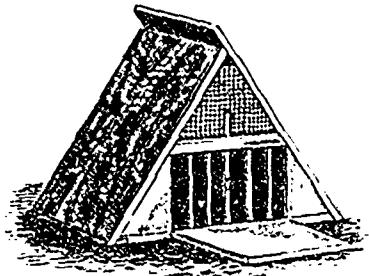
Logan County, Ky.

A FARMER'S DAUGHTER.

Cultivator.

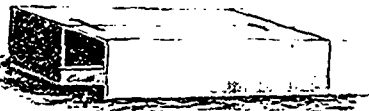
Handy Coop and Laying Boxes.

EDS. COUNTRY GENTLEMAN—The readers of your paper generally have the best of everything placed before them, and, as it is largely the contributions of practical men and women, these designs for laying boxes and coop for hens and chickens seem appropriate to be submitted for criticism and instruction. Both have been in use in our yards for twelve years past,



and have proved satisfactory beyond any others that have meantime come under our notice. If neatly and well made, occasionally painted and properly cared for, they will last many years; some of ours have been in constant use for fifteen or more seasons, and the first cost need not be great.

An empty shoe-box or similar packing-case will furnish most of the lumber. The material for the coop should be 1/2-inch, dressed on one side. The



bottom frame 1 by 2 inches, halved together at corners; ridge-piece 1 1/4 inches; wire cloth in upper front 3/4 or 1-inch mesh. The slats for front, of hard, strong wood, 1/2 by 3/4-inch, the centre one movable, and all let into mortices, top and bottom. There is a movable bottom board, 19 by 29, of 1/2-inch stuff. The front board of coop can be best secured with wooden buttons. We have abandoned hinges as they rust fast. This board, when down, can be used to place feed on. The bottom-boards will save many a



brood from marauding skunks and rats.

The laying boxes have the merit of seclusion, which will please biddy and prevent excuse for a stolen nest. One end can be placed against the building, and the interior will be made quite dark and perhaps stop egg-eating. No bottom or back should be used, so they may be easily whitewashed and kept clean. The front, when raised, can be rested back on the top while gathering eggs.—Cultivator. J. W. M.

Apiculture.

THE PROFITS DERIVED FROM AN APIARY.

We translate the following article from one that appeared in the January number of the *Journal d'Agriculture*.

I have great pleasure in acceding to your request that, for the benefit of the readers of the *Journal d'Agriculture*, I would give you some information on the prospects of apiculture in this province. I will state, in as few words as possible, what are the principles of the improved method of bee keeping as regards the hives with movable frames, and the different modes of managing them.

I am so thoroughly convinced of the

superiority of this system, over the old plans, that I feel sure that if they were better known by those that possess a few hives of bees, the fixed-comb hives would be no longer used anywhere. For, with the movable frames, the harvest is no longer a matter of chance; the bee keeper has the whole affair in his power to deal with as he likes; he can use his apiary either for the purpose of gathering the yield of honey, or for the increase of his colonies, or partly for one, partly for the other purpose.

The queens which are worn out may be replaced by younger ones; a very important point; the natural increase, swarming, may be almost entirely stopped, so that the entire offspring of a colony may be kept within the same hive, whence it comes that very rich harvests may be gathered amounting to a hundred, one hundred and fifty, and occasionally to even two hundred pounds of honey from one hive.

Such yields, doubtless, are not obtained every year and in all localities, but I know that there are some districts where even these quantities are greatly exceeded. I can fancy how some of my readers will open their eyes when they read this; but I must tell such that, if they will take the trouble to study modern methods and go to work in a good spirit, I can promise them great surprises even in places that are supposed to be unfit for honey production.

How many young people could save money by taking care of a few hives; it only demands the sacrifice of a few minutes every day. I know what I am talking about, for I began in this way myself, and I should rejoice at leading others along the same path; knowing, beforehand, that, like me, they will soon be deeply interested in the marvels displayed by the interior of a beehive and by its wonderful management, the inspection of which is so greatly aided by the movable frames.

Well, to encourage those who wish to improve themselves in this art, I must inform my readers that at the request of the patriotic Director of the *Journal*, I, with the assistance of some other experienced bee masters, intend to write a short series of articles on the proper care to be bestowed on bees at the different seasons of the year. These articles will be based on an experience of ten years of steady practice, and will have the advantage of containing the most recent information on the subject. In conclusion, I must add that there are few more profitable occupations than well managed apiculture, and that as long as my hives continue to yield 50 lbs of honey each, beyond what is required for the consumption of their inhabitants, I shall make it my chief pursuit, and increase my 150 colonies as much as circumstances will permit.

Ste Foye, 21th December, 1892.

J. H. BLAIS.

The Orchard.

Piece Root-Grafting

For a number of years certain nursery men have advocated grafting on sections of roots but with doubtful success.

Facts are clearly demonstrated to prove that whole roots are the most reliable and that they produce trees more vigorous, symmetrical, fruitful and longer lived.

The influence of the stock upon grafted trees is very remarkable and although the facts appear, it is difficult to explain why, for instance, an apple

grafted on the Paradise stock, will always remain a dwarf, but a healthy or prolific tree, while one grafted on a crab or strong growing apple stock will attain the vigor and habit of growth of its base. The same rule holds good with the pear on the Quince, or seedling pear stocks, the cherry on the Mahaleb, etc. etc. In roses, this is particularly noticeable, some of the weak, slow-growing hybrid perpetuals are but of little use on their own roots, but when budded upon the dog rose or the Manetti are robust and floriferous, as for instance, the old "Géant des batailles", while others are not improved by being worked on any other sort and seem to thrive and produce more flowers on their own roots as "General Jacqueminot", etc.

We live in an age of rapid motion and try to obtain our ends by quick processes which may not always be the most satisfactory in the long run. Section root grafting of fruit trees is one of these processes, and if a workman can make a much larger number of root grafts in a day by using pieces instead of whole roots, but numbers of them entirely fail, and none are so good as the slower method, surely the system is to be condemned as dangerous.

We will summon a few witnesses of acknowledged authority as to this practice, and see how dangerous it is for the tyro in fruit culture.

Charles Downing, in his standard work, "Fruits and fruit-trees of America", thus writes:

"The practice of piece root grafting is of very doubtful value and by prominent horticulturists considered as tending to debilitate and reduce vitality, the seat of vital life, in resting in the natural crown of the seedling, and that, once destroyed cannot be renewed. It is therefore apparent that but one healthy permanent tree can be grown from a single seedling stock."—Prof. J. L. Budd, before the session of the American Pomological Society at Washington, said:

"In sections where injury to apple trees by root killing is unknown, the budded or crown grafted trees are to be preferred. To illustrate—3000 grafts were inserted on strong seedling roots and set in trenches. By their side were set grafts (3000) on two inch sections of roots."

\*\*\* The results in nursery were very striking. The crown grafts made a uniform growth of four feet the first season, while the lower section grafts ranged from one to three feet, with many gaps where root and cion both died together, when three years old. \*\*\* not five per cent of them equalled the poorest of the crown grafts in height, stockiness or thrift.

"In the orchards, the crown grafts are yet ahead in size, conformity of growth, health and bearing.

"The most profitable is the crown graft planted down to the top bud of the cion."

The argument that these are more expensive to make should not be considered. It is true the trees stand deeper in the nursery and are harder to dig, but the increased labour is more than compensated for by the stronger and better distributed root system.

Berekmans, an horticulturist of 50 years experience in Belgium and Georgia, U. S. A., says, emphatically, that the most desirable method is to use a whole seedling as a basis for a tree if a standard is expected.

"The history of all piece root worked trees planted in orchard since 1860 has been the same, eight or ten years of life, a few small crops of fruit, and then, DEATH.

"The old honest method of using the whole healthy seedling as a stock, alone should be practised. The object to obtain longevity and fruitfulness can only be obtained by giving a tree, for its basis a healthy stock capable of penetrating the soil with strong roots, and an abundance of lateral roots to draw its nutrition."

First Vice President *T. T. Lyon*, "Am. Pom. Soc." says: "It is plainly against nature to take a cion which has grown up in the air and sunshine, place it under ground, and expect it to change its nature so as to make a perfect root system as if it were a seedling."

*Benjamin G. Smith*, Pres. Mass. Agricultural Society says: "I thoroughly believe in whole stocks for grafting."

*Franklin Davis*, 1st Vice-President American Pomological Society: "We must plant the whole stock leaving the crown as nature formed it. We know that such trees are the best, and in making an improvement so important as an Orchard, there is no economy in using the inferior article."

*Judge S. Miller*: "The whole root is

plant piece root trees. No doubt a host of further evidence might be adduced to establish the theory and exemplify the practice of whole root grafting, but the following wood cuts, taken from photographs, should be enough to convince the advocates of sectional root grafting that their plan is unnatural, unprofitable, except to the nurserymen who make them, like the pedlar's razors, for sale, not for use.

The two following copies of photographs are taken from trees grown in the nurseries of Messrs Stark Bros. Louisiana, and No. 3 from a photo used by Mr. Prof. L. H. Bailey of Cornell University in illustrating an address on root grafting and budding before the American Nurserymen's Association.

From what has been adduced, it would appear that the uninitiated should be cautioned against the danger of being supplied with trees which are not properly grown so as to make healthy and successful growth in their hands. Perhaps the advocates of piece root grafts may be able to see a way by which they can overcome the diffi-

almost indispensable purpose, where extreme hardiness is desired; and when a variety of known hardiness is used—placed upon the piece-root, which acts as a temporary support till roots of its own are developed. We thus obtain a tree upon its own roots, the most desirable of all kinds, and without doubt the one that will best withstand the vicissitudes of our climate. It has been my experience that good apple trees, for all situations, can be grown by using only the first and second sections of root, which should not be less than 3½ inches in length and the scion between 5 and 6 inches. These when properly joined together will, under ordinary conditions, make a growth which, if not equal to a budded tree the first year, will generally be quite satisfactory.

The pear is almost entirely propagated by budding. There are a few nursery firms in the Eastern States which, to demonstrate conclusively, if possible, which is the best method of propagating the apple for northern sections, began last year a series of experiments in root-grafting. In this experiment, whole roots and sections o-

It is gratifying to note by the above that experiments are being made to test the question of grafting on root-pieces as the efficacy of the practice is doubtful in some cases.

The piece-root may be good to act as a temporary support to the tree until it makes roots of its own, but the question is; is a tree on its own roots always the most desirable?

In cases of weak growing sorts, at least, the proposition is open to discussion. We know that the natural vigor of a tree is reduced by grafting on a dwarf growing stock, as witness the apple on the Paradise stock, the pear on the quince, &c, and many roses are increased in vigor of growth and production of flowers by being budded on the robust dog-rose.

If the stock is hardy, there seems no reason why the hardiness of the tree should be impaired by grafting.

Is it not probable that many grafted trees are not hardy because they are not hardy crab-stocks but on such as are raised from an indiscriminate mixture of apple seeds?

It is admitted that the whole root graft makes the strongest growth, cannot the tendency to sprout be overcome by removing the suckers as they appear? however, *experientia docet*.  
GEO. MOORE.

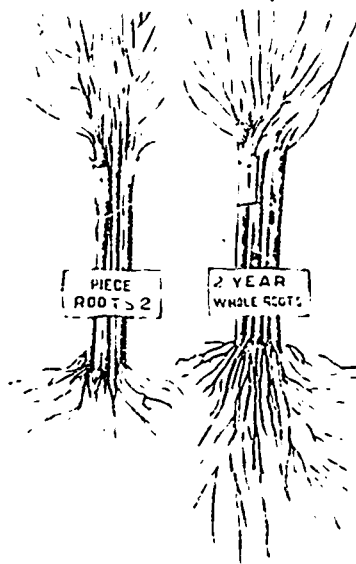
Orcharding at the North

With our constantly-increasing knowledge of fruits and fruit culture, and the growing interests of the masses, the area devoted to orcharding in this province and throughout the Dominion is continually widening, and from present indications it would seem, at first sight, but a short interval before the time was reached when the various horticultural products adapted to our soil and climatic conditions could no longer be profitably grown. On second consideration, however, it will readily be seen that as our knowledge of varieties and their capabilities becomes more exact, so will our ability to produce fruit of a higher grade of excellence be correspondingly increased, so that skill assisting well-directed effort will place on the market, at a greatly decreased expenditure, an article of superior quality, thus more than off-setting the decrease in price on account of the largely augmented total market product.

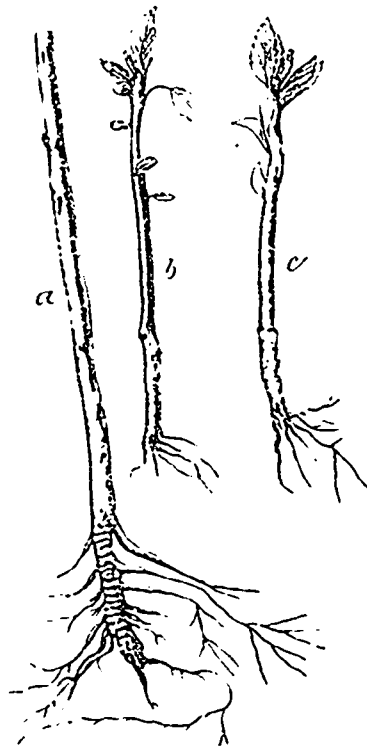
We may safely take it as an axiom in successful orcharding that the healthiest trees produce the finest fruit—fruit the best in quality, the longest keeping, and samples the handsomest in appearance. With this proposition submitted, let us consider the best means of attaining such a desirable end. Taking it for granted that we have healthy, well grown, two-or three-year old nursery trees—the former are preferable in my opinion—and desire to plant an orchard: Select well-drained, loamy soil of good depth, with a northern exposure. Any treatment previous to planting which will bring the soil into a fair state of tilth is very desirable. A root or hoed crop is particularly useful towards securing this effect. Stake out the rows thirty to forty feet apart for such large growing varieties as Golden Russet, Fameuse and St. Lawrence; for varieties which come into bearing earlier, and are shorter-lived, 18 x 24 feet will be a sufficient distance. Duchess, Yellow Transparent, and Wealthy are good examples of this class. Be generous in digging the holes, give plenty of space for the roots, in addition to a thoroughly pulverised root-bed at the bottom, made by replacing the more or less infertile subsoil with richer material from the surface. You will



Copy from photo showing (1) piece root apple tree 2 yrs. 3 to 4 feet. (2) piece root 2 yrs. 4 to 5 feet. (3) whole root grafted apple 2 years.



Ben Davis—2 years in Stark



a Piece root 3 year old. b and c show how piece root-grafts grow on one side.

the natural system and we cannot stray from this line without deterioration sooner or later.

*Prof. Mehan*, a life member of the American Pomological Society. A few weak fibrous roots are no value to a tree, we want the large roots also which are full of strength &c.

*Prof. L. H. Bailey*, Department of Agriculture, Cornell University, says: "cuttings of roots always form new roots on one side and in 9 cases out of ten these are stronger on one side than the other."

"Piece root grafted trees have not so much strength to start with, they are more straggling, are apt to tip over, and are not so long lived."

"Trees grafted on whole roots have more force; a larger engine and more power behind."

In Illinois the consensus of opinion is entirely in favour of whole roots, and the State Horticultural Society advises all to investigate before they

culties enumerated above, and as long as they are honest in their convictions and do not advocate the method for the purpose of manufacturing a cheap article irrespective of its intrinsic quality, nothing can be said, but the dangers attending it should be set before the public so as to guard them against disappointment and loss so injurious to the good cause of fruit culture.

GEORGE MOORE.

Experiments in Root Grafting  
ADVANCE COPY OF REPORT FOR 1892.

It would seem that for the milder portions of Quebec and Ontario, where root-killing is unknown, budded trees (especially as we have no reliable data bearing upon the relative length of life of budded and grafted stock) will give the most satisfactory results. But for the colder portions of our country, the piece-root would seem to serve an

purpose of comparison. I have photographs with me, illustrating the development of these grafts at the close of the first year. I will not take the time to stop and explain them, but I will place them here for your inspection. They show the process of development of these trees propagated by the different methods. This work of root examination will be continued from year to year, as was done the past autumn, when a sample tree propagated by each method was taken up and the root system carefully examined, and by the photographs you will see the changes which are already apparent—the whole root-graft making the strongest growth but showing a tendency to sprout. The first section seems very satisfactory. This work will be continued till conclusive and reliable evidence is gained upon it.

JOHN CRAIG

Horticulturist Central  
Expt Farm Ottawa.

pardon me for repeating one or two primary instructions: Pare smoothly all wounded or bruised root surfaces, cut the broken root extremities from the under side to favour the downward omission of roots. I am not in favour of severe top-pruning at the time of transplanting. If trees are dug with such care that the roots are not unnecessarily mutilated and shortened, the cutting back, so generally advocated, can in a large measure be obviated.

In replacing the soil, see that every space, no matter how small, between the roots, is well filled; and finally, see that the soil is firmly packed throughout—this is, most important, as the minute and early starting rootlets will obtain a speedy hold upon mother earth, in proportion to the closeness or proximity of the contact. It is also important that the surface of the soil about the tree should be kept in a loose and finely pulverised condition, to prevent evaporation and subsequent drying out.

From an address, by

JOHN CRAIG,

Horticulturist,  
Expl. Farms

#### Thinning fruits.—New variety of Apple.

Before proceeding to the consideration of varieties allow me to say a word upon the importance of thinning fruits in years of heavy production. As we have already seen, in discussing the development of new varieties, the perpetuation of its kind is the object in life of all plants. The production of a large number of seeds gives greater certainty to this object; but seeds, botanically the fruit, in the case of most fruits, are matured at the expense of pulp, so that he who would obtain the best results must use his judgment in regard to the amount of fruit each tree is capable of bringing to the highest state of perfection, always remembering that size and perfect development are secured in inverse ratio to the amount of fruit upon the tree.

Let me now draw your attention to some of the new varieties which seem to be of coming importance. Constantly new varieties are being brought before the attention of the public, some worthy of introduction, others entirely unreliable. Last year, one of the varieties came under my notice, which I think will prove of much value to parties, not only in northern but in southern Ontario, in fact, I would commend it for trial in all the appl. growing regions of the Dominion. The variety I refer to is one known as McMahon's White. It originated in Wisconsin some years ago. It has been planted widely and has been fruiting for some years past. I saw specimens of the fruits grown in Minnesota and Wisconsin last summer, and was very favourably impressed with its appearance and quality.

The tree is doing well in the Experimental Farm orchard. Thus far, it is one of our best and healthiest trees, and altogether I think it is a variety that has come to stay, and indications at present are that it will be a profitable variety.

The fruit is large and oblong, somewhat ribbed and attractive, a yellow ground partly covered with a red blush, and last year I am informed that it brought the highest price of any apple in the Milwaukee market, at the time of its shipment.

JOHN CRAIG,

Horticulturist,  
Expl. Farms.

## The Garden.

### A Long Succession of Stocks.

The good qualities of stocks are well known to all lovers of flowers, but in only a few cases can it be said that the fact of its being possible to have them nearly or quite all the year round has been gasped and acted upon. During mild winters I have been able to gather from strong plants in the open air repeatedly, and succeeded in doing so nearly up to January in this year. Then came the severe frost, which, when these lines were penned, was still with us, and the stocks suffered badly in common with many other things. Perfectly hardy they are not, there being, according to my experience, no exception to this rule, the Brompton as well as the East Lothian and other intermediates being completely destroyed occasionally by severe frosts. In order, therefore, to be certain of a nearly or quite constant supply, resource must be had to frame, pit, or house culture. There are several types of stocks, which comprise many excellent varieties. All things considered, the East Lothian varieties, five in number, are the most valuable of all, these being very continuous flowering, and, as before stated, fairly hardy. In the more northern counties they are far more extensively grown, and their merits better appreciated than is the case in the southern parts of our Isles, though this would not be the case if it was generally known that they do not require any very special treatment in order to have them at their best. If the seed is sown with that of other varieties late in March or early in April, the plants being duly pricked out in boxes of good soil, hardened off, and finally planted out in well prepared beds or borders not later than the first week in June, they will commence flowering late in July, and continue gay long after the more tender occupants of the borders are crippled by frost, or damaged by heavy autumnal storms. They winter best when on rather high and dry ground, slopes and such like. By sowing seed early in May, and planting a batch where they can be covered by frames, larger and better spikes will be had in the autumn and during the winter, it being also possible to safely transplant these stocks from the open borders to pits or frames, while some, if preferred, can be placed in 8 in. or slightly larger pots. The East Lothians are worth growing, even if no protection is to be afforded them.

Of the true intermediates there are now four distinct colours available—crimson, scarlet, purple, and white—and it is these that are most generally grown in pots under glass for early spring flowering. Well managed, or as sent in large numbers to Convent Garden Market, they are very effective, paying well for the trouble taken with them. In very many cases, however, they are kept in a semi-starved state in small pots for too long, the final shift being given after the mischief has been done, and poor spindly spikes of flowers are the outcome. The seed should be sown about the last week in August, a week later rather than any earlier, and not in heat. Instead of placing these seedlings singly in 3 in. pots, I prefer to place them direct in their flowering size, three in each 6 in. pot answering well. At first, they ought to be carefully watered, or the soil may be sored, and during the winter a greenhouse shelf is the best place for them. Commence feeding when the flower spikes are forming. To succeed these intermediates, there is a very charming form of ten weeks stock

available, this being distributed in this country either as the new forcing ten-week or snowflake. It is quite a gem for pot work, each plant, if well grown, producing a strong central, and sometimes side spikes, of pure white clove-scented flowers. A good percentage are double, but the singles are not to be despised, the flowers being large and quite good enough for filling vases. The first packet or packets of seed may be sown at once, and a succession be had by sowing more seed a month or six weeks hence. Raise in gentle heat, and treat the seedlings much as advised in the case of intermediates, only the earliest must be kept in a moderately strong heat till they are growing strongly, after which a shelf near the glass in a warm greenhouse will bring them along admirably. They can be had in full bloom early in May, the successional batch being at its best perhaps at Whitsuntide. Supposing more plants are raised with the rest of the border stocks, these would be amongst the first to flower, but it is for growing in pots that I must esteem this sturdy little early form. The ordinary ten-week forms raised under glass early in April and never checked, are worthy occupants of mixed borders, but are scarcely suitable for massing, unless those who plant them in that way are prepared with some kind of successional plants to succeed the stocks when they collapse in August. The new-pyramidal ten-week is superior to the ordinary forms, these, as a rule, producing finer spikes of bloom. Where white flowers are in demand, the comparatively new perpetual flowering types, of which Princess Alice is, as yet, the only representative, should certainly be grown. Raised with the ten-week and duly planted out on good ground, it will commence flowering by mid-summer, and continue gay till well into the autumn. This variety is of a somewhat tall weedy habit of growth, and pays well for staking upright. The greater proportion of the plants gives double flowers, and the spikes are very handy for cutting and packing. The East Lothians form a good natural succession to the ten-week forms, so also do the earliest flowering autumn varieties. Of the latter there are six distinct colours, and it is a question if they differ greatly, if at all, from the East Lothians. Any way they, they give a grand display during August and September, and are proof against all but the most severe frosts. These also should be sown late in March or early in April, and never neglected from the time they are up till they are growing strongly. The last to be mentioned are Brompton stocks. The old scarlet is still the favourite form, and I think the hardiest, but the white variety is also worthy of being grown extensively, packets of mixed colours being also distributed by most seedsmen. Late in June is a good time to sow the seed, the seedlings being duly pricked out on sheltered borders, fruit tree borders suiting them well, the slight protection there afforded them by the trees not unfrequently saving the plants from severe frosts. It is during May and June when these varieties are at their best.—*The Field*.

I. M. H.

### Garden of the Farm.

THE ONION.—This is a hardy biennial, and grown the hottest and coldest part of the country. It will thus be seen that we need not wait for mild weather to sow this crop, as frost will not destroy the young plants unless they are grown in an extremely damp position. It takes a long season to come to perfection, and it should always be sown as early in the

spring as the state of the ground will permit. At the present time the ground is much too wet for sowing any kind of seed, but two or three dry days would render the surface sufficiently dry to allow this crop to be sown. When successfully grown, this is a paying crop, as with good cultivation a large weight of bulbs can be produced from an acre of ground. Still, it requires a certain amount of skill to produce really good results. In the first place, the ground should be rich, firm, and fully exposed to sun and air, as the least shade from trees or walls will retard the growth of the plants and often cause them to grow thick-necked. These are unsaleable in market, and never keep for any length of time. The plan of growing these in 4 ft. beds has this advantage—they can be thinned and hoed without trampling among them, and as the beds are raised they are often dryer, hence they ripen better. Where the soil is at all light it should be trodden or rolled down firm before sowing the seed. Heavy soil should only be rolled when in a dry state. The distance apart between the rows will in a great measure depend on the sorts grown; for the largest kinds, 1 foot apart should be allowed, and 8 or 9 inches in the rows. The drills should be drawn as shallow as possible, only just deep enough to cover the seed. Drawing the drills deep often causes them to come up badly, and also produces many thick-necked onions. As soon as the plants appear they should be lightly hoed to keep down weeds, taken great care to only hoe the surface. Deep hoeing is never beneficial to this plant. Salt, soot, and lime-sown on the surface of ground, and raked in before sowing the seed, are useful as manure, and also as preventing the onion-maggot. In dry weather, manure-water may be given between the rows, but not late in the season, as they always keep best when ripened off early. Where they are well ripened I have never found the hardest frost injure the bulbs where kept dry. They can be kept till late in the season if hung up under a north wall, so long as rain cannot reach them. For growing good pickling onions, light, sandy soil is best, and the seed sown thickly, but not deep, as this would cause them to come thick-necked. As soon as ever the tops have decayed they should be pulled up and placed on a dry surface to ripen off. For an early supply, White Spanish is one of the very best, and for late James's Keeping is as good as any we have grown.

Mentmore, February 21st.

J. SMITH.

KITCHEN GARDEN.—The roots of shallots and garlic should be planted out before they begin to grow. These, like onions, prefer a firm, rich soil, although almost any ordinary garden soil will grow them; still, to have these extra fine, rich soil and an open, warm position is necessary. It is best to grow these in beds, and the rows may be 1 ft. apart, with the plants 9 in. in the rows. Where the beds of horseradish have been allowed to remain in the same place for a number of years the ground becomes exhausted, and the roots become tough and not fit for use. This is an excellent time to make a fresh bed. The old beds should be carefully trenched over, and all the roots got out, the crowns cut, the stems, and these planted in a fresh piece of ground. The deeper the ground, the finer the roots will grow; so where the ground is not naturally deep, it should be trenched at least 2 ft. deep, and a good dressing of rotten manure placed at the bottom of each



trench. When planting the crowns, make a hole with a dibber right down to the manure at the bottom of the trench and then drop the crown to the bottom of the hole, and lightly cover up. The crown will soon find its way to the surface, and being placed so deep, will increase the length of the part that is used of the root. Should any of the growths show flower during the summer, these are best cut off as soon as they appear.

(Eng. Ag. Gazette)

## Science.

*Science and Farming*—Professor Shutt on Chemical Science in Relation to Agriculture," is the title of a pamphlet kindly sent the editor of this Journal by the author. It contains the evidence given by Prof. Shutt before the Select Committee of the House of Commons in June 1892.

Mr. Shutt, while allowing that the marvellous "improvement in agriculture in England is partially due to competition and kindred circumstances," naturally attributes it principally to "the results of agricultural chemistry, as worked out by Liebig and his followers." The analysis of soils, carried on for the purpose of discovering their condition as regards plant-food has had much attention devoted to it. (1) The application of "muck," i. e., semi-decomposed vegetable matter, whether alone or mixed with farm-yard manure is described, and its average contents in nitrogen valued: "a ton of average muck in the air-dried condition, contains about 35 lbs. of nitrogen, worth, at 7 cents a pound, \$2.45." As a ton of ordinary dung contains about 8 lbs. of nitrogen, it follows that, other things being equal, a ton of average air-dried muck contains as much nitrogen as  $\frac{1}{4}$  tons of dung.

Mr. Shutt, in speaking of the fermentation of manure, takes the same view as the writer of this article has always held:

Q. You spoke of the compost heap. Is there no danger of having too much fermentation with the manure?—A. Fermentation can go on too far, it is like the decomposition that takes place in a manure heap. It should be stopped at the proper stage. The nitrogen, by excessive fermentation, might be converted into ammonia, and in that case will be for the most part lost. As long, however, as the heap is kept comparatively moist, I am convinced there is small danger of loss from the escape of ammonia.

### EXPERIMENTS WITH BARN-YARD MANURE

In that connection I am trying this year an interesting experiment, to answer the question whether there is any loss in fertilising ingredients by exposing the manure upon the field before ploughing it in. In the spring, farmers often spread their manure some days before they plough it in. The question has often been asked, whether during that interim there would not be some loss from the escape of ammonia. We have not data to enable us to answer that question definitely at the present time. I think a great deal depends upon the extent of fermentation to which the manure has arrived before being spread. Therefore, I have taken representative samples of manure at different stages of fermentation and analysed them accu-

(1) Prof. Penhallow, of McGill, agrees with us in holding that the analysis of a soil, as a means of discovering the elements of a manure that will suit crops sown on that soil, is useless. Ed.

rately. I have also spread on panes of glass these two samples, and am exposing them to the sun every day for a month, taking the precaution that they should not be subjected to any rain. I shall then analyse these samples again, and ascertain if there has been any loss of ammonia during that three month's experience."

We shall be glad to see the results of the above experiments.

A very interesting part of the pamphlet is the description of the analysis of fodder-corn at the various stages of its growth:

There is a regular increase in the amount of real cattle food, as the plant advances in growth during the summer until it reaches the glazing condition. That is very well brought out by the figures in the last column of the tables. We may consider the corn plant as consisting of two parts, water and dry matter. The latter, for our purposes, we will call cattle food. The water is of no commercial value. It makes the food succulent and palatable, but we cannot place any monetary value upon it as a constituent of cattle food. Therefore, granting that the loss of water does not impair the digestibility of a food, that sample of corn fodder will be the most valuable which contains the smallest quantity of water, and consequently the largest quantity of dry matter or real cattle food. We found that the yield per acre increased in weight to a certain stage, and decreased after that period. That decrease in total weight does not mean, as we have seen, a lessening in value; it betokens only a decrease in the percentage of water. During the whole period of growth of the corn plant until it reaches maturity it is laying up material that can be termed cattle food. It is the richest in the glazing condition. This, of course, points most emphatically to the value and necessity of allowing the corn to approach the glazing condition before cutting, for preservation in the dry condition, or storage in the silo.

Let us examine more closely the table for one moment. First of all, the yield per acre at the different stages of the four varieties is as follows: In the tasselling stage, 22 tons 1,329 lbs.; silking, 24 tons 52 lbs.; in the early milk stage, 22 tons 1,806 lbs.; in the late milk stage, 21 tons 759 lbs.; and in the glazing stage, 12 tons 1,154. Now we see there was an increase from the tasselling to the silking condition of nearly 2 tons per acre. It went from 22 tons 1,329 lbs. to 27 tons 52 lbs. but from the silking to the early milk condition there was a decrease from 24 tons 52 lbs. to 22 tons 1,806 lbs., and a still further decrease when we come to the late milk condition. That, at first sight, might indicate that the best stage to cut that corn would be the silking condition. But that would be altogether a wrong inference, because when we turn to the amount of dry matter, we see that it is increasing throughout. For, let us examine the pounds of dry matter per ton present in the different stages of growth. In the tasselling condition there was 285 lbs.; silking condition, 323 lbs.; early milk, 399 lbs.; late milk, 443 lbs., and in the glazing, 524 lbs. Therefore, these figures bear out my statement that the real cattle food increases in pounds per ton throughout the whole period of growth. Coming to the calculation of dry matter per acre, we have the following figures for the different stages of growth: Tasselling, 3 tons 468 lbs.; silking, 3 tons 1,770 lbs.; early milk, 4 tons 1,138; late milk, 4 tons 1,467 lbs., and glazing, 5 tons 1,293 lbs.

By Mr. Carpenter:

Q. You did not give us the relative value of the different varieties of corn you considered the best for ensilage purposes. Have you tested that? That is of great importance. Our object is to get information from you for our benefit.—A. In the first place, I can assure you that between one variety of Indian corn and another there is very little difference in the chemical composition, if we consider them at the same stage of growth. I have satisfied myself that the corn to grow for ensilage purposes is that which yields the largest weight per acre, arriving at the glazing condition before there is danger of frost. That is the whole thing in a nutshell. The climate of the grower's locality must be considered. We have found here that Pearce's Prolific and Longfellow come to the glazing condition before there is any danger from frost. The other two are later corns, and give a much larger yield, but in the vicinity of Ottawa do not mature sufficiently early, as a rule, to make good ensilage.

Mr. CARPENTER.—I am glad you have stated that, as a great many believe that there was a large difference between the varieties in their food value.

### ROOT FOODS.

I have yet to say a few words regarding another branch of fodder analysis. Samples of carrots, turnips, mangolds and sugar beets have been analysed to ascertain their relative value for feeding purposes. Roots form a very important ingredient of all cattle rations. Though exceedingly watery, and consequently not equal to hay or meal in feeding properties, they serve a very useful purpose in supplying a succulent and palatable food during the winter months. They are very easily digested, and, moreover, possess medicinal properties which assist in the digestion and assimilation of other foods. Roots are not rich in albuminoids (flesh-formers), and therefore are not a complete ration in themselves; for a properly balanced and economical ration, their use must be supplemented with other and more highly nitrogenous fodders."

The best preventive of smut in grain, according to Prof. Shutt, is copper sulphate; but care must be taken not to immerse the grain longer than momentarily in the solution; this should be made at the rate of 1 lb. of the sulphate to 8 gallons of water.

The spraying of apple trees with Paris green for the destruction of the codling moth caused a panic in the English fruit market. People were afraid of arsenical poisoning. Mr. Shutt made a careful analysis of some of the sprayed apples, and did not find a trace of arsenic. The report of the work published in some of the English papers allayed the fears of the consumers, and the market for Canadian apple is once more firm.

Mr. R. W. Shepherd, of Montreal, treated of apple-growing in the province. The profits are smaller now on account of the McKinley bill, and because Ontario floods Quebec with inferior fruit that will not pay for exportation to Europe. The Fameuse was not a paying apple for the foreign trade, as he had seen five fine Fameuses sold in Liverpool for a penny.

M. Auguste Dupuis, and others followed Mr. Shepherd, but the report in the evening papers of Montreal renders it very difficult to find out whether they did or did not recommend fruit-growing in the Eastern part of the province, though we feel pretty sure that M. Dupuis was favourable to it.

Monsieur Charbonneau, from Lake

St. John, said that the colonisation interests of the province were being neglected. Whereupon a special committee on that subject was appointed.

## Manures.

*Fertilisers for mangels.*—Some of the readers of the Journal may remember an article, published some years ago, on certain experiments made by the late Philip Pusey, M. P. for Berkshire, England on the manure best suited to the mangel crop. Pusey was really an agronomer, as the French style it, an educated practical farmer, as well as for some years, President of the Royal Agricultural Society. The conclusions he arrived at were that, after a certain amount of farm yard dung was given to the mangels, any addition, even up to the doubling of the number of the loads to the acre, had but a trifling effect; but, if to the ordinary dressing of dung 3 cwt. of Peruvian guano, containing 14% of nitrogen (17% of ammonia) were added, the produce was enormously increased. The soil on which the trial was made was a sandy peat, and two years previously, that is, before Mr. Pusey took the farm in hand, was utterly run out; we remember the district well, the subsoil was a nasty moor band through which the roots of plants could not penetrate.

The manures were used on 4 plots—not tiny ones, but 2 acres each—and divided as follows:

- No. 1.—Fourteen tons of dung;
- No. 2.—Twenty-eight tons of dung,
- No. 3.—Three (gross) cwts. of Peruvian guano—42 lbs of nitrogen,
- No. 4.—Three cwts. of Peruvian guano and fourteen tons of dung.

The yield of long red mangels from these dressings, on this really vile land, was:

No. 1 . . .	18 tons;
" 2 . . .	21 "
" 3 . . .	17 "
" 4 . . .	33 "

Without denying the utility of the phosphates and potash in the guano, we may fairly attribute the extra yield of No. 4 to the nitrogen it contained, as similar results have been obtained on the mangel crop from that constituent in nitrate of soda and sulphate of ammonia. So, we conclude that the addition of about 300 lbs. of nitrate of soda, or 400 lbs. of sulphate of ammonia to a fair dressing of good dung will produce a full crop of mangel, if the land has been well prepared for the reception of the seed, and the subsequent operations of singling, horse-hoeing and harrowing properly performed.

### Rye-grass.

M. Evans tells us he has genuine "Pacey's perennial rye-grass for sale, but no cow grass, as the latter was almost a failure in England last year.

Now, it must be remembered that *perennial* is a relative term. If *Pacey's* rye-grass is treated as it should be, we see no reason to doubt that it will stand as long as any grass that is not native to the country will stand. But, it all depends upon the treatment. If it is allowed to grow up for hay and to form its seed, its life will be short, and the native grasses will soon overpower it, particularly on light, dry sands; whereas, in moist districts, and on good heavy loams, it will live out for years, and, if invariably fed off by cattle, will prove to be truly perennial or everlasting.

In laying down permanent pastures, the cow-grass, or perennial red-clover, should always be used, as the common red soon dies out of a meadow. A

small quantity of white clover should be used; but the seed of this plant is so small, its tillering property so strong, and its hardiness so great, that two lbs. will be found sufficient for seeding an acre. Is white-clover a native of this country? It is found everywhere, along the grass-margins of our roads, and is so indomitable in its habit of growth, that if it be not an aboriginal it has proved itself to be a stalwart settler.

Potash is said to be a cure for that terrible complaint, "clover-sickness." Well, Sir John Lawes, who is supposed to have some ideas connected with cropping that are not absolutely unworthy of attention, positively asserts that he knows no cure for land that refuses to produce a crop of clover, except leaving the soil unsown with that plant for a certain number of years.

### Nitrogen in the Economy of Plant Life

Nitrogen forms an essential part of the food of plants, and the nitrogenous compounds in the grain, fruit, and vegetables, which in return supply aliment to animals, are the most important, as they are blood and flesh formers. Nitrogen forms four-fifths of the atmosphere, so that it exists in the free state in incalculable quantity, while in combination with various other elements, it is found in a solid form upon the earth.

Experiments made by Boussingault, and afterwards by Lawes and Gilbert, were understood to demonstrate that nitrogen could not be obtained by plants from the atmosphere direct. Seeds were grown in burnt earth, and the air and the water supplied were freed from ammonia, thus excluding nitrogen from the reach of the embryo plants. It was then shown that the plants would not grow readily, but when a solution of nitrate of soda was supplied to the shoots they developed with great rapidity. Thus, thirty or forty years ago, it was decided that plants did not get nitrogen from the atmosphere. There was, however, one curious fact observed, which stimulated further research. That fact was that plants of the bean, pea, and clover order, the seed of which is encased in a seed-pod or legume, did not prosper so well as grasses for instance, when grown in burnt earth, even with the addition of the solution of nitrate of soda. While wheat or barley, or grass would thrive marvellously when grown thus, the leguminous plants were but sickly, yellow, and stunted. On the roots of all leguminous plants curious swellings had long been noticed, and they had been termed tubercles. It was found, moreover, that without these tubercles the plants were sickly, but with them they thrived with characteristic rapidity. Hence the tubercles were a positive advantage. Directly this was known, the tubercles were examined with great care, and when the tubercles were put under the microscope they were found to be full of cells containing protoplasmic objects which were at once named bacteria. Now, why did the leguminous plants of Lawes and Gilbert prove so weakly when grown in burnt earth? When the experiment was again performed it was found that when grown in burnt soil the tubercles did not appear. Evidently, therefore, the tubercles were necessary to the prosperity of the plant! When this fact was grasped, the truth of the whole thing soon became known. It was observed that the tubercles were filled with fungi, marvellously small, which entered the

plant through the roots from the soil, running as fungi, such as mushrooms, are wont to do, and it was evident that the burnt soil was sterilised so far as the fungi were concerned, and, therefore, that they could not obtain a lodging upon the roots of the plants. Now, these bacterioids are charged with nitrogen, and, as young leguminous plants are found to have upon their roots at frequent intervals tubercles filled with the bacterioids, whilst the tubercles on older plants are empty shells, it follows that the nitrogenous food required by the plant is supplied to it from the tubercles. Thus, leguminous plants obtain nitrogen from the air, through the bacterioids. The bacterioids live upon the free nitrogen, and their carcasses are devoured by the plants. A very curious and interesting exception to a general rule is here evident. Nitrogen, in a form suitable for assimilation by plants, is a scarce and expensive substance. But the discovery just made shows the farmer how his soil may be stocked with the valuable plant aliment with the aid of the leguminous. Thus, if he grow clover upon a field and plough the whole crop under, he will in effect gather nitrogen from the air, and collect it in the soil for the nourishment of the succession crop of wheat. It has long been known that to grow beans, peas, or clover before wheat was a good thing. But only now do we understand the reason. It is advisable that all farmers on sandy land should pay special attention to this matter, for, by growing beans, peas, vetches, &c., frequently, they can greatly improve their soil. Again, this discovery is important to all who desire to convert sandy into arable ground.—SOUTHPORT VISITOR.

### Basic Slag for Roots and Pastures

In an able lecture on "The Rational Fertilizing of Field Plants," Professor Wagner, the eminent German chemist and experimentalist, bears emphatic testimony to the value of basic slag as a source of phosphoric acid. In numerous experiments conducted by him he has found it gives the most excellent results, not only with the root crops, but also on pasture land. He lays it down as a demonstrated fact that "in general, if you wish to enrich the soil and store it with a supply of phosphoric acid which shall serve for more permanent cultivation for fodder lands, meadows, vineyards, fruit gardens, &c., no phosphate is better adapted for this purpose than phosphate powder." In making this emphatic statement, the eminent savant was only confirming a fact which is now getting to be well recognised. Only the other day, there was published the results of a series of experiments conducted at the Bangor College, North Wales, by Professors Dobbie, Phillips, and Calchrist. These experimenters found that basic slag of first class quality was a very valuable and exceedingly cheap manure for the improvement of pasture land.—NORTH BRITISH AGRICULTURIST.

### Correspondence.

Fruit Culture in Gaspé and Bonaventure.

SPLENDID RESULTS.

Black Cape, 1st Nov. 1892.

E. CASGRAIN,

Dear Sir.—In reply to your letter of the 28th ult. I beg to state that

I commenced my orchard 16 years ago by setting out 50 apple trees, but, unfortunately, I lost 30 the first winter, they being girdled by mice. However, I was not discouraged, but continued setting out a few nearly every year or replacing those that had died. At present I have about 120 apple trees in my orchard.

The most profitable apple with me is the *Duchess of Oldenburg*; it never winter kills, bears when young, and bears abundantly. I have several *Tetofskys*, this is perfectly hardy, and is very fine flavored; Red Astrachan does fairly well with me.

I have also several *Fameuses*, they stand the climate well and do not scab. The Alexanders I have are hardy, but they are not very heavy bearers. I have also an apple called the Winter Bough; it is very hardy, bears well, and is a good keeper.

When I first planted my orchard I had an idea that I could not grow the better kinds of apple so far north, (48° 15') so I planted a number of crab-apple trees: now I grow more crabs than I can find a ready market for, but have no trouble to sell my large apples at good prices.

I have a small cherry orchard of the Richmond, I think, it was introduced from England a number of years ago. Cherries do very well in this locality. I have not experimented much with plums, except with the common blue plum but I intend to give plum culture more attention, and believe I can be as successful with plums as I have been with apples.

I consider this part of the country, Bonaventure and Gaspé Cos., well adapted to fruit-growing, especially on all lands that once bore hardwood. I have no nursery. The trees for my orchard I obtained principally from Tingley and McLane, Albert Co. New Brunswick.

I am so hopeful of making fruit-culture successful here that I intend setting out about 3 acres of apples and plums next year.

I am,  
Yours truly,  
N. JOHNSTON.

Jan. 14th 1893.

"If you possibly could put in your Feb. No an estimate of probable fair outgoing and incoming of a dairy farm, managed with the sole object of selling milk in Montreal, I should be very much obliged.

I will tell you exactly what I want to know.

Given a farm of about 120 or, 130 acres in the average condition of a Canadian farm, which I call bad, I do not speak now, of a highly cultivated farm on the Island of Montreal close to the City, but say, one at about the distance of my own from town, say, 15 or 20 miles by rail from Montreal, and supposing the farm to be equipped with suitable farm buildings.

1° What outlay would be required, for the purchase of cows, and how many to begin with.

The agricultural implements, and their cost; number of working horses. The best method to treat the land for this particular business, which is really a milkman's.

The milk only to be sold.

No calves to be raised, but, the cows as soon as dried off, to be sold to the butcher for beef.

Management best calculated to increase fertility and progressive improvement of the land, under these circumstances.

I can get some notes from a practi-

cal farmer, who is a milkman selling milk in Montreal, and having to drive it into town himself at least 7 miles. This farm is at Sault-au-Recollet, and he tells me that this sort of farming is the only thing that now pays at all.

The prices I have paid myself for cows with a shorthorn cross, bought from dealers at Point St. Charles, or on the Vigor Market, and weighing not less than 1000 lbs, and giving 6 gallons of milk, were from \$45 to \$60.

I have no record of how long they kept up this flow of milk, nor of what would have been a fair price for them to fetch as beef, as I never fed them as highly as the milkmen do who feed as highly as they possible can, fattening them all the time that they are giving milk, so that they can sell them as soon as dried off and buy another fresh cow with the price of sale. (1)

Yours, C. F. B.

### Seed Testing and Distribution of Seed Grain

TO THE EDITOR  
"JOURNAL OF AGRICULTURE"

Sir,

Knowing that farmers generally are much interested in the above subjects, permit me to place before your readers the following:

#### SEED TESTING.

The work of testing the germinative power of grain and other agricultural seeds is now in active progress at the Central Experimental Farm in Ottawa. Up to the present over 1,600 samples have been tested and reported on this season, and on the whole with very gratifying results, showing a good percentage of vitality. There are, however, some districts in the Dominion from which samples have been received of very poor quality and quite unfit for seed. In some parts of Manitoba the harvest season of 1891 was very unfavourable and considerable quantities of grain were left out in stock or stack all winter and threshed in the spring of 1892. A number of samples of such grain have been tested and they show a very low percentage of vitality, many of them ranging from 15 to 45 per cent. only, and are quite unfit for seed. In some other parts of the Dominion, and especially in some sections of Ontario and Quebec, the weather during the last harvest period was very wet, and the grain in the shock was subject to repeated wettings before it could be housed, and in the meantime some of it sprouted. A large proportion of such samples also show a low degree of germinating power, and, if used as seed, will be likely to result in poor crops.

Any farmers desiring to send further samples for test should forward them without delay; the packages should contain about one ounce each, and they can be sent to the Experimental Farm free through the mail. The samples are tested and reports can usually be furnished in about ten days after the grain is received.

#### SEED DISTRIBUTION.

Last year 16,905 sample bags of promising sorts of grain, weighing 3 lbs. each, were sent free through the mail to 9,114 farmers residing in different parts of the Dominion. This large quantity of grain, over 25 tons, was all of first quality and consisted of the

(1) Would one of our readers kindly answer these questions? We have no experience in milk-selling in this country. Ed.

most promising sorts which have been tested on the several Experimental Farms. By instruction of the Hon. Minister of Agriculture a similar distribution is now in progress for this year, and already over 3,000 samples have been sent out, and a large number are being mailed daily. The object of this distribution is to place in the hands of good farmers, in all parts of the country, samples of the best varieties of oats, barley, wheat, peas, &c., so that they may shortly be available for seed in every district in the country, and eventually result in the replacing of poor, mixed and enfeebled sorts, with varieties possessed of greater vigour in fertility. The number of samples sent to one applicant is limited to two in each case, and on this basis a very large number can still be supplied. With careful and judicious handling, these 3 lbs. samples will generally produce from one to three bushels the first year, and at the end of the second, the grower usually has seed enough for a large field. The advantages resulting from this large distribution of the best sorts of grain obtainable will no doubt in a few years be generally manifest in an improvement in the quality and an increase in the quantity of the average grain crops of the Dominion. A circular is sent with each sample, which the recipients are expected to fill up and return at the close of the season, with particulars as to the character and growth of the grain. The request is also made that a sample of not less than one pound of the product be returned to the Central Experimental Farm, so that information may be had as to the measure of success attending its growth. Samples are sent to applicants as long as the supply lasts. Letters can be sent to the Experimental Farm at Ottawa free of postage.

WM. SAUNDERS,  
Director Experimental Farm  
Ottawa, March 9th 1893.

#### Breeds of Pigs

Which kind of pigs is best to keep? Berkshire, Chester or Yorkshires?

*Answer.* The breeds named are all equally good, according to circumstances. The Yorkshires are generally preferred for bacon and for city markets, having more lean in proportion to fat.

20. At what age are those pigs finished growing?

*Answer:* They may be kept growing for several years, but it is hardly profitable to keep them, for meat, longer than from six to ten months. The sooner they are killed, under proper treatment from birth, the larger the returns, as the younger the animal, the less food it takes to produce a pound of increase; and the less fat produced in proportion to lean meat, the less the cost per pound.

#### Notes by the Way.

At last, Manitoba wheat, has been quoted in the market-list of the English Agricultural Gazette; the prices for that description of grain at Mark-dam, London, on the 9th January 1893 were given as: 31 s. to 32 s. a quarter, and Duluth wheat, the same day, seems to have realized 32 s. to 34 s.

Of Canada barley, in the year 1892, 27,846 bushels were sold, the produce of about one thousand acres.

#### New Cheese

BROCKVILLE, Ont., March 23.—The cheese season has already opened.

About half a ton of this season's make has been bought by D. Derbyshire at 11c. per lb. A local cheese buyer complains that factory brands are erased from cheese boxes in England, thereby enabling the importer to deceive his customers as to place of manufacture. He advocates stamping cheese, when in process of pressing, by raised letters in the press, thus producing in cheese, in letters which cannot be removed, the identical stencilled on the box.

#### The finest Cider.

Dom. M. Antoine, the very Rev. Father Abbot of Oka, among other things he mentions in a late letter from France, says: "We have sent you a cider crusher and press. I shall bring with me a few books, and all the necessary apparatus for a small pomological laboratory."

The cultivation of the cider apple, grafts of the best sorts of which the Revd. Father Abbot is bringing with him, will be pushed energetically by the brothers at Oka. This novel industry will be an immense advantage to our agricultural people.

#### Preserved fruits and vegetables

The factory of  
M.M. Michel Lefebvre and Co.

We lately paid a visit to the establishment of M.M. Michel Lefebvre and Co., at Montreal, manufacturers of vinegar, pickles, fruit-jellies and jams. There we found an agricultural trade being carried on, calculated to render great service to our farmers, if they know how to avail themselves of the benefits it offers. Unfortunately, the firm can only produce a very trifling proportion of the fruits and vegetables required for the supply of its immense factory from our own province, because the farmers almost entirely neglect furnishing what is wanted. The greater part of the supplies, therefore, must be necessarily purchased from Ontario, Manitoba, and Nova-Scotia. Last year, the firm paid \$2,500, for cucumbers alone, to Mr. H. S. Hurd, of Burlington, Ont., near Niagara, who had 63 acres devoted to this crop. M. Lefebvre used in his factory, last year, more than 800 tons of small fruit, such as strawberries, raspberries, plums, &c. Cauliflowers he gets principally from Ontario. The proprietor thinks that it would become a very lucrative business if our farmers would take pains to grow the best qualities of cider apples. Many of our farmers begin to see that small-fruit growing pays well, and have made contracts with the firm for the delivery of a certain quantity of fruit.

We cannot give too much encouragement to the manufacture of preserved fruits and vegetables, for it is calculated to become a most important branch of trade, not only for the supply of the home-market, but also for export abroad. DR.

(From the French.)

#### Peat fuel in the Province of Quebec.

Our attention is called to an article on this subject which appeared in the "Colliery Guardian" (Dec. 9). Our farmers are therein taken to task in a rather uncomplimentary manner for not taking better advantage of our vast and widely disseminated peat bogs, as fuel. This correspondent mentions what is being done in this line in Europe and elsewhere. If we are well informed, in Belgium and in Germany, where men work for one franc a day (20 cents) or less, comparatively very little peat is used even now, after numberless experiments and efforts both public and private. We beg to remind

those interested in this matter of the fact that very numerous experiments have been made, to our certain knowledge, in this province, some on a modest scale, others by companies which have employed regular civil engineers and sunk, in all cases, all they had put in such efforts. Many will remember the extensive and most intelligent work of Mr. Hodges, builder of the world renowned *Victoria Bridge*, and his company, backed up by the Grand Trunk RR., magnates of the time. Thousands of dollars, if not hundreds of thousands, were sunk in machinery of the best kind, in order to prepare fuel to replace coal. Great expectations were entertained, but all was useless, from the fact, still pregnant, that such fuel, under the best circumstances, is more costly than either wood or coal. Companies actually at work in Quebec and Ontario promise to do better and hope to deliver dried peat for fuel at, say, \$2.00 a ton. But we are not aware of any company as yet which is offering such fuel, as a regular article of trade, at any price.

We would beg to remind those who see nothing but apathy and ignorance in the province of Quebec, that on this matter of peat, for one, the *French Journal of Agriculture* published in May last a thorough study on the question of peat and its adaptabilities, and that experiments are now in progress respecting the preservation of fruit and vegetables, through peat, which are very likely so far unique in America. DR.

#### Fruit-trees.

##### A GOOD EXAMPLE.

M. Dupuis, nurseryman, of Aulnais, informs us that: "Mr. Frank Ross, president of Lake St. John railroad, has entrusted to me \$100, to be given in prizes for the best three orchards that shall be established this spring in the region of Lake St. John."

#### Profit from fruit-growing.

Mr. Du. bought 7 or 8 years ago from a nurseryman of the province, 6 plum trees. Five of them took. This year the five gave him 50 gallons of plums, which represent a return of \$5 a tree.

(From the French.)

#### The Vaccine Institute, Quebec.

The patient cow is not only our benefactor in her natural products but is put to an important use in this establishment in the production of vaccine.

The place is highly creditable to the pains taking director, E. Gauvreau, Esq., M.D. who is also a successful amateur in poultry, and has some fine specimens of Bramahs, Cochins, and Plymouth-Rocks. The former are his favorite for table fowls and he states that he kills them weighing 15 lbs. per couple, and on one occasion had a couple which weighed 18 lbs. Dr. Gauvreau considers the flavour of their meat surpasses all other—The Plymouth-Rocks, he justly considers the most profitable for laying and healthfulness, and the best all-round breed, everything considered.

The arrangement of the poultry-house is complete—No artificial means of heating are employed, but such arrangements made as will keep out the cold and admit the light.

The outer walls are all double and the roof is covered by a thick layer of sawdust. On one side, facing the yard, are windows, the whole length, by which the sun and light have free access. The Doctor prefers this to artificial heating, and says that during the

severest weather we have had, the food and water did not freeze; there is no doubt that fowls are more likely to become lousy in an over-heated building.

There was a freshness and sweetness in this fowl house which was quite noticeable, and the appearance of the birds proved that the treatment they received agreed with them, for their plumage was perfect, and their combs showed the prime condition they were in for laying.

There was nothing peculiar in the method of feeding—all the necessities of sand, lime, water, vegetables and meat being regularly supplied as recommended by poultry-men with the most advanced ideas. The Doctor says that he feeds Indian corn to those he proposes to kill for a few weeks, and finds that it gives a solidity and pliancy to the flesh.

The poultry-house is not extensive, but it is a model of cleanliness and comfort and the birds appreciate it, as their magnificent appearance shows.

Some beautiful horses of the pure Canadian breed, which are kept for business and family use, show the care and kindness lavished upon them and what our Canadian breed will become under proper treatment.

Fruit is also another favorite study of the Doctor's, and he has succeeded so well, with raspberries especially, that he proposes greatly to enlarge his plantation of them, and of some other fruits. He will thus be setting a good example to his neighbours, one which, if they follow, our home market will be better supplied and the advantage will be great to themselves and the public.

If Dr. Gauvreau succeeds as well with fruit culture as he does with the production of pure vaccine and with his poultry, he will do well, since it is evident that he possesses the qualities of carefulness, system, and attention to detail, which alone can make a good fruit-grower.

GEORGE MOORE.

#### A Well famed House.

Amongst the principal commercial firms engaged in the sale of musical instruments, Mr. L. E. N. Pratte, of Montreal, is the best place not only in Montreal, but through all the Dominion where to purchase a piano or an organ of Canadian, American or European fabric.

Owing to his reputation of honesty exhibited in all his transactions with his customers and to his practical knowledge of the instruments he sells, Mr. Pratte has soon seen with a legitimate proud his trade becoming prosperous and his firm occupying the first rank amongst the most important of this country in this line of business.

His customers comprises the most eminent artists, the first class families and almost all the religious institutions of the country. His name is as well known in the most remote parts as in the most populous cities.

This explains why we consider the musical store of Mr. L. E. N. Pratte as the most important as well on account of its popularity, the number and variety of sales made, as for the superiority of the instruments which he has so much contributed to have known and spread through all the community.

Any person wishing to purchase a piano or an organ, should not fail to pay a visit to Mr. Pratte's store to be made acquainted with his prices and conditions of sale which are most liberal. Mr. Pratte sends also, on application splendid illustrated catalogues.

# TO DAIRYMEN BABCOCK TESTERS

Whey Gates Centrifugal Separators

## DANISH AND ALEXANDRA STYLES

### POWER AND HAND

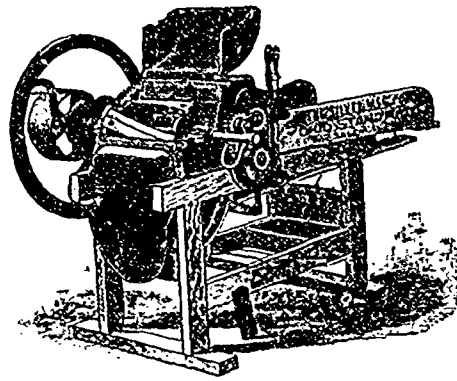
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Hay, Straw, Corn and Ensilago cutters of all sizes with or without Elevators Corn "Planters", Corn "Shellers", Churns, Seeders, Cultivators, Harrows Ploughs, all and every kind of Agricultural Implements used on or about a Farm. Also all kinds of Carriages, Wagons, &c., &c. All new and Im-

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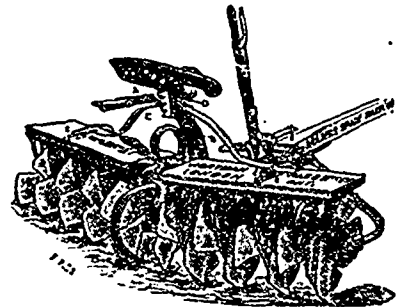
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We guarantee our press to work at the rate of 10 to 13 tons of hay every day without the horses being tired.

We manufacture four sizes of presses:

14 x 18      16 x 18      16 x 20      16 x 22

We will send this press free to any responsible party. Write for our Catalogue and list of prices.

PERPETUAL PRESS (Patent and improved)

The only one on the market, which the horses can run without their work being hindered.



The thrashing machine represented in the above engraving is our vibrating machine. It has a run of 28 inches long with teeth in steel guaranteed so that they can bend without breaking as the Norway.

The iron work that support the drills is all in wrought iron which is very advantageous and economical as any blacksmith can make it, so that all long delays are avoided.

The sieve of our vibrating machine is longer and wider than all the other machines of the same kind manufactured in Canada. This new shape facilitates the cleaning of the grain and the sieve is less exposed to spread its contents outside. We give seven faces with this sieve.

The horse power runs on cast iron rails all the shafts of the bridge measure an inch which represents half a line of a larger size than those employed by the other manufactures. All the shafts in the separator, the sieve and the horse power are in steel. We never use any iron shaft. Our machine is acknowledged to be the easiest to run and the one which lasts the longest.

Write for a catalogue and list of prices.

We also manufacture a Machine to work Cotton, Standing Hay Presses for Railroad, Standing Hay Presses with rod; Straw Cutter No. 9, 11, 13; Spring Harrows, 16 teeth; a Washing Machine patented May 1892.

We want active and responsible agents in all the localities where we have none yet.

Any farmer shall find it an economy and be certain to have the most improved machine in applying to us.

We allow a special discount for orders sent by mail.

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JOHN.—I am a member of the Farmers' Central Syndicate of Canada.



JAMES (his neighbour).—I am not.

JAMES.—You pay one dollar a year to the Syndicate and then? that represents a dollar less in your pocket.

JOHN.—This dollar yields me five other on a hundred, to say the least, if not ten or fifteen.

JAMES.—How is that?

JOHN.—To buy in retail cost dearer than in wholesale. The syndicate buys in the wholesale trade for me as for all his other members, and sells me the goods at the same terms as at the cost price. One thousand persons united together can buy more advantageously than a single one, can they not?

Besides, the Syndicate is at my disposal for any information I may want or any exchange, and before a long time elapse for all my sales. It is progress itself; it will soon be the most powerful Association in Canada. Do you understand now why I am in such good humour?

If you wish to be like me, write to

# THE FARMERS' CENTRAL SYNDICATE OF CANADA

30 St. James Street, Montreal.

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UNDER THE AGREEMENT WITH THE PROVINCE OF QUEBEC TO PROVIDE AGRICULTURAL SOCIETIES WITH STALLIONS.

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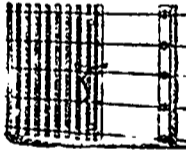
Season of 1892 : Number of services :

Napierville : 70.—Gaspé : 107.—Missisquoi : 79.—Vaudreuil : 37.—  
Chicoutimi : 37 —Three-Rivers : 55.—Bellechasse : 59.—  
Montreal : 104.—Ottawa : 106.—Nappan : 96 —  
Brandon : 39.—Indian Head : 63—  
Agassiz : 27.

Percentage of colts born in 1892 from the Haras National Stallions 70.74 %  
Percentage of colts, 1892, Haras of France . . . . . 54 %  
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## The Garrett Picket and Wire Fence Machine

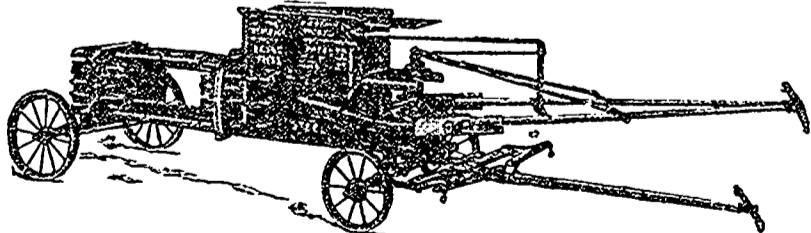


Weaves to the posts. A universal favorite. **THOUSANDS** in use. **GUARANTEED.** Freight and Duty paid. Agents are reporting big sales. Machines at wholesale direct from factory to Farmers, where I have no agent. For our Terms to Agents **CATALOGUE FREE.** Address the manufacturer **S. H. GARRETT, MANSFIELD, O., U. S. A.**

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Having bought out Messrs P. K. DEDERICK & CO'S. Branch Factory in Montreal with Plant and Stock and move to our works here. We are now prepared to Manufacture and Sell under Special Royalty

**P. K. DEDERICK'S PATENT HAY PRESSES.**  
Made in every Style in Wood Frame and Steel Cases. Also Repairs from their original Patterns.



Having also bought out the Dominion Wire Manufacturing Co's Bale Tie Plant with the transfer of that portion of their business, we are now prepared to supply all Styles of Bale Ties made from the Best Steel Wire.

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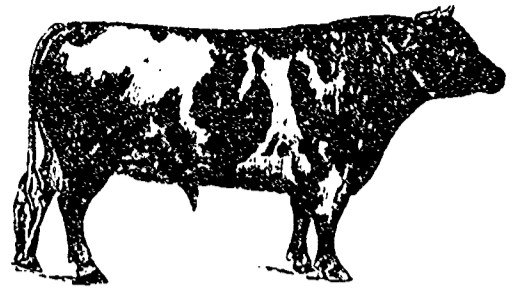
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Giving to customers cash discounts on orders. We alone catalogue that best of all bush beans, the Warren, and that best of all early peas, the Excelsior. No other seed catalogue of America or Europe contains so great a variety of several of the standard vegetables, and, in addition, are many choice varieties peculiar to our own. Though greatly enlarged in both the vegetable and flower seed departments, we send our catalogue **FREE** to all. The three warrants still hold good, and our customers may rely upon it, that the well earned reputation of our seed for freshness and purity will continue to be guarded as a most precious part of our capital. **J. J. H. GREGORY & SON, Marblehead, Mass.**

1893.



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**25 PRIZES.**

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