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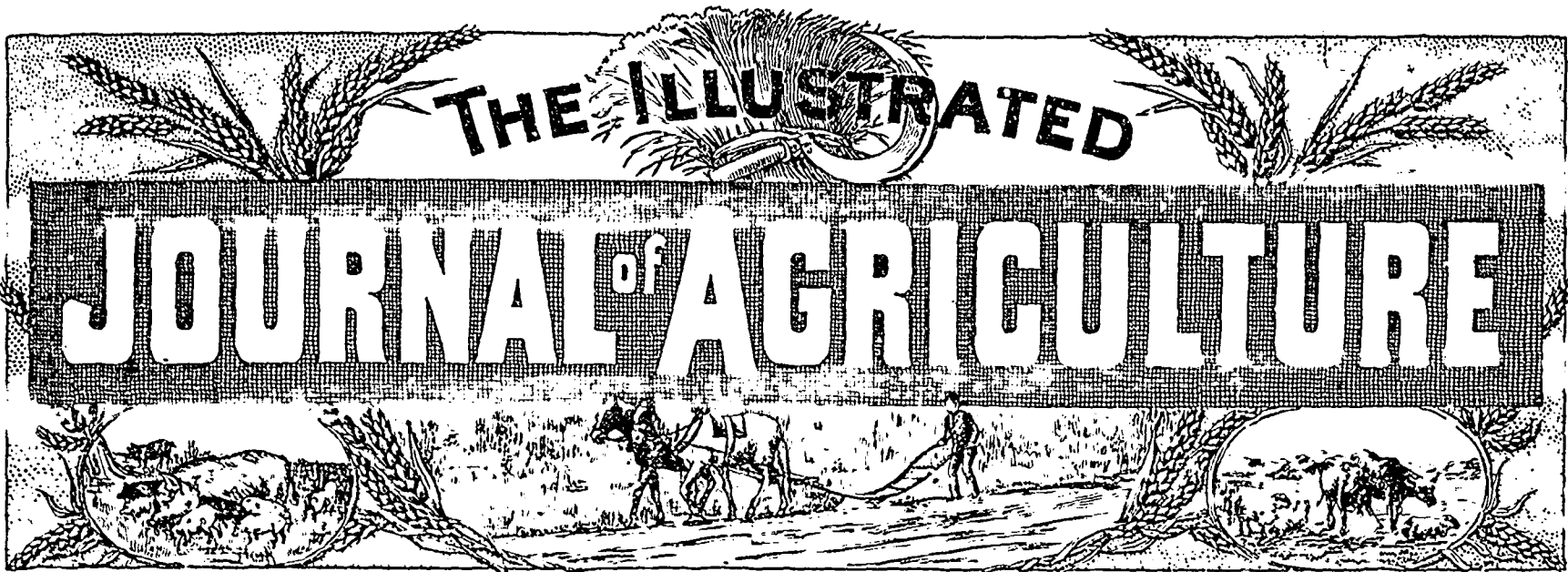
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Vol. 15, No. 5.

MONTREAL, MAY 1, 1893.

\$1.00 per annum, in advance.

PUBLISHED BY
EUSEBE SENEGAL & FILS,
 PROPRIETORS,
 20 St. Vincent Street,
 MONTREAL.

The ILLUSTRATED JOURNAL OF AGRICULTURE is the official organ of the Council of agriculture of the Province of Quebec. It is issued Monthly and is designed to include not in name but in fact anything concerned with agriculture, as Stock-Raising, Horticulture, &c., &c.

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

TERMS.—The subscription is \$1.00 a year payable in advance, and begins with the January number.

To Fruit Growers.

The attention of our readers is called to the advertisement of the Blymyer Iron Works Co., of Cincinnati, Ohio, which appears in this issue. Their Zimmerman Evaporators for Fruits and Vegetables have for many years been looked upon as the Standard Machines. Parties in want of Evaporating machinery will do well to write for their catalogue.

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Gold Medal Herd Ottawa, 1889 and 1890. First price and Diploma Herd Ottawa, Kingston, Quebec and Montreal, in competition with all the principal herds in Canada.

The Foundation cows in this herd are Jolie of St. Lambert, 6726, Canada Champion Milch Cow, 15 lbs. 13½ oz. butter, 48 lbs. milk per day.

Lady Fawn of St. Anne's, 10220, Victor Hugo's best daughter, 16 lbs. 12½ oz. butter 7 days, 47 lbs. 11½ oz. 21 days, 2,715 lbs. milk 28 days. When 15 years old.

Pot of St. Lambert, 5,123, 70 per cent. Victor Hugo. Dam of Oakland Nora, 23 lbs. 5 oz. of butter.

Dam of Diana of St. Lamberts, 16 lbs. 8 oz. butter. Hebo of St. Lambert, 5117, a daughter of Victor Hugo, great g. dam of Mary Anne of St. Lambert, 267 lbs. butter 1 year.

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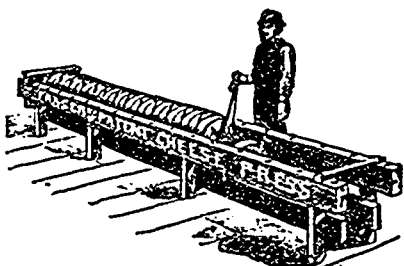
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THE ILLUSTRATED
Journal of Agriculture

Montreal, 1, May 1893.

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Notes by the Way.

4 Lincoln Avenue—
May 1st, 1892.

FOOD AND FAT.—English dairymen may be prejudiced in favour of their accustomed methods of feeding their cows, but, as proved by practice, they persist in believing that rich food produces rich milk.

WASTE PRODUCTS OF MAIZE.—The experiments made at the Vermont station, by Professor Cooke, go to show that with "cream gluten-meal," "sugar-meal," and "corn-germ-food," in comparison with a standard ration of bran and corn-meal, the former produced more milk in eleven cases out of seventeen.

They produced a richer milk—in increased percentage of butter fat—in fourteen cases out of seventeen.

SHEAF-OATS — "In one creamery herd, of which we have knowledge," says the Farmer's Advocate, "adding cut sheaf-oats to a ration of straw, clover-hay, and corn-silage, reduced the quantity of milk required to make a pound of butter from 18 lbs. to 15½ pounds. When the sheaf-oats were omitted in the ration, the old, lower average was resumed."

A SHORTHORN BREEDER'S OPINION.—Mr. Warfield, a shorthorn breeder of fifty years' experience, says in his treatise on stock :

"That one cow may be made to give as rich milk as another may not be possible; but by proper feeding, a cow may be made to give richer milk than when fed on improper food."

ALBUMINOUS MATTER.—Says Mr Horsfall, a very extensive milk-producer for the London market: Albuminous matter is the most essential element in the food of the milch-cow. "Any deficiency in the supply of this will be attended with loss of condition, and a consequent deterioration in the quality of her milk." Mr. Horsfall, like the writer, never omits pulse, i e horse-beans or pease, from the rations of his milch-cows.

Poor vs. rich food.—Will any one try the effect on the percentage of butter fat of the two following rations on a lot of cows in full flush of milk?

- Ration 1. Half a bushel of brewers' grains;
- " A bushel of mangels;
- " Straw at libitum.
- Ration 2. A bushel of carrots;
- " 12 lbs. of clover-hay;
- " 1 lb. of linseed (crushed and mixed with boiling water).
- " 4 lbs. of pease-meal or horse-bean meal if it is to be had.
- " 2 lbs. of corn-meal or barley-meal.
- " Straw at libitum.

SPRING.—On the 26th of April, we paid a long-promised visit to our friend M. Charles Bouthillier, of the Château Bleury, Ste-Thérèse. It was a refreshing sight to see the farm-work all in full swing again after the long-continued winter. The hillsides, on the lighter soils of Ste-Thérèse and Ste Rose, were turning up in capital order, and their rich, brown furrow slices gave promise of an earlier seed-time than one would have expected ten days ago. First bull-frog howled.

RAPE AND GRASS-SEEDS.—M. Bouthillier proposes to sow a four-arpon piece of "terre-noire," or bog-earth, with the following mixture of rape and grass-seeds :

- 5 lbs. of rape-seed;
- 3 " lucerne;
- 3 " red-clover;
- 2 " Alsiko-clover;
- 2 " white-clover;
- ½ bushel Pacey's perennial ryegrass;
- ½ " Orchard-grass;
- 4 lbs. timothy.

The land to be pastured by sheep—about the middle of July—receiving a pin. of oats and pease mixed per

diem, each. This ought to show something. The red-clover (Rawdon) must take the place of perennial red, or the true cow-grass, as the English crop of that clover—*trifolium pratense perenne*—was almost a thorough failure last year. The pasture will be chain-harrowed and rolled with a heavy roller as soon as it is perfectly under dry foot next spring, and no scythe will be allowed to touch it, only young cattle and yearling colts being allowed to graze it. The grass will be kept fed down closely, so that no seed-shoots spring up, and we shall see if a permanent pasture is an impossibility here or not.

HORSES.—"It is an outrage, the way some people whip horses," says Dr. Hoskins, in the Vermont Watchman; but it is a much greater outrage, say we, to see some brutes almost break horses' jawbones with the vicious jerks they give the bit. Many women are capital drivers, but much too fond of sudden snatches at the reins to make the horse move faster. Perhaps this comes in part from the impossibility they find in saying "Quick"—that queer sound a horse man makes between his tongue and his teeth, that the English groom asked his son to spell, when he came back from his first day at school, and would not let him go any more because he could not spell it.

BUTTER.—There is plenty of spring butter in the market, but most of it is poor stock, white and badly made. When shall we get good butter in Montreal?

TOMATOES.—If people will go on letting tomatoes sprawl about over the ground rather than grow them on the one-stem stake plan so often advocated by the writer, we suppose there is no way of stopping them. An experiment-station has been investigating this matter and finds that, while the total yield is not increased by pruning and staking, the crop ripens earlier and the fruit is much finer in size and quality than when the plant is allowed to lie loose on the ground.

PORK.—Pork and bacon are best made from pigs that have been fed fairly well during their growing time, and then fattened on barley- or corn-meal, skim-milk and pease. The tastes for slabs of fat, or for sinewy, hard lean-meat, are both exploded. Some of the old pigs from Sorel, &c., are a positive disgrace to their feeders.

AMERICAN FARMING IN 1893.—Mr. Rusk, the late United-States' minister of agriculture, draws a curious sort of picture of what farming in his country will be in 1893. The population will be about 300,000,000, which will demand a supply of grain-food equal to 1,500,000,000 bushels of wheat, or nearly 200,000,000 quarters, but as the cultivation of the land is to be vastly improved, this will only require for its production some 40,000,000 acres yielding 5 quarters, or 40 bushels, each.

The four acres required for the year's support of a cow, will be reversed, as four cows will be kept on the produce of one acre. Irrigation, wherever possible, and small farms intensively cultivated, will be the rule instead of the exceptions. Telephones, electric motors, every means and appliance of labour-saving, will be universally diffused, and that day-dream of dear, old Antony Trollope will be realised: a rural postman will daily deliver letters at the door of every farmhouse in the land. "The residents in the country will vie in culture and education with the corresponding

classes in the towns," and we all know that where culture sets its foot, the demon of cruelty to the subordinate animals soon has to spread its wings and take flight to its own abode in outer darkness.

FALL PLOUGHING.—The fall-furrows we saw at Ste-Thérèse had not been laid at an angle of 45°; consequently, they had been beaten flat by the snow and rain, and there was no crest for the harrows to catch hold of. That is why people "do not hold with fall-ploughing."

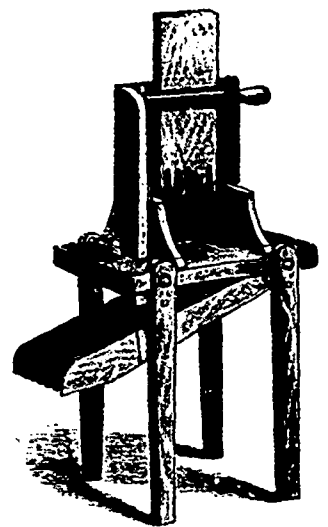
RAIN 78. FROST.—To-day April 27th, the rain has evidently made up its mind to wash the frost down out of the plough's way, so the season may not be so late, after all. If any one knows of a Dairy shorthorn bull-calf for sale, Mr H. F. Hunt of Villa Mastai, Quebec, would be glad to hear of it. But I fear there is not one to be found nearer than Darlington fair, Durham, England.

CUTTING SEED POTATOES

The engravings show (in perspective and horizontal plan) the construction of the Potato Cutter repeatedly advertised by the Aspinwall Mfg. Co.



of Jackson, Mich., for which it is claimed by the makers—and we have no doubt with truth—that "it cuts the potato and divides the eyes in a most satisfactory manner, and removes and cleans the seed ends, doing the work of eight men; it is easily operated by



a boy; it is also very useful in cutting beets, turnips and other roots for animals." Interesting circulars relating to potato and corn planting may be had of the company on application.

Country Gentleman.

CADET; HACKNEY-STALLION.

Our illustration this week is of the Hackney stallion Cadet 1251, which was sold some time ago for £3,000, as an eight-year-old, to go to the United-States. He stands 15.3 hands, and is a rich dark chestnut. He was bred by Mr. Henry Moore, of Burns Butts, Cranswick, Yorkshire, and was sired by Burnham's Lord Derby II. 417, out of Princess 289, by Bourdass's Denmark. He is now the property of Mr.

A. J. Cassat, president of the American Hackney Horse Society, of Ches-
torbrook, Berwyn, Chester County, Pa
Mark Lane Express.

A CAB-DRIVER'S
PRESENCE OF MIND.

"What might have been a most se-
rious accident occurred on St. Denis
street, yesterday afternoon. A car was
coming down the very steep grade be-
tween Sherbrook and Ontario streets,
when the brake suddenly broke. For-
tunately, the driver did not lose his
head, but realising the position, he
whipped his horses, at the same time
calling out loudly to people to keep
off the track, and thus safely reached
the level below Ontario street. The
fright of the passengers may easily be
imagined."

The above extract from the Mont-
real Witness reminds us of an instance
of presence of mind that occurred on
the Epsom racecourse the year "Merry
Monarch" won the Derby — some-
where about 1847—We were standing
near the Grand Stand, when a four-
in-hand drag drove up loaded with
passengers from some City-tavern or
other. Just as the horses came to a
stand-still, the off-side leader slipped
on the short, dry turf; down he went,
dragging the other leader with him;
a scramble ensued; the two gained
their feet again, but found themselves
on the near side of the near-wheeler;
another scramble, down again, and,
reversing their former exploit the two
leaders passed back under both wheel-
ers and appeared all right in their
proper places. The coachman, an old
hand evidently sat on the box perfect-
ly unmoved, knowing that any inter-
ference on his part was useless
"Well," we could not help exclaim-
ing, "you have got nerve!" "Shouldn't
I have no business here, Sir, if I hadn't,"
was his quiet reply. Any one who has
seen a Derby crowd, on a fine last
Wednesday in May, will understand
the value of nerve on such an occasion.

The Council of Agriculture.

DELIBERATIONS

OF THE

COUNCIL OF AGRICULTURE;

APRIL 11th AND 12th, 1893.

The Council of Agriculture met, in
its usual hall, on Tuesday April 11th,
1893, at 10 A. M.

Were present: The Hons. H. G. Joly
de Lotbinière, A. C. P. R. Landry, F.
X. O. Méthot, G. Ouimet; The Révds
G. Montminy, and R. Tremblay,
MM. Milton Macdonald M. P. P., Jos.
Girard, M. P. P., Andrew J. Dawes,
Ora Patten, H. S. Foster, R. Ness, C.
D. Tylee, J. de L. Taché, Wilfrid Gri-
gnon, I. J. A. Marsan, B. Lamarro.

The deliberations of the last meeting
were read and approved.

Proposed by the Hon. F. X. Méthot.

Resolution 1:—The Council regrets
that the Societies of Agriculture
should not have been informed of the
nomination of directors made by the
Council at its meeting of the 23rd
January last, and invites the attention
of the Hon. Commissioner to the im-
portance of notifying the said societies
at once; and it is resolved that the
Secretary of the Council instruct the
Agricultural Societies to notify the
directors named by the Council of the
meetings of the board of directors of

these societies, in order that, if they
think fit, they may attend them.

Resolution 2:—In virtue of the
power granted to it by the subsection
3 of article 1601, of the R. S., the Coun-
cil approves the following part of the
agreement made between the govern-
ment and MM. Sénécal et Fils, on the
second of December last, for the publi-
cation of the Journals of Agriculture;
and it binds the societies concerned to
conform thereto, to wit:

"The government engages to pay
to MM. Sénécal et Fils, out of the an-
nual grant to the different agricul-
tural institutions which shall receive
the said Journals, or out of the sum
of fifty thousand dollars appropri-
ated to the payment of the allocations
of the Agricultural Societies (Art
1667, R. S. P. Q.), at choice, the yearly
sum of thirty cents for each person
whose name shall have been trans-
mitted to the said publishers by the
Commissioner of Agriculture, and to
whom one of the two Journals shall
have been addressed for one year."

The subscription of thirty cents
SHALL BE PAID on the 1st of Septem-
ber in each year, BY EVERY AGRICUL-
TURAL SOCIETY, as well as by the
Dairy-men's Association of the Pro-
vince of Quebec.

Resolution 3:—The questionnaire
which is to be submitted to the Agricul-
tural Societies and the Farmers' Clubs
was read and adopted. The President of
the Council and the Assistant-Commis-
sioner were requested to revise and
condense it, and to superintend its
printing and distribution.

Resolution 4:—The secretaries of
the Agricultural Associations aided by
government are empowered to read,
at the board of directors, every circular
received from the Department of
Agriculture, at the session that shall
immediately follow the receipt of the
said circular, and to mention in the
report of the said session the reading
of the said circular.

Resolution 5:—Seeing the difficulty
of obtaining from the agricultural
associations the information required
by the Council and by the Department
of Agriculture, the Hon. Commis-
sioner of Agriculture is requested to
apply strictly to the associations in de-
fault the provisions of articles 1662
and 1662 of the revised statutes.

Resolution 6:—That instructions
be given to the Secretary of the
Council to notify at once the
Societies of Agriculture situated with-
in the limits of the fifth region of
the Provincial competition of Agri-
cultural Merit that they are strictly
obliged to hold this year a county or
parish competition of the best culti-
vated farms.

Resolution 7:—That in article 136
of the regulations of the Provincial
Competition, the word "fifty" be
substituted for the word "sixty."

Resolution 8:—That the Agricul-
tural Societies of Lake St. John, those
of Charlevoix, division B, of the Sagu-
nay, and of Chicoutimi be excused this
year from paying in money the prizes
fixed by the rule 114 of this Council,
for the competition of the best culti-
vated farms, that they are obliged to
hold, and that they are at liberty to
substitute for these money-prizes *Hono-
rable Mentions*, provided the sum
represented by the amount of these
prizes be expended in the purchase of
breeding stock.

Resolution 9:—That the Agricul-
tural Society of Charlevoix, Division
B, be placed on the same footing as
the Agricultural Societies mentioned
in the 20th resolution passed at the
last session, and that it be allowed, for
this year alone, to use its subscriptions
for the purchase of seed-grain.

Resolution 10:—That article 111 of
the Regulations of the Council be
amended by the striking out, in the
fifth and sixth lines, the following
words: "at least once in five years."

Resolution 11:—That article 115 of
the Regulations of the Council be
amended by striking out, in the sixth
line, the words "be at least two hun-
dred and fifty dollars," and adding at
the end of the said article, the follow-
ing words: "rise to the amount fixed
upon for each society, by the preced-
ing article, in proportion to the amount
of their grant"

Resolution 12:—That article 116 of
the Regulations of the Council be
amended by striking out, in the third
line, the words "which shall not be
less."

Resolution 13:—The request of the
Agricultural Society of the Saguenay
asking for what follows is granted,
except the third item which is refused:

Bonus or aid for the carriage and delivery of grain.....	\$150.00
1. For the payment of debts incurred last year.....	100 00
2. Care of the Society's stallion.	100.00
4. Fifty dollars for incidental expenses.....	50.00
5. Aid for the establishment of two cheese-factories in dif- ferent parts of the county...	200.00
6. Construction of two siloes where the cheese-factories are to be built.....	50 00

Resolution 14:—That neither the
Agricultural Society of Arthabaska
nor any other society has any right to
exact a subscription of more than one
dollar, neither has it, in the awarding of
prizes to herds, a right to give pre-
ference to one race of cattle over the
other races.

Resolution 15:—That the minutes
of the deliberations of the Council of
Agriculture be printed and distributed
to the members of the Council within
the fifteen days following each session.

Resolution 16:—That a committee
composed of the Hon. F. X. Méthot,
MM. Marsan, Ness, Dawes, and Joly
de Lotbinière, be desired to study the
programmes of the Agricultural So-
cieties, and to point out the modifi-
cations and improvements that should
be made therein for the progress of
agriculture, and to report thereon at
the next day's session.

Resolution 17:—That a committee
composed of the Revd. M. Montminy,
MM. Grignon, Tylee, Macdonald,
Girard and Taché, with M. Gigault, the
Assistant-Commissioner of Agriculture,
be requested to prepare the Regu-
lations for the guidance of the Farmers'
Clubs, and to report thereon at the
morrow's session.

Resolution 18:—That the agricul-
tural societies of Hochelaga and
Jacques-Cartier be authorised to com-
bine a part of their funds, up to \$30.00
each, for the purpose of holding a
ploughing-match among the members
of the united societies.

The Council then adjourned; at
6 p. m., to the next morning at 9.

The Council met at 9 a. m., on
the 12th.

Resolution:—The following report
of the committee appointed to prepare
the Regulations of the Farmers' Clubs
was adopted:

Resolved that article 53 of the Re-
gulations of the Council of Agriculture
be applicable to the Farmers' Clubs,
settling the total value of the division
(distribution) at an amount that shall
not exceed the subscription of each
member, except in cases entirely
special, of which the Council shall be
the judge.

That if the clubs think it useful to
hold a competition of the best culti-
vated farms, the clubs shall be bound

to offer not less than five prizes; to
wit: first prize, \$5.00; second prize,
\$4.00; third prize, \$3.00; fourth prize,
\$2.00; fifth prize, \$1.00. Any club
shall be at liberty, however, to give
higher prizes. These prizes shall be
payable solely in books on farming, or
in agricultural implements of the
improved type, or in superior breed-
ing-stock, or in seed-grain; according
to the decision of the directors.

Any member of a club who, before
the 1st May, shall have paid his
subscription, of one dollar, and an addi-
tional special entry-fee of 25 cents,
shall have a right to contend in the
competition of the best cultivated
farms.

The following report of the com-
mittee named to study the programmes
of the agricultural societies, and to
recommend the modifications and im-
provements therein to be made, was
read, and its consideration was deferred
to the next session.

REPORT.

Report of the committee appointed
to study the programmes of the agri-
cultural societies, and to point out the
modifications and improvements there-
in to be made in the interest of agri-
cultural progress:

Your committee submit the annexed
rough draft of a programme (borrowed
from the Provincial Competition of
Agricultural Merit, with some modifi-
cations) for the county or parochial
competitions for the best cultivated
farm. It classifies the matters that may
form the subject of the competition
under 16 different heads, endeavouring
to assign to each the number of marks
proportionate to its importance.

Your committee advises that to
onsilage and siloes be granted a num-
ber of marks that, at first sight, will
appear exaggerated; but too much
cannot be done for the encouragement
of the Dairy-Industry.

Without insisting too strictly on an
absolute observation of all the regu-
lations of your Council, the committee
recommends that the Agricultural
Societies be bound to conform to the
regulations No. 85, as to the compe-
tition of pure-bred animals, and the
amount of the prizes that are to be
assigned to them, as well as to the re-
gulations No. 81, which forbids the
offering of prizes, in future, for male
breeding-stock, unless they belong to
pure races, and be registered, in the
cattle, sheep and pig classes.

In some of the programmes, your
committee found that prizes were
offered for quantities of products too
trifling to give any just notion of their
real value. It would recommend, in the
case of these prizes being offered, the
following quantities as the minimum:

2 bushels for all kinds of grain
(wheat barley, oats, pease, buckwheat,
maize, rye, &c., &c.)

Timothy-seed.....	1 bushel:
Clover ".....	1 "
Potatoes.....	1 "
Turnips.....	1 "
Carrots.....	1 "
Beans.....	1 "
Onions.....	1 "
Apples.....	1 "
Silage.....	18 oars
Silage-maize.....	10 "
Tobacco.....	5 pounds;
Cabbage.....	5 heads;
Maple-sugar.....	10 pounds;
Maple-syrup.....	1 gallon;
Honey-comb.....	5 pounds;
Strained honey.....	1 quart;

and other non-enumerated objects in
the same proportion. All these must
be the product of the year in which
they are exhibited. The competitor

must give the name of the cereal or vegetable he exhibits.

Your committee recommends the Council to insist upon the societies sending in their programmes at the time fixed by the law.—Art. 1659 of the R. S., so as to give the minister of Agriculture time to examine them, and to correct them if needed; and it recommends that these programmes be not finally printed, until they have been approved by the minister.

Quebec, April 11th, 1893.

PROGRAMME.

Details of the composition, and basis of the assignment of marks. Art. 130. Marks common to all competitors:

	Number of marks.
1. System or rotation best suited to the soil and circumstances.	4
2. Division of the farm.....	2
3. Fences.....	4
4. Destruction of weeds ...	3
5. House.....	2
Barn, cowhouse, buildings....	4
Silo.....	3
6. Implements and tools.....	4
7. Manures	6
8. The highest degree of order, method, and care, as shown by the entirety of the work, and the state of each part....	5
9. Accounts (expenditure and profits)	3

Marks subject to modification according to different cases:

10. Permanent improvements : connected with the special circumstances of each farm (the apportionment of those marks to rest with the judges) such as : stone clearance, utilisation of the stones, leveling, straightening of water-courses, water-furrowing, drainage, ditches, "mondments" to the soil as clay to sand, and sand to clay, turf, ashes, &c., ploughing in of green-crops, shelter for cattle, planting forest-trees for shelter and other purposes, condition and improvements of the sugary, when there are maples, economical and satisfactory drinking accommodation, siloes, state of the competitor's farm-road, and any other profitable improvement.....	15
11. Cattle. Kind, breed, quality suitable to the land, climate, markets, and other circumstances that guides the sensible farmer in his choice, and shall guide the judges in their decisions, (under this head are included horses, cattle, sheep, pigs, poultry, &c.....)	5
12. Proportion between the extent of the farm and the number of head of stock kept	4
13. Degree of care expended in the keep and feeding with regard to profitable production.....	6
14. State of cultivation : grain-crops, meadows, pastures, green-fodder, hoed-crops, orchards, gardens, small fruits, (assignment of those marks rests with the judges).....	20
15. Maize, standing, for green-meal, and for silage, not less than 2 arpents.....	5
16. Other fodder for green-meal or for silage, not less than 2 arpents.....	5
Total marks.....	100

Resolution 20:—Considering the great value of onsilage for the production of the best milk during winter, every effort should be in future made to ensure competent judges in the examination of the siloes to whose owners prizes are to be assigned. In the selection of judges, let it be ascertained beforehand that they are acquainted, in detail, with the best mode of building a silo, and with the most paying way of giving silage to the stock. Lastly, in places where there are no competent judges of these things, the societies should ask for such judges from the Department of Agriculture at Quebec.

Resolution 21:—The Council invites the attention of the Agricultural Societies and the Farmers' Clubs to the profits that arise from growing tobacco, and it advises tobacco growers to take particular pains with its drying, preparation, &c.

The Council hopes that the Agricultural Schools at Ste-Anne and l'Assomption will grow this crop, and teach its cultivation to the pupils.

Resolution 22:—The Council learns with pleasure that the Minister of

rowed barley recently imported from Europe. He was requested to put his ideas on the subject in writing, for the benefit of the farmers.

Resolution 27:—The Council sees with pleasure the establishment in this province of Farmers' Syndicates which are called upon to render important services to the agricultural class.

The Council then adjourned—*sine die*—at noon.

Certified copy,

ED. A. BARNARD,

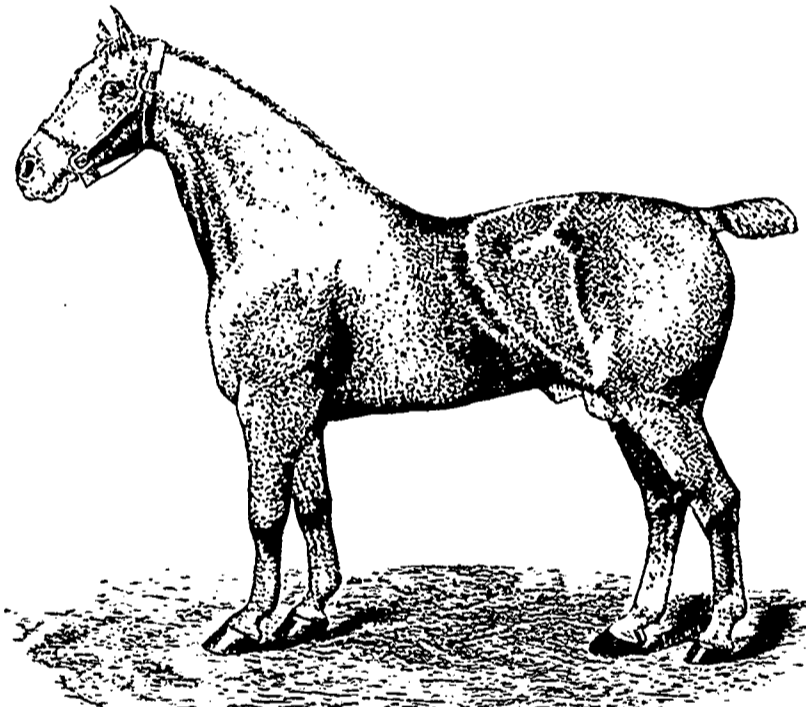
Secretary of the Council of Agriculture of the Province of Quebec.

Competition of Agricultural Merit.

(Continued.)

No. 27.—P. LABEL.

On the 8th of September, 1892, we inspected the farm of M. L. Philippe Label, of New Carlisle, Bonaventure County. The farm contains 60 acres, including the pasture on his farm in



THE HACKNEY STALLION, CADET.

BRED BY MR. HENRY MOORE; AND THE PROPERTY OF MR. A. J. CASSAT.

Agriculture intends to open a competition for the best manual of agriculture for the country schools.

Resolution 23:—The Council of Agriculture notices the request of M. Labolle, of St-Jérôme, concerning the prizes awarded to the Jersey-Canadian cattle at the last Provincial Exhibition at Montreal; its consideration is deferred to the next session, as the Council wishes to have the report of the judges, and all other necessary information, before giving its decision on the subject.

Resolution 24:—That the question of the employment of commercial fertilisers be referred to the Committee on the Provincial Competition of agricultural merit, with instruction to report at the next session.

Resolution 25:—The Minister of Agriculture has given an account of his negotiations with the railroad authorities for the purpose of obtaining a reduction of the freight of commercial fertilisers; and the Council learns with pleasure that there is every prospect of a considerable reduction being made in the freight of these manures.

Resolution 26:—Mr. Dawes drew the attention of the Council to the bad results obtained from the crops of two-

the second concession, an acre in orchard, and a garden 350 ft. by 150 ft. The soil is sandy and requires frequent manuring.

M. Label's rotation is as follows : First year, wheat, oats, potatoes. Second year, after wheat, potatoes with compost of sea-weed and dung ploughed in; after oats he repeats oats without manure, and grass-seed for pasture. Third year, after potatoes, wheat with grass-seeds, left in meadow 3 to 5 years, and in pasture for 3 years. The system is defective, because not all the ploughed land gets manure, and we therefore deduct 2½ marks from the total. We advise M. Label not to plough more land than he has manure for.

The division is perfect and the fences in good order.

The meadows, pastures, and hoed-crops are free from weeds.

The house is good and suited to the needs of the family.

Barn, stable, cowhouse, piggery, wood and carriage-house, harness-room, and workshop, are all handy, and fit for the wants of the farm. There is a magnificent silo in the barn.

The implements are sufficient in

number, of good kinds and well taken care of; the increase and preservation of the dung are very satisfactory.

General order good.

M. Label keeps no books.

Permanent improvements satisfactory, as may be seen by the marks adjudged. Stock: a brood-mare, 1 workhorse, 1 foal; 1 Ayrshire bull, 4 cross-bred cows, 4 fattening beasts, 2 2-year-olds, 1 yearling, and a calf; 1 ram, 8 ewes, 3 cross-bred lambs.

Crops: 2 acres of very fine wheat, 1½ of very fine barley, 8 acres of middling oats, 2 of gabourage, 1½ beans, ½ of swedes, 2 of potatoes, 2½ of very fine silage-corn, 10 in meadow, 21 in pasture ¼ in orchard, (An acre given above. Ed.), and a very well managed garden of 350 x 150 feet.

We gave M. Philippe Label 80.80 marks, which entitles him to a bronze medal and a diploma of Great Merit.

No. 28.—M. GEORGE LABEL.

The 31st. of August, 1892, saw us at the farm of M. George Label, Gacouna, Témiscouata County. This farm has a superficies of 90 arpents under the plough, ¼ in orchard, and a garden of 40 x 60 feet. The soil is mostly sandy, with some bog-earth.

This is M. Label's system: First year, wheat, barley, peas and oats, rye, with seeds, partly manured, partly unmanured. He manures about 5 arpents, including 2 arpents of potatoes on the sandy land, after which comes wheat. He mows 4 or 5 years, and pastures 2 or 3 years. He manures about 5 arpents a year, and the rest gets no manure. We do not approve of this, so M. G. Label loses one mark. We advise M. Label not to plough more than he can manure and enrich in the course of the rotation.

There is perfect intercommunication between the different pastures and the buildings.

Some weeds we found, and therefore deducted ¼ of a mark.

The house is very well suited to the requirements of a farmer's family.

Barn, stable, cowhouse, sheepshed, henhouse and piggery, most suitable, and well adapted to the economical care of stock. M. G. Label makes excellent butter; the milk is kept in cans in the ice-house attached to the dairy.

Implements are in good order and nearly sufficient in number.

Preservation and increase of the manure perfect.

General order, good everywhere.

Accounts well kept, and full marks, three, allowed for this item.

Permanent improvements satisfactory.

Stock: 1 brood-mare, 3 work horses, and a 2-year-old colt; 1 bull, 15 cows, 2 2-year-olds; 1 ram, 12 ewes, and 13 lambs.

Crops. 4½ arpents of wheat, 2 of barley, 23½ of oats, 3½ of potatoes, 23 in meadow, 34 in pasture, ¼ in orchard, and a garden 40 x 60 feet.

M. G. Label earns 80.20 marks, and is therefore entitled to a bronze medal and a diploma of Great Merit.

No. 24.—M. CALIXTE MICHAUD.

We visited, on the 1st September, 1892, the farm of M. Calixte Michaud, of Isle Verte, Témiscouata, containing 84 arpents, 75 of which are arable, 1 not arable, 8 in bush, with a garden 100 x 80 feet. The soil is partly sandy, partly heavy land, and the rest bog-earth.

Rotation: First year, wheat, oats, and rye, barley with seeds, potatoes. Second year, after potatoes, wheat with seeds and dung ploughed

in. He mows his meadows 4 years, and pastures them 4. Ten arpents are manured; where there has been no manure, he plants potatoes with dung the following season. The rotation is pretty good, we however deducted half a point from this item because M. Michaud does not manure all the land he ploughs.

Division of the land good, and the fences in good order.

Fields free from weeds.

House good, and suited to the comfort of the family.

Barn, stable, cowhouse, granary, cart-lodge, all in good order. Here, we saw a magnificent ice-house with a really model dairy, the cost of which was only \$50.00.

The implements were well kept, and almost enough of them.

Manures well preserved, and increased by the addition of lime and bog-earth, general management, good all over.

The book-keeping was by no means what it ought to be, we therefore deduct $\frac{1}{2}$ marks out of 4.

Very little permanent improvement was needed here.

The stock, partly Canadian was: 2 brood-mares, 1 workhorse, 1 3-yr-old colt, and 1 yearling; a bull, 16 cows, two of which are pure Canadian; 4 fattening beasts, 2 2-yr-olds, and 4 calves; a ram, 19 ewes, and 20 lambs. All these are partly pastured, and wintered with the pasture and hay, on another farm some distance off.

Crops: 10 arpents of wheat, 1 of barley, 10 of oats, 9 of mixed oats and rye, $\frac{1}{2}$ of goudriole, 6 of potatoes, 10 in meadow, 30 in pasture, and a garden 100 x 30 feet.

M. Michaud obtains 79.90 marks, which entitles him to a bronze medal and a diploma of Great Merit.

No. 30.—MR. SAMUEL EDWARDS.

We found the farm of Mr Samuel Edwards, Inverness, Megantic Co., which we visited 6th July, to contain 200 acres, 45 of which were arable, 45 in permanent pasture, 35 in bush $\frac{1}{2}$ in orchard, and a garden of 20 x 30 feet. The soil is very rich, with a porous subsoil. Mr Edwards' system of farming is perfect: First year, oats, pease, sometimes wheat with interred dung, and dunged potatoes. Second, after potatoes, wheat or barley with seeds, after pease, hoed-crops with dung. Third year, after hoed-crops, wheat or barley with seeds: 2 gals. of timothy and 4 or 5 lbs. of clover to the acre. Meadow 3 to 4 years, pasture 2 years.

The division of the farm and the fences, good. One mark deducted from the item of freedom from weeds, as we saw a few ox-eyed daisies.

Buildings capital, except the house which is not in good order. Barn, stable, and cowhouse, economically arranged and suitable to the needs of the farm.

Implements nearly complete; only one mark deducted from this item.

Preservation and increase of dung perfect: maximum points for this item.

Full marks for general management.

No books kept. Permanent improvements satisfactory; six arpents of stone-fence, admirably built; one part of the land, at the bottom of a slope, is drained by an underground drain 4 arpents long.

Stock 2 half-bred Clydesdale brood mares, 1 workhorse, 1 3 yr.-old colt, 1 2 yr.-old do.; 7 cow 10 fattening beasts, 2 3-yr.-old beasts, 2 yearlings; 3 calves; 14 Leicester ewes, 5 lambs.

To Mr. Edwards we gave 79.60 marks, so he wins a bronze medal and a diploma of Great Merit.

No. 31.—M. ONÉSIME LUPIEN.

On the 17th of August, 1892, we inspected the farm of M. Lupien, of St. Valère, Bulstrode. It contains 200 arpents: 150 under crop, 50 unploughable, and a garden 50 x 75 feet. The soil is partly alluvial, but the majority is black earth with a clay subsoil.

Rotation: First year, wheat, oats, buckwheat with seeds, 2 gals. of timothy with 2 or 3 lbs. of clover to the arpent, potatoes and other roots with manure. Where he sows wheat and oats, he puts dung on the furrow and works it in with the harrow, or ploughs it in. The reason he sows so much grain is, that in some spots, the layer of bog-earth is thick, and this gives him a chance to burn it.

The division of the farm is sufficient. The fences, partly of wire, are also good.

The fields are well seen to, and free from weeds. The house is suitable to the wants of the family.

Barns, stable, cowhouse, sheepshed, are convenient enough, but not fit for so large a farm.

Implements well cared for and plenty of them.

The order and care observable in the buildings are hardly sufficient.

M. Lupien keeps no books; we gave him half a mark for his "Memory-notes"

The ditches were well drawn, well cleaned out, and sufficient in number, as were the bridges, where they were needed.

Stock: 2 work-horses; 1 bull, 12 cows, 2 fattening beasts, 6 young beasts and 6 yearlings; 1 ram, 13 ewes, and 10 lambs.

Crops: 5 arpents of wheat, 40 of oats, 2 of pease, 6 of buckwheat, 20 of gabourago, 2 of seed-timothy, $\frac{1}{2}$ of turnips, $\frac{1}{2}$ of potatoes, 60 in meadow, 50 in pasture, $\frac{1}{2}$ in green-meet, a garden of 50 x 75 feet, and 3 hives of bees.

As M. Lupien receives 79 55 marks, he is entitled to a bronze medal and a diploma of Great Merit.

No. 32.—M. PAUL ROSSIGNOL.

We, on the 24th August visited the farm of M. Paul Rossignol, at St. Denis, Kamouraska, containing 162 arpents, 145 of which are under the plough, 10 are non-arable, 5 in bush $\frac{1}{2}$ in orchard, with a garden of 90 x 90 feet. Soil, partly clay, partly bog-earth.

Rotation: First year, after meadow, wheat, oats, barley with seeds; after pasture, oats, wheat, pease. Second year, after wheat he sows barley, oats with seeds, where barley or pease grew, he sows wheat. Hay for 3 to 6 years, and the land he pastures he generally leaves down two years and then sows grain two years running. This system of 2 years sowing he only follows on the light land, because this land requires it on account of its lightness. He only manures it with the ditch-stuff from the heavy land which he puts on the middle of the ridges, which are 30 yards wide, well rounded, and separated from each by a ditch made a-slope (*en talus*). He ploughs the dung in on the heavy land, generally for the barley-crop.

Division and fences, good. The house is good but not well arranged.

Barn, stable, cowhouse, sheepshed, and piggery are fairly adapted to the needs of the farm.

Implements almost sufficient in number, and well taken care of.

The manure is not well cared for, not under shelter; one mark taken off for the item of increase.

General management, good.

No accounts kept

As to permanent improvements, M. Rossignol has carted off 2,500 loads of stones; levelled land; straightened a water-course; made 4 arpents of drains that work very well; planted fruit-trees, &c.

Stock: 2 brood-mares, 1 workhorse, one yearling colt: 1 bull, 15 cows, 1 fattening beast, 1 2-year-old beast, 3 calves; a ram, 15 ewes, 13 lambs.

Crops: 16 arpents of wheat, 3 of barley, 25 of oats, 1 of mixed pease and rye, $\frac{1}{16}$ of flax, $\frac{1}{2}$ of potatoes, 30 in meadow, 70 in pasture, $\frac{1}{2}$ in orchard, and a garden 90 x 80 feet.

M. Rossignol receives 79.50 marks, entitling him to a bronze medal and a diploma of Great Merit.

No. 33 M. THÉOPHILE CÔTÉ.

September 1st saw us at M. Théophile Côté's farm, at Trois-Pistoles, Témiscouata; it contains 168 arpents, 112 arable, 14 non-arable, 42 in bush, with a garden 50 x 60 feet. The soil is partly sandy, partly clay, partly bog-earth.

Rotation: First year, wheat, barley, oats with grass-seeds, with interred dung on $\frac{1}{2}$ of the land, the other not getting dung till later. Hay for 4 or 5 years, pasture for 2 or 3. Where the land is sandy, he plants potatoes for one year, and the next he sows pease or wheat, followed by goudriole of oats and pease, and begins over again with potatoes. "I have only enough manure for my potatoes and my sandy land. I manure 7 arpents annually." This system is pretty good, but we took off one mark, because M. Côté ploughs more land than he can thoroughly manure.

The division of the farm is not perfect, so we had to deduct one mark on this account.

The fences are in good order; the fields almost free from weeds, but we were obliged to deduct a quarter-mark from the three allowed for this item.

The house is good, healthy and well suited for family occupation.

All the buildings necessary to the exploitation are good, convenient, and in perfect order.

The implements are well cared for, but there are not enough of them.

Manure well kept and increased in quantity.

Incomplete book-keeping, so M. Côté only got one mark for some detached notes.

The permanent improvements are being energetically carried on; the levelling, the cartage and mixing of sand and bog-earth, &c., &c., are very satisfactory.

Stock: 2 brood-mares, 1 3-yr.-old colt, one yearling; a half-bred Canadian bull, 13 cows, some of which are pure Canadian, 4 2-yr.-old beasts, and 3 fine calves: 13 ewes, and 15 lambs.

Crops: 8 arpents of wheat, $2\frac{1}{2}$ of barley, 2 of pease, 6 of mixed oats, pease and rye, $\frac{1}{2}$ of flax, 2 of potatoes, 18 in meadow, 80 in pasture, and a garden 50 x 60 feet.

M. Côté is awarded 79.20 marks, which entitles him to a bronze-medal and a diploma of Great Merit.

No. 34.—M. ELZÉAR HAMEL.

The farm of M. Elzéar Hamel, of Bécancour, Nicolet, contains 150 arpents arable, 30 in bush, and a garden of 50 x 40 feet. The soil is heavy, rich land. We were there on the 14th of July.

Rotation: First year, he ploughs the stubble (*friche*) in the fall, sowing oats, barley, pease and buckwheat in

the spring. Second year, after the oats, &c., &c. with seeds.

The hay stands 4 years, and the pasture 2 years. He carts the dung on just as he is ploughing, and sometimes in August and ploughs it in in the fall. He only manures part of the land he ploughs because he has not enough manure to go round; so we take off one mark for this.

The division of the land is not perfect, wherefore we only allowed him 1 mark out of 2 for this item.

The fences are of wood, and very good.

The fields are in good cultivation, except that there are a few ox-eyed daisies, so we allotted him only 2 marks out of 3 allowed for clean farming.

M. Hamel, as an experiment on a pasture last autumn, 1891, sowed broadcast 20 bags of salt, 3 weeks before ploughing. Last spring he sowed it in oats; we examined this field and found the crop very fine, and there was not one daisy in it. M. Hamel told us that he was so well pleased with the result, that he intended to get 50 bags to put on another neighbouring pasture next fall. It is on account of this experiment and of the efforts M. Hamel has made to destroy the daisies, that we gave him the 2 marks for the destroying of weeds, though there were still a great deal too many. We hope his experiment will be useful to the public.

Nothing can be better than the house in every respect.

Barns, stables, cowhouse, piggery, wood- and cart-lodge, are all very handy, and well suited to the wants of the farm.

Implements very good and in excellent order.

Manure not so well managed, so we took off a mark from this item.

Good general management all over. Accounts leave much to be desired.

Ditches are well cleaned out and plenty of them.

Stock: 2 fine brood-mares, and a 3-yr.-old colt; 2 bulls, 5 cows, 1 fattening beast, 3 yearlings, and 2 calves.

Crops: 12 arpents of wheat, 80 of oats, 2 of buckwheat, $\frac{1}{2}$ of seed-timothy, $\frac{1}{2}$ of potatoes, 35 in meadow, 55 in pasture, and a garden of 100 x 100 feet.

As M. Hamel as obtained 79 00 points, he has a right to a bronze-medal and a diploma of Great Merit.

No. 35.—M. ALFRED PICHÉ.

The 13th July found us at the farm of M. Alfred Piché of Ste. Gertrude, Nicolet.

It contains 321 arpents: 243 under the plough, 78 non arable, with a garden 30 x 30 feet, the soil being partly heavy land, partly sandy.

Rotation: First year, oats with seeds, hoed-crops on the sandy land; pease, goudriole on the heavy land. Second year, after the goudriole, oats with interred dung; after pease, wheat unmanured with seeds, 2 gals. of mixed timothy and clover to the arpent. Three years mowing and 2 years pasture. A farmer should never plough more land than he can manure in the course of the rotation, and for this fault, we deduct one mark from the four allowed for this item. We also deduct one mark for the imperfect division of the fields. The fences are fairly good.

Some ox-eyed daisies caused us to take off $\frac{1}{2}$ of a mark for this item.

The house is good and well suited to the needs of the family: the barns, stable, cowhouse, sheepshed, piggery, granary, cart-lodge, are old and built after the ancient system.

M. A. GAGNON'S BARN AND COWHOUSE, SAINT-FABIEN, RIMOUSKI.

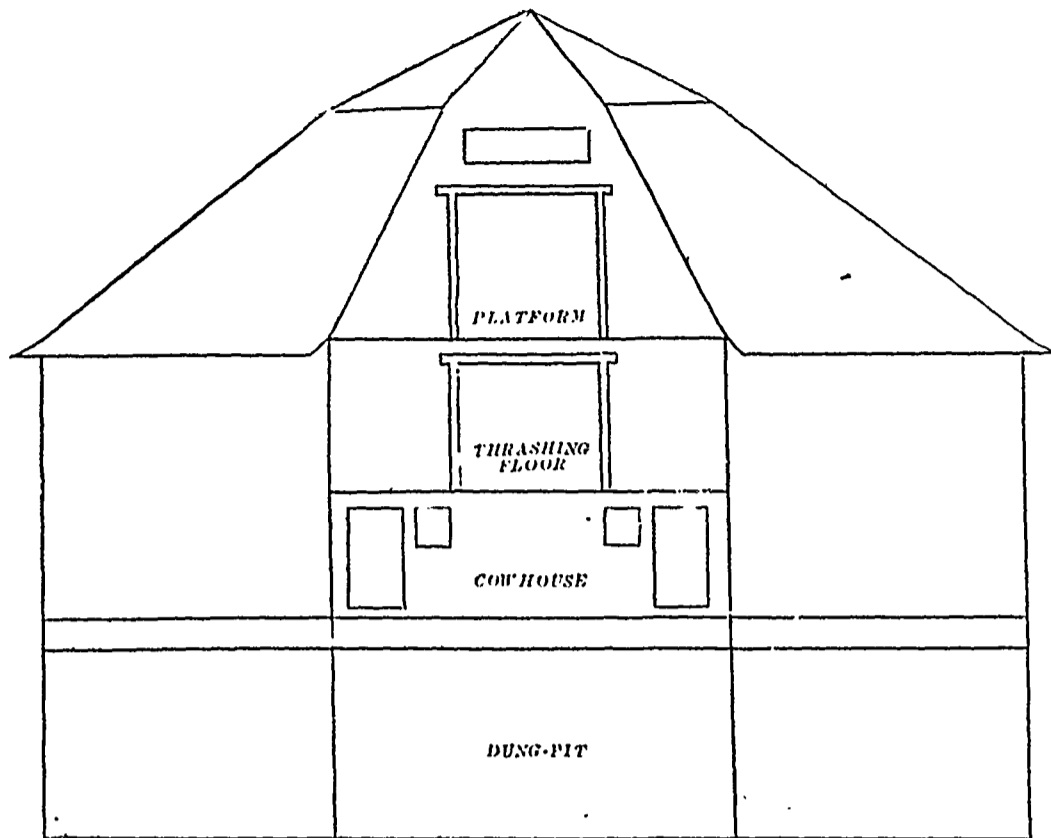


FIG. 1—FRONT EXTERIOR VIEW.

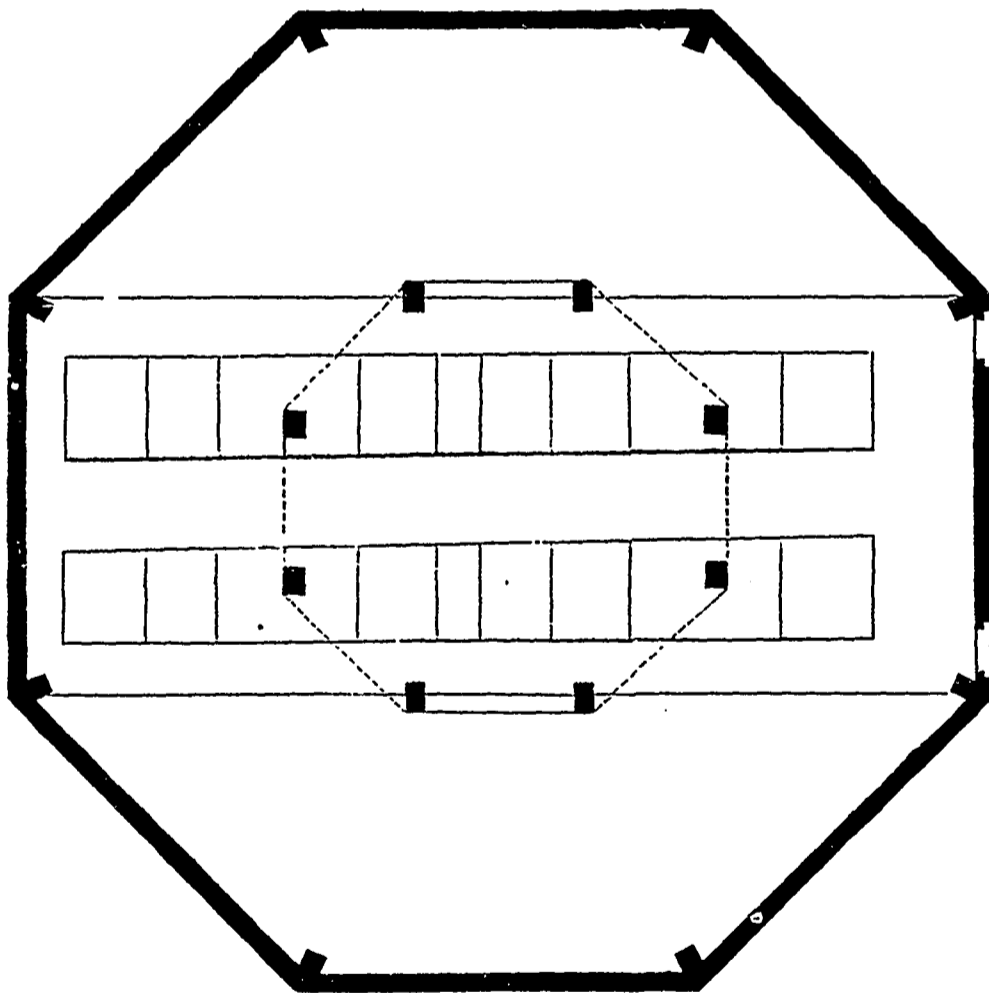


FIG. 2—PLAN, COWHOUSE STOREY.

it fertile. We remarked that in the spots where M. Talbot had put dung, lime, ashes, 2 tons of phosphate, on barley, potatoes, turnips, corn, and green-fodder-crops, everything looked well and promised good yields.

As the fields were too large, and a communicating road was wanting, we were obliged to deduct one mark from this item.

The fences were in perfect order.

We took off one point from the item of freedom from weeds on account of the ox-eyed daisies in the fields. The buildings are excellent.

The house is so good in every way, that nothing can be better. The barn, stable, cowhouse, wood- and cart-lodge, harness-room, are all very convenient, and suited to the needs of the farm. There are 2 splendid silos, and a very good ice-house well filled with snow.

The implements are very numerous, of very good sorts, and in capital order.

The dung is carefully preserved.

Good general management all over.

M. Talbot keeps no farm-books. His farm, when he got it, a very few years ago, was in very bad order; he had to make all the ditches, 5,800 feet of drains, to straighten 10 arpents of water-course, to plant forest- and fruit-trees. M. Talbot has spent on his farm, this year, besides the farm-manure, 50 barrels of lime and ashes, and two tons of superphosphate. The stock, which is very good, particularly the horses, consists of: a Hambletonian stallion, 3 brood-mares, 1 work horse, 1 3-yr-old half bred Hambletonian colt, 1 yearling, and one foal; 1 Jersey bull, 12 cows, 4 fattening beasts, 1 2-yr-old beast, and 7 calves.

Crops: 3 arpents of wheat, 25 of oats, 1 of turnips, 3 of potatoes, 3 of silage corn, 50 in meadow, 100 in pasture, $\frac{1}{2}$ in green meat, and a garden of 180 feet square.

According to the number of marks awarded to M. Talbot, 78.00., he is entitled to a bronze-medal, and a diploma of Great Merit.

No. 37.—ALPHÉE DEVEAU.

On the 4th of August, we found ourselves inspecting the farm of M. Alphée Deveau, of Lambton, Beauce; there are, in all, 72 arpents, 60 of which are arable, 12 in a maple orchard, with a garden of 20 x 180 feet the soil is loam (*terre-grise*), with a porous sub-soil.

The rotation is perfect: First year, after meadow, wheat, oats, with ploughed in manure and seeds where the wheat goes; after pasture, oats, barley, pease, with interred dung and seeds. Second year, where the wheat was with manure and seeds, he sows barley with seeds and manure; where there was oats without manure, he sows buckwheat, gabourage with ploughed in dung and seeds. He mows for 3 or 4 years, that is, as long as the hay is yielding well, and pastures 4 or 5 years. He sows grass-seeds every year to enrich his land, and to increase the value of the fodder.

The division is good, but we took off half a mark, because the field-road did not reach to the furthest field.

The fences are in good order.

No weeds in the meadows and pastures.

The house is good in all respects.

Barn, stable, cowhouse, piggery, wood- and cart-lodge, harness-room, work-shop, are all very convenient, and well suited to the requirements of the farm. We observed an inclined wheel, 18 feet in diameter, that works a thrashing machine, a winnowing machine, and a cross-cut saw with which M. Deveau cuts his firewood.

Implements are good, and in good order.

Preservation and increase of manure perfect: maximum marks allowed.

General management faulty as concerning fences and fields.

No farm-accounts kept by M. Picher; he only had some detached MS. for which we gave him one mark.

He received $7\frac{1}{2}$ marks, i. e. one-half of those possible, for his permanent improvements.

Stock: 2 brood-mares, 2 work-horses; 1 Ayrshire bull, 14 cows, 20 fattening beasts, 9 calves; 1 ram, 12 ewes, 8 lambs.

Crops: 8 arpents of wheat, 2 of barley, 10 of oats, 7 of pease, 30 of gabourage, $4\frac{1}{2}$ of potatoes, $\frac{1}{2}$ of maize to ripen, $1\frac{1}{2}$ of silage-maize, 120 in meadow, 50 in pasture, and a garden 30 x 30 feet.

M. Picher's marks amounted to 78.20, entitling him to a bronze-medal and a diploma of Great Merit.

No. 36.—M. ONÉSIPHORE TALBOT.

On the 26th we inspected the farm of M. Onésiphore Talbot, of St. Michel, Bellechasse, containing 190 arpents, i. e., 175 arable, five unploughable

10 in bush, 1 in orchard, and a garden of 150 feet square. The soil is mostly sandy, only a very small part being heavy land.

Rotation: first year, oats with seeds, hoed-crop, with interred dung. Second, after the hoed crop, barley and seeds, left in meadow for two years, in pasture for two years. He manures 7 arpents yearly. We do not approve of M. Talbot's rotation, so he only got 2 marks.

The best system of rotation is never to plough more land than can be thoroughly manured; a sandy soil, like this, wants frequent manuring to keep

magnificent harness, two sheds for the hay, all made by himself.

The implements are numerous enough, of good kind, and in good order.

Manure kept with care.

General management excellent.

No accounts kept.

Permanent improvements satisfactory, as the number of marks allowed testify. M. Deveau has used on his farm, this year, in addition to the farmyard manure, 250 loads of dung and of tannery refuse, mixed with bog-earth.

The stock is good but not numerous: a brood-mare, a workhorse, 1 2-yr.-old, 1 yearling; 4 mitch-cows, 2 2-yr.-olds, and 2 yearlings.

Crops: $1\frac{1}{2}$ arpents of wheat, 9 of oats, 1 of buckwheat, $\frac{1}{2}$ of potatoes, 20 in meadow, 28 in pasture and a garden 20 x 180 feet.

M. Deveau receives 77.85 marks, which entitles him to a bronze-medal and a diploma of Great Merit.

No. 38.—M. PIERRE GODBOUT.

The 5th August saw us at the farm of M. Pierre Godbout, of St. Vital de Lambton, Beauce, containing 120 arpents, 50 of which are arable, 25 in permanent pasture, 40 in bush. $\frac{1}{2}$ in orchard, with a garden of 100 feet square. The soil is loam, with a porous subsoil.

Rotation: First year, wheat, oats, pease and hoed crops. Second year, oats after wheat, pease after oats, wheat after pease with seeds and dung in the furrow, on half the land before harrowing. He leaves the meadow down 3 to 4 years, pasturing afterwards 2 or 3.

The part not manured, is top-dressed after the hay is carried. For this, we deduct one point, because he uses half his dung as top-dressing, and thereby incurs a loss of fertilising matters.

The division of the farm is fair, but, as there is no road, we deduct half a point.

Fences good, and there are no weeds.

The house suits itself to the requirements of the family.

Barn, stable, cowhouse, sheepshed and piggery, are all in good order.

Implements, almost sufficient in number, good as to their kinds, and well cared for.

The manure is never under shelter, so for that we deduct one point.

General management, good everywhere.

For accounts, as M. Godbout has only "Memory-notes," we can allow him but half a mark.

Fifteen marks, the maximum, are awarded to M. Godbout for permanent improvements.

The stock is very fine: 1 brood-mare, 2 work-horses, 1 2-year-old colt; 1 bull, 10 cows, 2 calves, 7 ewes, and 11 lambs.

The harvest of the year was very good: 2 arpents of wheat, 6 of oats, $\frac{1}{2}$ of pease, 4 of goudriole, 1 of seed-timothy, $\frac{1}{2}$ of potatoes, 36 in meadow, 30 in pasture, $1\frac{1}{2}$ in green-fodder, and a garden 100 feet square.

The points, 77.55, awarded to M. Godbout entitle him to a bronze medal and a diploma of Great Merit.

No. 30.—NÉRÉE RICHARD.

We arrived at the farm of M. Nérée Richard, of Ste. Gertrude, Nicolet, on the 12th July, 1892. The farm contains 152 arpents 119 of which are arable, one in orchard, with a garden 50 x 100 feet. The soil is a strong clay loam. M. Richard is the son of a farmer. At the age of 28, his

father gave him the farm he now occupies, on condition of his paying \$50.00; the land was then in standing wood, and was valued at \$100.00. He went to the *shanties* in the winter, to earn funds to help him to begin his farm; in summer he worked for his father, and when he had a little time to himself, he worked on his own farm.

At 22 years of age, he married and went to live on his farm, in a house he had built himself. He brought up 17 children, many of whom are dead after growing to some age, and ten are alive. He educated 5 girls, 2 of whom are nuns, 3 have diplomas, one for model-schools, two for elementary schools; the boys have all been to school, and one has gone through his commercial course at college. He has no debts, on the contrary he has \$420.00 lent out at interest. With the land in bush he has bought, he values his property at \$6,000.

His rotation is fair, but we dock him of one mark because he does not manure all the land he ploughs, and the soil, although rich, will end by being exhausted if he does not manure sufficiently.

Rotation: First year, oats, goudriole with seeds, wheat and potatoes. Second, oats after wheat, barley after potatoes with seeds. He mows 2 to 3 years and pastures 2. He does not manure all the land he sows; he carries the dung in winter to the fields and puts it into great heaps.

The division of the farm and the fences are good.

The house suits the family.

All the buildings of the farmstead are old-fashioned and not very convenient; still they are sufficient for the stock, and kept in perfect order.

There are not enough implements. The manure is not sheltered in summer, but exposed to the sun, so we have deducted a mark for this fault.

General management, good all over.

M. Richard, not being educated, has never learnt how to keep farm accounts; he could only give us "Memory-notes," for which we gave him $\frac{1}{2}$ a mark.

As to permanent improvements, M. Richard has had very few to make, except ditches, which are plenty in number and well cleaned out.

Stock: 3 work-horses; 1 bull crossed Ayrshire and Canadian, 12 cows, 4 calves; a ram, 5 ewes, and 2 lambs.

Crops: $2\frac{1}{2}$ arpents of wheat, 1 of barley, 17 of oats, $3\frac{1}{2}$ of pease, 6 of gabourage, 3 of seed timothy, $\frac{1}{2}$ of flax, $1\frac{1}{2}$ of potatoes, 4 of corn to ripen, 30 in meadow, 30 in pasture, $\frac{1}{2}$ in green-fodder-crop, a garden 50 x 100 feet, and three hives of bees.

M. Richard having deserved 77.50 marks, receives a bronze medal and a diploma of Great Merit.

No. 40.—M. AUGUSTE FAFARD.

On the 19th of August last, we visited the farm of M. Auguste Fafard, of the parish and county of Hllet. It contains 180 arpents, of which 13 are arable, 10 unploughable, 2 in bush, $\frac{1}{2}$ in orchard, and a garden 100 x 50 feet. The soil is clay in parts with a mixture of bog-earth occasionally, in other parts sandy.

Rotation: First year, after meadow, wheat, oats, with seeds, 2 gals. of timothy and 2 lbs. of clover to the arpent, after pasture, wheat, oats, gabourage with seeds. He mows 5 to 12 years, and pastures 2 to 4 years; 5 or 6 arpents are manured yearly;

half the manure is used as top dressing on the first year's grass, and the rest is ploughed in with potatoes. We do not approve of this rotation, and only gave him two marks for this item. We advise M. Fafard not to plough more land than he can manure during the course of the rotation.

A few weeds are to be seen in the fields.

The buildings are excellent, barn, stable, cow-house, sheep-shed, piggery, and sheds, are all perfectly suited to the wants of the farm. The improvements are fairly complete, but as there are but a few wanting we have only deducted half a mark for this item.

The system of management is perfect except as to the fences and fields. M. Fafard keeps no farm-accounts.

As to permanent improvements, M. Fafard has built fences with 15,000 loads of stones from the land. He has carted off the ditch sides to fill up the holes left by stones extracted; for these items we gave him $1\frac{1}{2}$ marks out of 15.

The stock, which is very fine, consists of: 1 brood mare, 2 work-horses, 1 3-year-old colt; 2 half-bred Ayrshire bulls, 9 cows, 2 fattening beasts, 5 2-year-old beasts, 5 yearlings, and 5 calves; a ram and 11 lambs.

Crops: 6 arpents of wheat, 31 of oats, 6 of potatoes, 52 in meadow, 83 in pasture, $\frac{1}{2}$ in orchard, with a garden 100 x 30 feet.

We gave M. Fafard 7.10 marks, which gives him a right to a bronze medal and a diploma of Great Merit.

No. 41.—M. J. ELVIE JALBERT.

July 27th., we visited the farm of M. Joseph Elvie Jalbert, St. Ignace, Montmagny; it contains 157 arpents of which, 101 are arable, 6 in pasture that cannot be ploughed, 42 in bush, 1 in orchard, with a garden 180 feet square. The soil is partly heavy land, partly sandy, and partly bog-earth. Besides this farm he has a splendid marsh, that yields him forty loads of hay for his stock.

Without being perfect, his rotation is pretty good; we deducted one mark because he sows oats on his bog-earth without manure. We would advise him to follow the system of M. Langlois, of Rivière Ouelle, and particularly the system of M. Rossignol, of St. Denis (see 4th and 3rd report).

M. Jalbert's rotation: bar ey, oats, grass-seeds with interred manure on part. Second year, hoed-crop after the barley. Third year, after the hoed crop, barley or oats with seeds. He mows 5 to 6 years, and pastures 2 to 3 years.

Division of the farm and fences, good.

Crops looked well when we saw them, and there were no weeds.

The house is convenient.

Barn, stable, cowhouse, cart-lodge, piggery, and silo, are well suited to the farm.

Implements, very good, but insufficient in number.

Preservation and increase of dung, good.

General order, good.

No books kept by M. Jalbert.

As to permanent improvements, M. Jalbert has carted off 400 loads of stones, he has levelled the hollows of his farm by carting to them 3,000 loads of ditch sides, and carried bog-earth on to his sandy land.

Stock: 2 brood mares, 1 2-year-old colt; 1 bull, 11 cows, 6 2-year-old fattening beasts.

Crops: 6 arpents of barley, 36 of oats, $\frac{1}{2}$ of cabbages, 2 of potatoes, 1 of silage-corn, 47 in meadow, 62 in pas-

ture, 1 in orchard, and an excellent garden of 180 feet square.

M. Jalbert gets 77.00 marks, and therefore wins a bronze medal and a diploma of Great Merit.

Household.

PLUM-PUDDING.

The Christmas season is now drawing so near that it behoves those housewives who believe in the good old rule of taking time by the forelock to set about preparing their plum-puddings, mincemeat, and rich Christmas cakes without further delay, as all these dainties are decidedly improved by keeping, time being required to draw out the full rich flavour of the various ingredients. I am going, therefore, to furnish this week some excellent recipes for the making of plum puddings and mincemeat, and I know that they will give every satisfaction, as I have followed them myself for several years now, and am able, in consequence, to speak from experience—that best of all teachers. In my own household we have found it a capital plan to set apart one day during the first week in December for the performance of this special, red-letter sort of work, and we have, so far, always felt that the hours thus spent were rightly numbered amongst the happiest of all the year, because we all—servants and children all included—entered into the business willingly and heartily, thus making it really more of a treat than a task; and as "many hands make light work," it was satisfactorily completed before anyone had time to become tired and weary of it.

A RICH PLUM PUDDING.—In this recipe I will just give the proportions for a large family pudding, one to serve from twelve to fourteen persons, but the various ingredients can very easily be increased or diminished, according to individual taste or convenience, so long as the method of preparation is carefully observed. I generally use about three times the given quantities, and then divide the mixture into several puddings of different sizes, according to what I think I am likely to require, but this, of course, is quite optional. The items necessary for the large family pudding already mentioned are as follow:— $\frac{1}{2}$ lb. of roughly-chopped kidney beef suet, 10 oz. of sifted bread-crumbs, 1 lb. each of raisins carefully stoned and chopped, and currants well picked and cleaned, $\frac{1}{2}$ lb. of finely shred or chopped candied peel, a good teaspoonful of salt, four tablespoonfuls of moist sugar, a seasoning to taste of mixed spice, $\frac{1}{2}$ lb. of finely-sifted flour, a wineglassful of good brandy, and six, eight, or even ten fresh, well-beaten eggs, according to size. Put all the dry ingredients into a bowl, and mix them thoroughly; then moisten them with the eggs and the brandy, and turn the preparation into a buttered mould, which it will fill to within about an inch; cover the top with buttered paper first then with a good strong pudding cloth and plunge the pudding into plenty of fast boiling water, where it must remain boiling steadily for six or seven hours, more boiling water being added when necessary. See that the mixture is not made at all "sloppy," or the result will not be nearly so pleasing, and have the pudding-cloth sufficiently large to gather up at the corners and tie in a firm knot, then, when done enough, drain carefully, and hang up by the knot in a suitable place until

MDE. A. GAGNON'S BARN AND COWHOUSE, SAINT-FABIEN, RIMOUSKI.

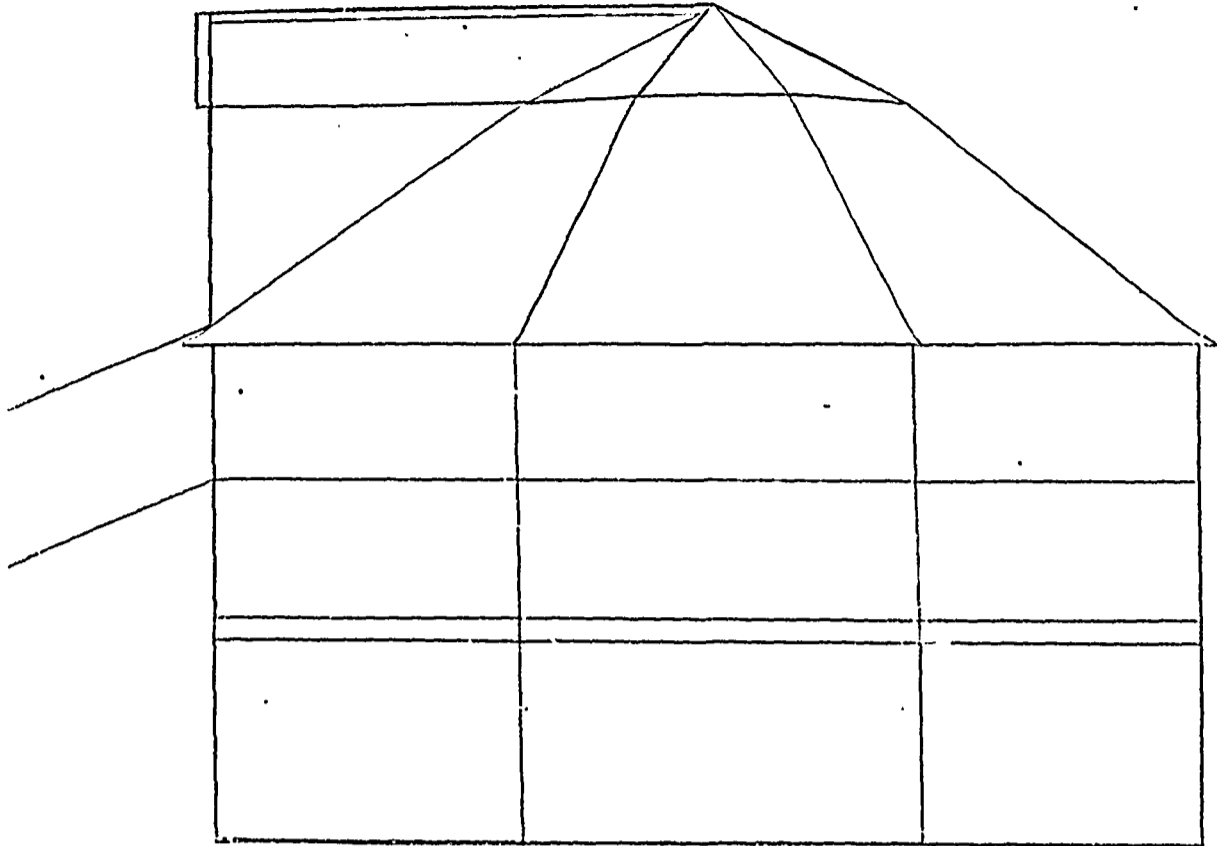


FIG. 3—SIDE EXTERIOR VIEW.

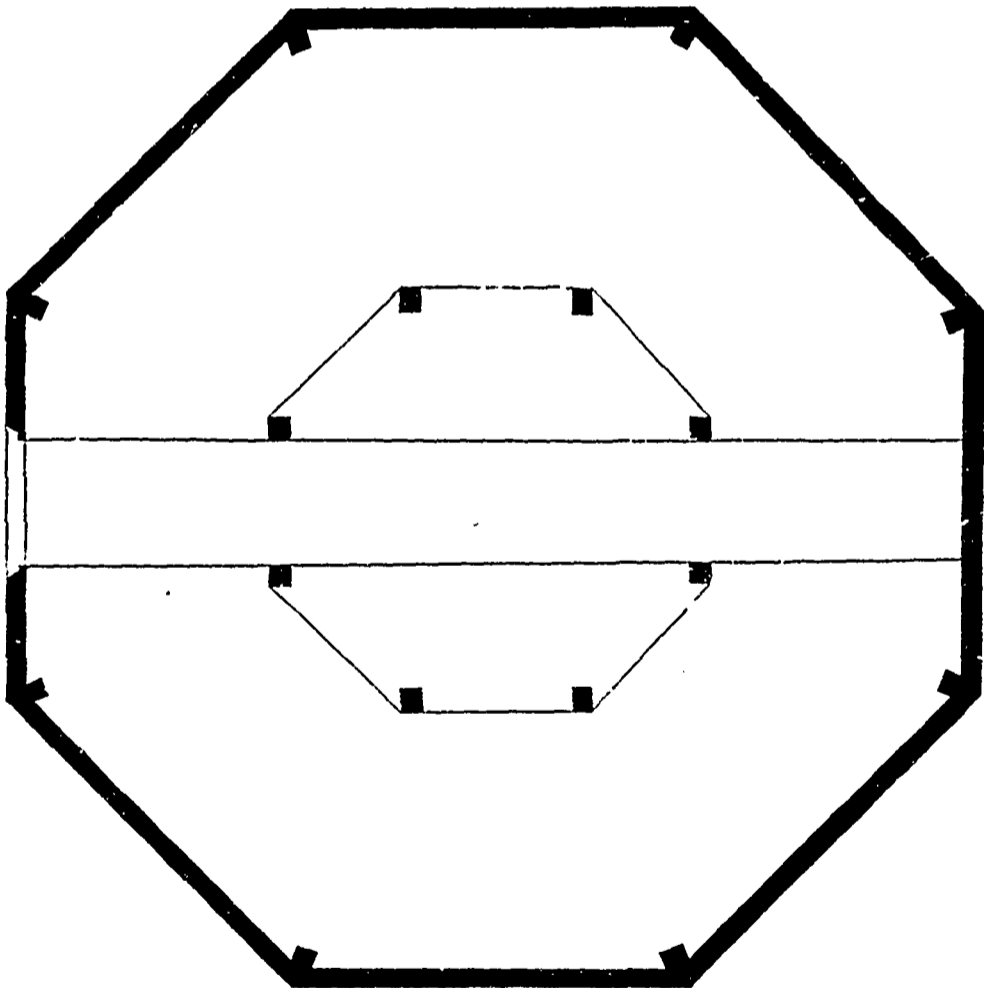


FIG. 4—PLAN, LEVEL OF TOP STOREY.

required. Before serving, boil the pudding for at least two hours; then remove the cloth and the paper, and turn out on to a very hot dish; stick a tiny bit of holly, well covered with berries, in the centre, and dust with white sugar thickly over the top to give it the appearance of freshly fallen snow. This is an exceedingly pretty style of serving, only the sugar must not be sprinkled until the last moment, or it will dissolve, and thus entirely spoil the nice effect of the dish.

THE SAUCE.—A plum-pudding

without sauce would be quite as unusual as beef without mustard, in the opinion of most people; therefore, a good sauce must accompany the above delicious pudding to table, and to make this proceed as follows:—Put two large tablespoonfuls of flour into a basin with half a teaspoonful of salt, and mix to a smooth paste with a little cold water; then, when every tiny knot has been bruised out, put it into an enamelled saucepan with 1 pint of milk and 2 oz. of fresh butter, and stir constantly, and always in one

direction, until the sauce boils and becomes of a perfectly smooth, creamy consistency; then draw the pan a little on one side where there is no fear of the contents boiling, and stir in the yolks of two fresh eggs and a glass of brandy; continue stirring for a few minutes longer, then strain into a hot tureen, sweeten to taste, and serve; or, if preferred, omit the brandy, as in either case the sauce will be most delightful.

MINCEMEAT.—This is my own special recipe, and I have never found

another to surpass it, so that I can recommend it with every confidence. Have ready the following ingredients:—2 lbs. each of beef suet, apples, and currants; 1 lb. each of raisins and moist sugar; ½ lb. of candied peel, ½ oz. of mixed spice, the grated rind of two, and the strained juice of four, large fresh lemons, and from a quart to half-a-pint of really good brandy. Chop the suet until it is as fine as oatmeal, peel, core, and chop the apples, carefully clean the currants, stone and chop the raisins, and cut the peel into tiny dice; then put all these into a bowl, mix them thoroughly with a wooden spoon, add the other ingredients, and stir until the whole is well blended, after which press the mincemeat into properly-prepared, stone or glass jars; cover with rounds of thick white paper but so as to lie flat on the mincemeat, and then soaked in brandy; and, last of all, render each jar airtight by tying it down with bladder, or paper, several plies thick; store in a cool dry place, and use when required, only remember that if kept for two or three weeks the mincemeat will be decidedly richer and better flavoured. When the pies are wanted, make some paste according to the directions given a fortnight ago in recipes for "Small Pastry," and after rolling this out very thin, use it to line out some small patty tins, which have been buttered in readiness; half fill these with the mincemeat, cover with lids of the pastry, then moisten the edges, press them gently together, make a wee hole in the centre, brush over the surface with beaten egg, and bake in a well heated oven. Serve very hot, neatly arranged on a hot dish paper, the tops lightly sprinkled with fine white sugar, and the edge of the dish tastefully garnished with a border of fresh holly leaves.

NOTE.—Perhaps some of my readers, whose digestive organs are not quite so strong as they might be, will take little or no interest in the above subject, as they have doubtless come to the conclusion that dainties such as these are not on any account to be indulged in by them—the mere mention of them indeed being sufficiently powerful to conjure up all the manifold horrors connected with indigestion, nightmare, dyspepsia, &c.—but may I say that, after a very long and practical experience, I am perfectly convinced that neither of these dainties need be so much dreaded, because if properly cooked and eaten with discretion they will never prove hurtful to an even ordinarily healthy stomach; only, of course, it must not be forgotten that in these few words lies the whole secret.

MARIE.

(ENG. AG. GAZETTE.)

COLD DISHES FROM CALF'S HEAD.

A GALANTINE.—Take a perfectly fresh calf's head—or half of one, according to the size of the dish required—and after thoroughly cleansing and blanching it as described in my former paper, wash it again, and boil it gently with the usual complement of flavouring vegetables until the bones can easily be removed; then take it up, bone it carefully, and lay it out flat on the table, skin downwards, and sprinkle it with alternate layers of minced parsley, prime lean ham, and the tongue, cut in thin slices, and hard-boiled eggs, just roughly chopped, each addition being pleasantly seasoned with salt, pepper, and pounded mace. Roll up the meat as neatly and firmly as possible, bind it round and round with narrow tape in order to preserve it in shape,

then wrap it in a cloth, and boil it again, very gently, until thoroughly cooked, but not overdone. If half a head is being used, allow about an hour and a-half for the first boiling, and two hours and a-half for the second, or perhaps a little longer, according to the size of the galantine; then, when done enough, take it up, drain it well, and put it to press between two dishes with a heavy weight on the top but do not remove the cloth or the binding until next day. After these have been taken off, brush the surface of the galantine over with liquid glaze—made by boiling down a little of the liquor in which the head was cooked—then sprinkle it with fine brown raspings, ornament it with tiny patches of sifted egg yolk, and place it on its dish; garnish round about with sprigs of parsley and slices of fresh lemon, and serve. This forms a most delightful luncheon or supper dish, and well repays any little extra trouble involved in its preparation, as it is so very dainty, both in appearance and taste; it is an exceedingly economical dish, too, as a very small portion of it goes a long way.

CALF'S HEAD BRAWN.—Put into a saucepan 1 lb. of salt, a $\frac{1}{4}$ lb. of bay salt, $\frac{1}{2}$ lb. of moist sugar, 1 oz. of saltpetre, and 3 quarts of water, and boil together for twenty minutes, then strain the liquid into an earthenware vessel, and skim carefully when cold. Lay into this pickle half of a large fresh calf's head, which has been well cleansed and blanched, and from which the brains and soft bones have been removed, and let it remain there for about a week, turning it once every day; then take it out, wash it well, and boil it very gently until tender, after which bone it carefully, cut the meat into dice, and the tongue into small thin slices, and season both according to taste with salt, if necessary, pepper, and pounded mace. Mix the meat nicely and, while still hot, arrange it in a brawn-tin; then set a heavy weight on the top and leave it in a cool place until quite cold and firm. Serve turned out on to a dish-paper, with a tasteful garnishing of fresh parsley round about.

CALF'S HEAD CHEESE.—Take the remains of a cold calf's head that has been either boiled or baked, and after freeing the meat from bones and skin, cut it up into small neat dice, and mix it with one-third its weight of prime bacon or ham, previously cooked and cut up in the same way; season the meat pleasantly with salt, cayenne, mace, and lemon juice and put it into a stewpan with sufficient of the liquor in which the head was cooked to just barely cover it and simmer as gently as possible for fifteen or twenty minutes; then turn the preparation into a damp mould, and leave it until next day, when it must be carefully turned out, prettily garnished, and served. When the "cheese" has become so small that it is not very presentable in its original form, it will, if cut neatly and very thin, make most delicious sandwiches, and these, when tastefully arranged on a pretty dish paper, and garnished with tiny sprigs of fresh parsley, form a most appetising and very highly appreciated dish, suitable for luncheon or supper.

MARIE.

Bread baking.

How can you know when the oven is hot enough? The exact way is to test the heat by a thermometer. The oven should register 450 degrees Fahrenheit. This seems to be a great heat, but it makes the crust to support the

acid gas ceases. This happens soon after the yeast plants are killed by the heat. It is curious to know that the inside of a loaf is only 212 degrees. The moisture in the dough keeps down the temperature and prevents the scorching of the crust unless the fire gets too hot. Few thermometers register such a great heat, so we must try some other plan. The baker throws a little flour into his oven. If it blackens without taking fire, the oven is just right; if the flour blazes, the heat is too great, and if the flour scorches a little, the oven is too cool.

Yet another way is to stick your hand into the oven. If you can bear it there while you count twenty-five, your oven is hot enough. This is for wheat bread, and medium-sized loaves. For large loaves and all kinds of brown bread you must count thirty, as the oven should be cooler. Most ovens are uneven, so you must watch the ways of your own oven and turn your loaves often till you have found out what to expect.

Some ovens bake quicker on one side than another, and if you are not watchful a heavy crust will form on one side or corner, and the soft dough will swell out on the other side, making an ill-shaped loaf. Elevated ovens are apt to burn on the bottom, while those behind or under the fire-box burn on the top. When the crust is forming too quickly, a sheet of brown paper laid over the top of the loaf will check that, and an old tin or piece of iron placed under the loaves will prevent the burning on the bottom. Do not use newspaper; printer's ink in such heat forms a smoke that would make your eyes smart painfully. Try to have a steady fire, and fix it so as not to have to add fresh coal or too much wood during the baking as this will lessen the heat about the ovens.

One hour is the usual time for baking ordinary loaves, but no one can tell exactly, save the cook who has the fire and oven in charge. So bring to your baking quick wits and get your giant (sic) and his partner well in hand. Brushing the top of the loaves with cold water before they are put in to the oven makes a nice crust, as it keeps the dough from overbaking.

Be sure you grease your pans well, and if the bubbles in the dough are large, take it out of the pans and knead it once more. It is too light, and will be coarse in texture. When the bread is baked, it will have a good brown crust on the bottom and will "click" loudly when you put your ear close to the loaf. Listen well. If you do not hear the "click" distinctly, put the bread back in the oven at once. When baked, tip it out of the pans, stand the loaves up edgewise, and cover them with a clean cloth. A cloth wrung out in cold water put under the dry one will soften the crust if it is overbaked.

Youth's Companion.

Dainty Methods of cooking and serving Tripe.

When perfectly fresh, well cooked, and tastefully served, prime beef tripe forms a most delightful dish, being at the same time a thoroughly wholesome, light, and nutritious article of diet. It can be dressed, too, in such a variety of dainty styles that it is quite possible to indulge in it frequently without any danger of its becoming monotonous, but, of course, everything depends upon the methods adopted in the cooking and serving, as tripe, like every other article of food, can easily, by careless, injudicious treatment, be rendered extremely disagreeable and unattractive. I want, therefore, to describe this week a few of the meth-

ods which, in my own household, have proved most pleasing and satisfactory, and I hope that my readers will be persuaded to try them, as I am sure they would heartily enjoy and appreciate the dishes.

Before giving the recipes, however, I should just like to call attention to the fact that, although the tripe is generally supposed to have been thoroughly cleaned before being offered for sale, it should always be carefully blanched previous to its being cooked, as by this means only can we guarantee the perfect purity and cleanliness of the article. To do this effectually, put the meat into a saucepan of cold, well salted water; bring to the boil, simmer for about five minutes, then drain, scrape if necessary, and dry by pressing it gently in a clean soft cloth, after which prepare it according to any of the following recipes, all of which are highly to be recommended:—

A FRICASSEE OF TRIPE.—Take two pounds of prime fresh tripe, blanch and dry it as already directed, then cut it up into small, neat squares, and lay them in a saucepan with sufficient milk and water in equal parts to entirely cover them; add a large onion cut in quarters, a bunch of herbs, and a good seasoning of salt and white pepper; then cover closely, and stew very gently until the tripe is quite tender, when it must be dished up in a pile in the centre of a ring or border formed of whole medium-sized potatoes, which have been carefully steamed or boiled in the usual way until quite dry and floury; then cover the whole with a rich, savoury white sauce, made as below, sprinkle the surface with a little finely chopped parsley, and serve as hot as possible. To make the sauce, put a pint of milk into an enamelled saucepan with a good seasoning of salt and white pepper, a teaspoonful of finely-minced, par-boiled onion, about an ounce of butter,

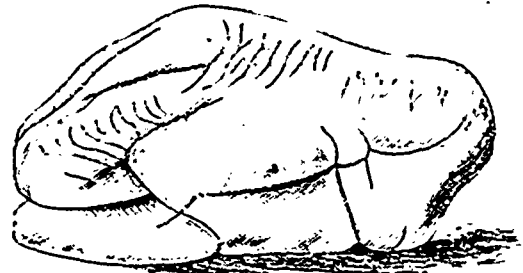
drain it well, and cut it up into small neat pieces; dry these thoroughly, egg and breadcrumb them in the usual way, being careful to press the covering in firmly, then fry in boiling clarified fat until richly browned on both sides, after which drain again, and dish up in a neat pile on a flat, nicely arranged bed of well-mashed and seasoned potatoes. Have ready at the same time some nicely-made brown onion sauce which has been prepared in the following manner:—Slice very thinly three or four medium-sized Spanish onions, and fry them in the same fat as the tripe was cooked in until well browned; then drain them thoroughly from the fat, and stir them into about a pint of thick, creamy, brown sauce; simmer gently until the onions are quite soft, then add a tablespoonful of made mustard, and a further seasoning of salt and pepper, if necessary, and the sauce is ready.

Ag. Gazette.

Preparing Poultry for the table.

We published in the *Field* of Feb. 11 an account of the mode of trussing fowls when required for roasting, as practised by the first-class poulterers of the West-end. The method adopted, when they are required for boiling is somewhat different, and is represented in the accompanying engraving.

We are again indebted to the very skilled operator at Messrs Bollamy's for a careful demonstration of the method pursued, which may be described as follows: The fowl, when taken in hand after having been plucked, is, in the first instance, treated as one required for roasting, as before described. The extreme tip of the wing and the thumb pinion are cut away, as well as the loose strip of skin along the underside of the wing, which is left after the removal of the quill feathers. For the proper mode of removing the



FOWL TRUSSING FOR BOILING.

and three large, fresh, well-beaten eggs, and stir constantly over a moderate fire until the sauce becomes of a smooth, thick, creamy consistency without ever reaching boiling point. Then add a pleasant flavouring of strained lemon-juice, and use as directed.

TRIPE FRITTERS.—After cleansing the requisite quantity of tripe in the manner described above, boil it gently until sufficiently tender, then drain and dry it, and cut it up into small pieces about $2\frac{1}{2}$ in. long by $1\frac{1}{2}$ in. wide; season these well with salt and pepper, dip separately into thick, rich, frying batter, and fry in plenty of boiling clarified fat until coloured a lovely golden-brown, when the fritters ought to be well swollen out and present a light, puffy-looking appearance, which renders them dainty in the extreme. Drain thoroughly on a piece of blotting or kitchen paper, pile up high on a neatly-folded napkin on a fancy dish paper, garnish tastefully with parsley, and serve very hot.

FRIED TRIPE WITH BROWN ONION SAUCE.—When the requisite quantity of tripe has been carefully blanched and dried, boil it until quite tender,

neck, crop, and merry-thought, and drawing the fowl, we must refer to our previous article, as, so far, there is not the slightest difference in trussing for boiling from that adopted for roasting, but the subsequent proceedings are very different.

The fowl having been drawn, the fingers are passed under the skin at the side of the breast, which is separated and loosened from the flesh round the lower joint of the leg, right down to the hock. This is done on both sides, and so effectually that by laying hold of the shank the fleshy part of the leg can readily be pushed under the skin, but before this is done, a cross cut is made at the back of the leg 1 in. above the hock, and another about $1\frac{1}{2}$ in. below the hock, but this is made in the front. These cuts are for the purpose of dividing the sinews and enabling the foot to be twisted right round so as to come at the back of the fowl. Then, holding the foot in the hand, the hock is pushed through the first cut made in the skin, which is drawn down over it, and it disappears altogether from view. The shank is then cut across where it projects beyond the skin, and the foot is in this way

removed, and, the hock being under the skin, no portion of the leg is visible. The fowl is then turned over, and it is customary to crack the shoulders by striking them between the wings and the spine with the back of the knife. This enables the wings to be brought closer to the body when the trussing is completed.

The long trussing needle, which is threaded with fine string, is then passed through the leg at the back of the knee from one side, and through the corresponding part of the leg on the other, and through the pinion and joint of each wing. This brings the string to the same side where the needle was first passed through the leg, and the two ends are tied lightly together, thus securing the legs and the wings firmly to the body with one tie, as is shown in the left hand side of the figure. In order to secure the ends of the legs which are thrust under the skin a second string is passed through the body above the hock (which must be felt for, as it cannot be seen), then under the breast-bone down to the hock on the opposite side, and brought round behind the back and securely tied. The tail is then, as it were, pushed into the interior of the body, and the fowl, ready for boiling, appears as is shown in the figure.

The description may appear, to include numerous details, but we can testify from experience that it is not difficult to follow the steps with a fowl in hand, and once learned it is not easily forgotten.—*The Field*.

The Dairy.

OFFICE OF THE DAIRY COMMISSIONER.

CENTRAL EXPERIMENTAL FARM.

DEPARTMENT OF AGRICULTURE.

OTTAWA, CANADA.

Notes for Cheese-Makers for May.

By Jas. W. Robertson, Dairy Commissioner.

FACTORIES AND THEIR SURROUNDINGS.

1. The present, not next week, will be the best time to see that all the drainage facilities of the factory are adequate and in good order.

2. Whey runs, spouts and tanks should be put into such order that leaking will be prevented.

3. If there be a leakage anywhere from floors, spouts or tanks, which is not immediately preventible, provision should be made at once for the drainage of the waste, if only by shallow open trenches. A liberal supply of lime and gypsum should be spread around such places. Don't fail to secure a barrel or two of each, *some time this month*, for use during the hot weather.

4. If the factory buildings are not painted and will not be painted, get them whitewashed this month. If you cannot get that done by the proprietors or managers, get permission and do the rest yourself. A whitewashed curing-room of imperfect construction, can be kept 10 degrees cooler in summer than one not whitewashed. If the cheese become injured, through excess of heat, neither the buyers nor the patrons will whitewash your reputation, whether the blame belongs to you or not.

5. Make and keep the surroundings of the factory neat and tidy.

6. While keeping the outside of the premises as creditable to your taste and neat habits as possible, make the inside to reflect still more your aversion to everything untidy and dirty. Give every part of the factory a thorough cleaning and keep it in a sweet state all summer.

7. Before the curing room contains any cheese, fumigate it by burning some sulphur mixed in alcohol. This will help to prevent the growth of mould on the outside of the cheese.

8. The leisure hours of May, before the large flow of milk is received, should be employed in putting all the apparatus, appliances, utensils, and machinery into the best of working order.

9. Be sure that the making room floor is so well constructed and supported that it will not shake or vibrate during the coagulation of the milk.

MILK AND MAKING.

1. Procure a copy of "Milk for Cheese Factories" for each of your patrons by applying to the Dairy Commissioner, Central Experimental Farm, Ottawa, stating the number required and the address to which they are to be sent. They will be furnished free in French or English.

2. Look out for "leaky" flavours in the milk. Don't put such milk into the vat with that of the other patrons. If you have time, make it up by itself, and send the cheese from it to the patron who supplied that milk for his private use.

3. Make provision for keeping a short record of each day's work, of the exceptional treatment of every vat, and of the comparative quality of the cheese made from every vat.

4. Milk sours readily and rapidly for a number of weeks after the period of lactation in the cows begins. Hence, milk seldom requires to be ripened for setting, during May.

5. Use enough rennet to coagulate the curd into a state fit for cutting, in from 12 to 25 minutes, at from 88° to 92° Fahr.

6. Cut it rather early, slowly and very carefully.

7. Use the horizontal knife first.

8. Afterwards allow the curd to settle until whey comes over nearly the whole surface.

9. Then begin to cut with the perpendicular knife.

10. Immediately after the cutting is completed, begin to stir the mass slowly and continuously until the curd is cooked.

11. Heat should not be applied until 10 minutes after the stirring is commenced.

12. The heating should be effected gradually, at the rate of about 1 degree for every 4 or 5 minutes until 97° or 98° Fahr. is reached.

13. Draw most of the whey early, and thus guard against being caught unprepared for the rapid development of acid.

14. Don't dip the curd until the presence of acid is discernable by the hot iron test. Sweetly flavours result from too early drawing of the whey in May.

15. After dipping the curd, stir it gently and keep it at a temperature above 94°.

16. Don't attempt close matting, high piling or packing of the curd this month. See that the whey is separated from it.

17. When it begins to feel "slippy" and smells like fresh-made butter, it should be put through the cutter or grinder.

18. Acid develops so rapidly, that care must be taken to keep the treatment well in advance of the change in the curd.

19. After grading or cutting, stir for 10 or 15 minutes before salting.

20. Apply salt at a rate of about 1½ lb, early in the month, to 2 lb. per 1,000 lbs. of milk during the last ten days, varying the quantity slightly according to the condition of the curd as to its moisture.

21. Begin to put the curd in the hoops within 20 minutes after the salt is stirred in.

22. Use only pure water in bandaging.

23. Guard against the formation of edges or shoulders, from the hoop-followers being too small. Apply the pressure gradually until the whole power through the long lever is used, after four hours.

24. Leave the press-cloths on, and turn the cheese in the hoops every morning. Let no cheese leave the press room until the shape is symmetrical and the finish neat.

25. Don't press scaleboards on the ends of the cheese.

26. When the press-cloths are removed, use hot clean whey-oil or butter, in which has been dissolved a teaspoonful of soda per cupful of oil.

27. Try to keep the temperature of the press-room above 60° Fahr.

29. The curing room should be kept at a temperature continuously between 65° and 70° Fahr.

29. Provide strong, smooth boxes of the exact size.

30. Stencil the weight of the cheese in neat figures on the side of every box.

PATRONS.

1. Try to get each patron to take a personal interest in the care of the milk.

2. Encourage every farmer in your neighbourhood to sow a small area of oats and pease or oats and vetches for summer supplementary food.

3. Persistently endeavour to induce every patron to plant at least five acres of fodder corn in rows or hills three feet or three and a half feet apart.

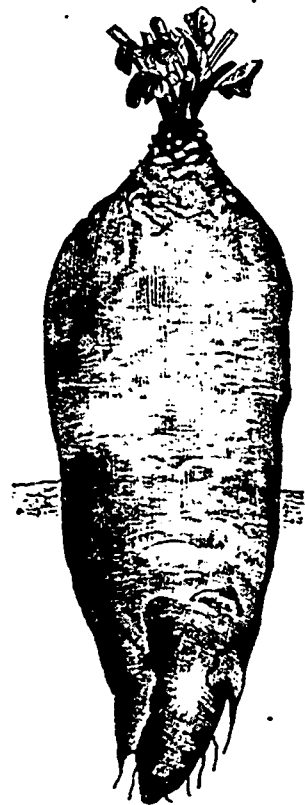
4. Send to the Dairy Commissioner, Central Experimental Farm, Ottawa, for a bulletin of instructions on the planting of fodder corn, the construction of siloes, the curing of corn, and the making of ensilage.

MANGELS FOR THE DAIRY.

Mangels are recognized in the European countries as an important factor in feeding stock, but as yet their growth is limited in America. Other feeds are procured so cheaply as to cause an indifference for this crop, that its production has been limited to those whose knowledge of its value led them to its use. The great value of the mangel for the dairyman lies in the fact that it will greatly increase the flow of milk in winter, a time when milk is in most demand, and will, to a certain extent, take the place of green food when the pastures are gone. It is also an acknowledged fact that the mangel acts as an aperient to the system, helping the animal to more readily assimilate its grain ration and to keep it in a perfectly healthy condition. When the extreme low cost of production is considered, the mangel will be found much less expensive than the silo, for which it is a substitute, and in many respects superior thereto.

Great crops are easily grown on ordinary land, sometimes yielding as much as 30 tons per acre, with good care. The great labor of raising them is in the first cultivation, when they

must be thinned out by hand, but as a small patch is all that is needed under ordinary circumstances, this labor becomes necessarily of small moment. The cost of seed is a small matter, as sufficient seed for an acre of ground can be obtained from any reliable seed house for \$2.00.



The above facts will no doubt cause many of your readers to inquire further into this matter, and for the benefit of such we will, with your permission, in another issue present an article on the growth, culture and care of mangels.

ILLINOIS DAIRY BULLETIN.

ED. HOARD'S DAIRYMAN: At an Institute recently attended by the writer there arose a very animated discussion. This was pleasing to the speaker and it is hoped the audience enjoyed it also, as discussion is one of the most valuable features of an Institute.

A white haired farmer rose in the audience, and addressing the speaker said: "My dear sir, I have milked cows for forty years, and I can't agree with your statement, that rich feed does not make rich milk."

So far as my observation goes, the general opinion among people who have only fed and milked cows, seems to coincide with that of this gentleman who had milked for forty years. During the five years that the writer milked cows, he had the same idea that is apparently so common among milkers, concerning the relation between cow's feed and the quality of milk. It is my present opinion, however, that if any fair minded man who has milked cows for forty years, more or less, had devoted one year or even six months to the accurate weighing and testing of milk daily, and kept an account of the changes in feed, he would learn many things.

How much of such work each individual can afford to do, he will probably decide for himself. No man can afford to milk unprofitable cows, and by weighing and testing their milk, he can weed out the poor ones.

The relation between feed and the quantity and quality of milk has been studied by many experimenters. The records of such investigations are an accumulation of evidence. The aim of the recorder of the figures or evidence is accuracy only, regardless of opi-

nious. What the weights and tests teach, each reader can judge for himself. If rich feed increases the richness of the milk, the accurate record will show it. The recorder of the weights and tests of milk and feed is as willing to note down one set of figures as another. His aim is to show what the cow did, regardless of what he thinks she ought to do. With this end in view and in this frame of mind, the writer has weighed and tested the milk of each of six cows, every day through the whole milking period. The live weight of each cow was recorded every week, and a history of the cow's feed and care is also given in the record. A summary of the results of this vast amount of work is given in Dairy Bulletin No 23, of the Ag'l Exp. Station, of the University of Illinois. This bulletin is now in the hands of the printer, and will be ready for distribution early in March. A new feature of this bulletin is a graphical diagram of the record of one of the cows. It shows the weekly variations in live weight of the cow and the daily variations in the weight and composition of her milk throughout the milking period. This gives the reader an opportunity to see more at a glance than could be readily obtained from the mass of figures which the diagram represents.

E. H. FARRINGTON.

Champaign, Illinois.

(Hoard's Dairyman.)

THE ECONOMICAL

PRODUCTION OF BUTTER.

BY JAS. W. ROBERTSON, DAIRY COMMISSIONER.

There is nothing sordid in economy. The economical production of anything is the result of the application of the best skill to its manufacture. Men sometimes sneer at economy, because they think it has an element of meanness in it. I know men so mean that they will clasp both hands over two cents, and grip them so hard and continuously that their fingers will be too numb to scatter the seed in springtime to get a good crop for harvest. There must first be a giving out, a liberal sowing, before there can be an abundant harvest for reaping with joy. It is economical to sow bountifully when the seed and the soil are good.

Now, in the production of butter it is always economical to recognize that economy takes cognizance of a man's environment. We can grow oranges in Canada; we have an orange tree bearing oranges in Ottawa, but it is in a conservatory. We cannot grow oranges economically in this climate. Many men try to go on doing something, regardless of the natural conditions that they find around them. Now, we have in Canada the conditions for an economical production of butter. We have, first of all, a fertile soil—a soil rich in all the elements of plant food. We have a soil which gives the largest crop of forage plants in the world, with conditions to support all animal life in robust health. We have a capable people needing occupation—needing employment. Why should a man, living in Canada, want to go elsewhere to get more room to spread himself on a great big farm? The money to-day is being made on small farms by men who farm well, and not by men who spread themselves over great areas and farm poorly. We have markets calling out for fine butter all

the time; and making butter will enable farmers to keep their land in good condition, and give them and their families profitable employment. It is economy for the governments, for the people, to do all they can to extend the economical production of butter.

It pays to concentrate the products of the soil, and sell the refined products that carry the highest value with the least exhaustion of fertility. It is a fact that in one ton of hay you will sell 85 times more from the soil than you will in one ton of fine butter, and you will get for the hay probably \$10 and for the butter \$450.

Then, in the economical production of butter, it will always pay a farmer to remember that butter is merely a kind of food whereby a man obtains energy for work. If I move my arm I rub off some of the material of my muscles—the friction has worn some off. I need something in my food to repair the waste of tissues in my body; besides, I need a supply of energy that will make it possible for me to originate and continue motions and perform the functions of living. There is nothing in fuel that will repair the waste of the cylinder of an engine; but without the fuel you could not get the motion. What does that mean? You get all energy in all food and fuel from the old sun. He streams his rays down on the earth and on and into the plants, which the soil carries. He rolls his strength up into plants, as I might wind my strength into the spring of my watch. A plant may then become food and fuel. It is economical practice on the part of the farmer to select for his fields the plants which can serve him best in that capacity. The sun can store more of his energy during a single season's growth into the corn plant than into any other plant that grows easily in Canada. A cornstalk furnishes to the cows more energy than any other plant. Then, you get this energy transmuted into butter, and you have "materialised sunshine"—energy to supply force for your work. There is economy in that method of getting the sun to serve you by means of cornstalks, cows and butter. For this reason I think that every man who helps to make a farmer have increased faith in the value of cornstalks does a service to his country. The wealth of the Western States has come practically from two sources—from the sun and from the minerals; from the sun through the cornstalks, which in various forms of derivative diet, have furnished the energy to dig up the minerals. You need not try to "bamboozle" yourselves into thinking that wealth comes into existence without somebody's effort.

Then, in the production of excellent butter, the farmer needs to have good cows. I have a great deal of respect for a good cow. I have a good deal more respect for some of the cows in my stable than I have for some men. If you will treat a cow properly, she will give back an equivalent for what she gets. She is therefore honest, and will pay for her way through life. I will hunt with a microscope in the careers of some men, to see what they have given to the world of valuable service, and cannot find it. A cow sometimes does get more than she gives. I would not spare that cow. Put her on the block; get your money out of her in that way. You think of cows as boarders, kept for the profit of the man who keeps the boarding house. Did you ever think of a man keeping a boarding house, running on the general satisfaction plan, saying that if he does not get enough from one

boarder to pay for his keep, he will get it from the other? No! he expects to make a profit on each one of them. The farmer should act in that way towards the cows. There is advantage from watching the cows and selecting the best of them. It is not so very hard to do, and most cows are capable of paying for their board in full, if they are given a fair chance. But if they are brought up the wrong way, they are sure to go astray—just like boys.

Some people have a preference for a large cow. To my mind, if I wanted a cow to consume more food than she will give a return for, I would like an immense animal. If I wanted her to pay for her board, I would just as soon have a small one. I believe I would rather have a small cow than a large one, if she will give the same quantity and value in her milk. Then there is a notion that the bigger the cow, the better the quality of her milk. It is not so. I have faith in the quality of goods done up in small packages. I want to tell you what selection has done. The Hon. Thos. Ballantyne—a man who has done more to advance the dairying interests of Western Ontario than any single individual I know—spoke lately in my hearing, and he stated that one cow in his herd last year gave 12,000 pounds of milk; another gave, 11,900 pounds in the season. They furnished milk for cheesemaking during the summer and for butter through the winter. It is possible for a farmer, by judicious selection and feeding, to enlarge the capacity of the cows in his herd. Mr. George Allan, who lives near Ottawa, is an excellent farmer. He had four cows in 1888, which gave only 78 pounds of butter each. He began to grow cornstalks, and feed these with a little bran, and in 1889 they gave 131 pounds each; and in 1890 his cows gave him 204½ pounds of butter each. See the enlargement of capacity, and therefore the economical production. It is possible to enlarge the capacity of the cow, and thus reduce the cost of production. That belongs to economy, and the wise man is economical always, because to be otherwise is to waste; and waste is worse than folly.

(To be continued.)

Farmer's Advocate.

RATIONS FOR MILCH-COWS.

Louis SIMONSON, Esquire
Manager of the
"Montreal Cotton Co."
Valleyfield, P. Q.

Dear Sir,

You ask me to give you a milk ration, with straw as the main course fodder. You have no doubt made it out yourself from my instructions in the Ensilage pamphlet. However, here is what I would advise under the circumstances:

	Subs.	Sugar.	Digestible Protein.	Ingst. Fat
12 Straw.....	12.2	4.1	0.2	0.1
2 Cotton Seed Meal 1.9		0.55	0.61	0.19
1 Clover Hay.....	3.2	1.52	0.30	0.06
2 Bran.....	1.6	0.91	0.22	0.06
2 Crushed food.....	1.71	1.13	0.27	0.06
22	20.5	8.22	1.60	0.47
1st Series				
As above with.....	20.5	8.22	1.60	0.47
20 lbs. Ensilage.....	3.74	2.2	0.18	0.08
	24.24	10.42	1.78	0.55
2d Series				
As above with.....	20.5	8.22	1.60	0.47
20 lbs. Swedes.....	2.6	1.9	0.21	0.02
	23.1	10.12	1.81	0.49

With such rations and moistened cut fodder, you should obtain in winter an average of 20 lbs. of milk with good average milk-cows.

Dm.

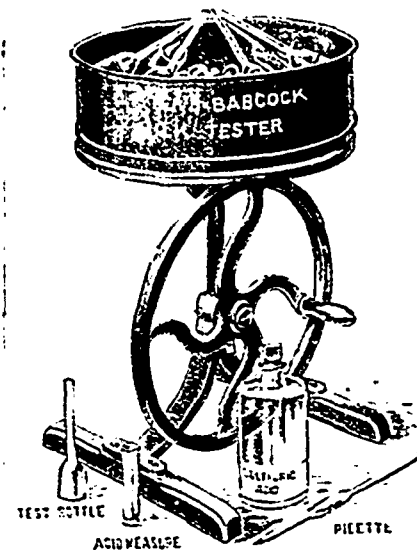
P. S.—Please let me know what you are doing in the matter and what results you obtain.

LISTER'S BABCOCK

MILK TEST.

We have frequently drawn attention to the test invented by Professor M. Babcock, chief chemist of the University of Wisconsin, the object of which is to provide a cheap, expeditious, simple, practical and accurate method for determining the quality of milk. Messrs. Lister and Co., Dursley England, have now brought out an adaptation, of which we give a sketch. They say in explanation of it:

The Babcock method, combining chemical transformations to dispose of the sugar and the casein, and mechanical power to concentrate the dispo-



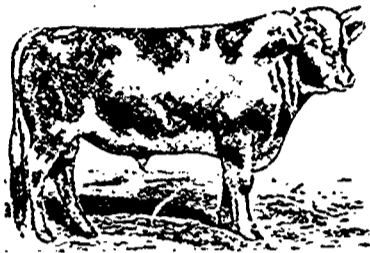
sed fat globules, is simply perfection. The test deserved a more simple and less cumbersome machine, and we take great pleasure in presenting the results of persistent efforts in that direction. Our latest is a machine without belt or cog-wheel, compact, neat in appearance, noiseless in operation, easy running, and in every way a fit companion for the perfect Babcock method. Of what use? Given a quantity of milk—the product of a single cow, or the total of a herd, large or small, as the case may be, and the important commercial question is, how much fat does it contain? The butter maker, the cheese-maker, the city consumer, no less than the farmer himself, are financially interested in the question. How shall it be answered? First, thoroughly mix the mass by pouring from one vessel into another, or by stirring, and then with the pipette secure the sample and put it into a testing bottle. Add an equal volume of commercial sulphuric acid, that has been kept stoppered, of 1.843 specific gravity. By a gentle rotary motion thoroughly mix the acid and milk. Then place the bottles in the machine and turn for ten minutes, at a speed of eighty-six to ninety turns of the handle per minute, then stop, and fill the tank with water at a temperature of 190 degrees F., and at the same time fill bottles to the 7 per cent. mark with water of the same temperature; this may be taken with the pipette from the hot water tank. Be careful not to have the water above 190 degrees, as it may burst the bottles. When this is done, put the bottles back into machine, and turn it again for two minutes. The bottles can then

be taken out, hold in a vertical position, and the amount of butter-fat read off in the gradual tube.
It may be 3.2, 4.4, or 5.6, or more or less, and this determines the value of the milk, just as the assayer fixes the value of ores by testing samples. Ex.

GUERNSEYS.

The "ideal Guernsey" is thus described by the manager of the Hon. Levi Morton's well known herd:

"Our bull, Midas, pictured in last year's R. N.-Y. is about perfect in shape and color. We want a cow weighing 1,000 pounds, long, with well sprung ribs and plenty of room for feed. Color, orange fawn and white, with a handsome but subs-



tantial carriage. We shall not try to breed simply a large Jersey, but a different type entirely, with nothing of the delicate, deerlike head and neck or slenderness of the Jersey. It will be a stout, muscular, brawny dairy cow. It will be like the difference between a 25 and a 20 horse-power engine. We want 10 of our Guernseys to do the work of 12 Jerseys.

The following description of the Guernseys, as distinguished from the Jerseys, is taken from the R. New-Yorker, one of whose staff "interviewed" the manager of Mr. Morton's herd last month. The type of the Guernsey has been so long fixed, that we were rather amused at the second question. We have bred them ourselves, and know their value. Ex.

1 "In what respects do Jerseys and Guernseys differ?"

"Chiefly in size, vigor, disposition and feeding habits. The milk of the two breeds is just about the same—no expert can tell the two apart. The Guernseys are, on the average, heavier milkers and their milk may have a little higher color. They are heartier eaters as a rule. They average heavier than Jerseys, and never having been closely bred or pampered, are freer from disease and more vigorous in constitution. The chief difference is in disposition. They are not nervous and high-strung like the Jerseys. A Guernsey is really a dignified Jersey—like one that has grown up and sowed all the wild oats in the basket and settled down for business only. Guernseys are the best barn dairy cattle in the world. They are perfectly at home at public shows or contests while Jerseys are usually too excited and frightened to do their best. The Guernseys can be shipped and handled easier and have a greater capacity for turning food into milk when fed in a barn.

2 "Shall you aim to make a general-purpose cow out of the Guernsey?"

"Not at all. She will be bred for the dairy alone. She will be simply a larger, stronger and quieter animal than the Jersey; better suited to winter dairying because she is happier when confined to the barn."

(3) "What arguments can a Guernsey man give in favor of his breed?"

"Those I have given in regard to size, vigor and disposition. As to rela-

tive profit in breeding stock—the Jerseys are somewhat cheaper now, particularly for bulls, and Jersey families are well developed and lines of breeding have been carefully traced. The Jerseys have had their boom, however, and the day of high prices has departed. The interest in Guernseys is growing all the time—their boom is ahead of them, not behind. When both breeds come down to the business of contesting for the patronage of practical dairymen the Guernsey will win because she is a business cow made for the farmer rather than for the fancier. Men who now stock up with Jerseys will find their cattle constantly growing in favor and value as they become better known, and while the cost of starting a Guernsey herd may be greater, the possibilities of selling stock are also greater in the end."

H. W. C.

Science.

The Food of Plants.

III.

THE APPROPRIATION OF FOOD.

By D. P. Penhallow.

The appropriation of food, or the organs through which food elements enter the plant and the forms in which these elements are taken up, is at once one of the most interesting and important of the whole question of plant nutrition, since it constitutes the basis of those extended operations which are involved in the cultivation of crops.

As there are two principal sources of food, the soil and air, there are also, corresponding to these, two principal organs or sets of organs through which food from the surrounding medium gains access to the living cells. These are the leaves and the roots, and in order to gain a just appreciation of the way in which these organs operate, it will be well to briefly consider their structural adaptation to the functions they are called upon to perform.

If a section of a leaf be made in such a way as to expose its thickness, and examined microscopically, it will be seen that the upper and lower sides are bounded, each by a layer of cells, which, while similar to one another, differ widely from those cells which lie between and constitute the principal part of the leaf structure. From the position occupied by this external membrane, as well as from other considerations, it is known as the epidermis or skin, the general function of which is protective, while it also serves in many cases, to limit certain functions and keep their operations within well defined limits. This is to be observed with respect to the function of transpiration where we find that in general, the thicker the epidermis, the slower will be the rate at which water is given off from the plant, and we may gain corroborative evidence of this statement in the observation that plants growing in very moist situations have their epidermal tissues developed but slightly, while plants growing in very dry regions usually have very thick and resisting skins. All this points directly to the fact that the more highly developed the epidermis becomes, the more completely does it resist the passage through it of water in the form of vapor. On the other hand such membranes are very porous with respect to gases, so that the ordinary gases of the atmosphere readily pass through the epidermis, inwardly or outwardly. This is susceptible of de-

monstration and has repeatedly been proved experimentally, and, as we shall shortly see, it has an important bearing upon the appropriation of atmospheric food by the plant.

Here and there in the epidermis may be seen openings which pass through and connect with spaces in the interior of the leaf, or if we look down upon the epidermis, these same openings will appear as oval structures with a central orifice or mouth. Such openings are known as the stomata and are often called, though erroneously, the breathing pores. These organs are very sensitive to varying conditions of light, and under its influence are capable of opening or closing accordingly as they are brought, under the operation of bright light or of darkness. It therefore follows that as these conditions vary, the amount of gas and vapor of water passing through these openings must vary within a given time. It should be pointed out here, however, that these organs are almost wholly connected with the liberation of water in the form of aqueous vapor, and are of subordinate value only, in promoting an interchange of gases, since as we have already seen, these latter are capable of passing through the epidermis when devoid of stomata, and moreover, such interchange of gases is a common function of plants which never possess stomata. We may thus say that, while stomata are not essential, they may facilitate diffusion of gases, since this always takes place more readily through definite openings than through closed membranes.

With respect to the distribution of the stomata it may be well to point out that they occur on the young parts of all green plants, on leaves, flowers and fruits. They may often be found on certain underground structures, but are never to be observed on roots. They always occur most abundantly on leaves and in the majority of cases are most numerous on the lower sides of these organs. There are notable exceptions to this, however. In grasses where the leaves are equally exposed on both sides, the stomata will be uniformly distributed above and below. Leaves growing horizontally show an excess above and below according to surrounding conditions, while leaves growing with the lower surface in water, have all their stomata on the upper side. These facts will be made clear by the following tables:

NUMBER OF STOMATA PER SQUARE CENTIMETER.		
	Upper	Lower
<i>Box, Buxus sempervirens</i>	0	208
<i>Sunflower, Helianthus annuus</i>	175	325
<i>White Water Lily, Nymphaea odorata</i>	160	0
<i>White Pine, Pinus strobus</i>	152	0
<i>Pinus sylvestris</i>	50	71
<i>Black walnut Juglans nigra</i>	0	461
<i>English walnut " regia</i>	0	299
<i>Olive, Olea europaea</i>	0	1072
<i>Brassica hirta</i>	158	243
<i>Ficus elastica</i>	0	145

Or, taking the whole number of stomata upon leaves of average size, we find the following:

<i>Acer platanoides</i>	2,127
<i>Quercus cerris</i>	2,136
<i>Nymphaea alba</i>	7,650
<i>Brassica oleracea</i>	11,500
<i>Helianthus annuus</i>	141,000
<i>Victoria regia</i>	1,055,000

It commonly happens in woody plants as trees and shrubs, that the epidermis is very soon replaced by a layer of cork which is in itself impervious to gases, and, therefore, the interchange which formerly took place through the bark is wholly terminated and the leaves are thereby forced

to perform more than their normal share of work. To compensate for this, it is found that as the cork layers form, the structure becomes modified at frequent intervals, in such a way as to establish more or less spongy structures called lenticels, which contrive to maintain communication between the external atmosphere and the interior of the plant, and thus permit a continued interchange of gases. These structures are familiar objects on the bark of trees and are particularly conspicuous in the birch, where they form transverse marks of a light brown color and tend to hold the various layers of the bark together. For agricultural purposes these organs are of minor importance, except so far as we take into consideration the cultivation of fruit trees, but for an intelligent discussion of the question now under consideration, it is important that we keep their physiological value clearly in mind.

Passing on to the principal structure of the leaf, it will be found that immediately below the upper epidermis there are one or more rows of cells of cylindrical shape arranged in compact rows and placed vertically. These cells from their form and arrangement constitute what is known as the palisado tissue. The cells are very active and contain numerous granules of green coloring matter known as the chlorophyll. During active growth they also contain great quantities of starch. Extending from this tissue to the lower epidermis, and generally occupying about two-thirds of the thickness of the leaf, is a tissue which differs materially in its structure. It is composed of irregularly rounded cells so arranged that the whole structure is traversed by numerous spaces which connect with one another throughout the leaf, and they outwardly connect with the air through the stomata. This structure as a whole, is called the spongy tissue in allusion to its characteristic structure. The cells are very active and contain a large amount of chlorophyll. These and the cells of the palisado tissue, are the working cells of the leaf, since it is in them that respiration and all the changes incident to the fixation of carbon take place.

The atmosphere of the earth will be found to contain in every one-hundred parts:

Nitrogen (N.)	79.01984
Oxygen (O.)	20.94000
Carbon dioxide (CO ₂)	00.04000
Ammonia	00.00016
	100.00000

We may therefore say, as commonly stated that the air consists of four-fifths nitrogen and one-fifth oxygen, with small quantities of carbon-dioxide. Of these the nitrogen and ammonia are not capable of being taken up by the aerial portions of the plant, but, as we shall see later, they may and do pass down into the soil where they are taken up by the roots and constitute most important elements of food. We may thus leave them out of the present consideration.

The oxygen furnishes the element which is essential to the respiration of the plant. Without it all growth would cease. By diffusion it passes through the outer membranes of the plant, and also through the stomata when present, into the interior living cells where it comes in contact with various forms of carbonaceous substances. These latter are consumed or oxidised, and in the process carbon dioxide and water are formed and given off into the surrounding air, while at the same time a certain

amount of heat is formed, and through these changes there is produced that energy which enables the plant to continue the general functions of growth.

The carbon dioxide of the air, though present in such minute quantity, is quite sufficient for the requirements of vegetation. As it is exhausted by the growth of plants, it is as constantly being returned by the respiration of animals, by the decay of both animal and plant remains and by the consumption of fuel in houses and factories, so that the amount is fairly constant, although somewhat greater near large towns and manufacturing centers than in the open country.

The gas passes into the plant through the pervious epidermis and also through the stomata when present, and is thus brought directly into the living cells of the plant. Here it comes in contact with water brought up from the soil, and these two compounds are then broken up into their constituent elements oxygen, hydrogen and carbon, which again unite in different proportions giving rise to solid products such as starch, and ultimately to sugars, oils, &c., together with free oxygen which is then returned to the atmosphere. These changes may be represented in a general way by the following chemical equation.

$$6(CO_2) + 5(H_2O) = C_6H_{10}O_5 + 12O$$

from which we learn that six molecules of carbon dioxide (CO_2) in connection with five molecules of water (H_2O) will give rise to one molecule of starch ($C_6H_{10}O_5$) and twelve atoms of free oxygen. Or if we state this in measures of weight, we find that for every 162 pounds of starch formed there will be required ninety pounds of water and two hundred and sixty-four pounds of carbon dioxide, while one hundred and ninety-two pounds of oxygen will be returned to the air.

The starch thus formed at once goes to the building up of new structure, or if the growth of the plant is slow, as towards the end of the season, the excess of nutriment formed, is stored up to meet the requirements of growth at some future time, and thus we gain an insight into those processes upon which depend the entire value of farm crops for purposes of human aliment. One fact is made prominent in the changes noted, and that is, that the fixation of carbon from the air results in a direct increase of the dry weight of the plant, while from what has already been seen concerning respiration, it becomes obvious that its effect is the direct opposite.

It is now essential that we note the conditions under which these important changes take place. Carbon dioxide can be taken up from the air only by those plants which are green or contain chlorophyll. Therefore, we may reasonably conclude that such colorless plants as the mushroom must depend upon some other source for their carbonaceous food, and this source we discover to be in decomposing animal or vegetable matter.

A second essential condition is that plants be under the influence of sunlight. When a green plant is transferred to a dark room the fixation of carbon wholly ceases, and the same is true of all plants at night. The growth of plants during the night is thus dependent upon the food accumulated during the day time, while the growth of bleached celery or of potatoes sprouting in a dark cellar, is likewise dependent upon the food already stored up in the tissues, and the growth must in all its essential aspects, be like that of the mushroom.

It may of interest to note in passing

that this function in plants has, in past ages, exercised a most important influence upon the atmosphere of the earth and consequently upon the development of the higher forms of animal life. During the carboniferous age, the atmosphere of the earth was heavily charged with carbon dioxide and air breathing animals were unknown. At that time vegetation was extremely luxuriant and as it drew the carbon dioxide from the air, the latter became gradually purified until it eventually acquired the composition we now know. But the carbon accumulating in vegetable remains through long periods of time, eventually passed into the condition of coal as we now find it.

From the statement already made respecting nitrogen and ammonia, it might be inferred that leaves of plants are wholly incapable of taking up nitrogenous matter. While this is true in general, we must point out a limited exception to this law.

Certain plants such as the flytrap and the pitcher plant have for a long time been known, as was shown very clearly several years since by Darwin, to possess the power of digesting insects and even meat, and in consequence are known under the general name of insectivorous plants. It has for a long time been a matter of speculation how this digestion is accomplished, but recent investigation show that when an insect is brought in contact with the leaf of such a plant, it throws out a certain secretion which favors the rapid development of bacteria. These latter then seize upon the insect or the meat and convert it into soluble albuminoids which can then be taken up by the plant. The inference that these organic substances then serve as food is a justifiable one, but it is altogether improbable that the plant is in any way dependent upon food so obtained. While this process is of great interest from a scientific point of view, it has no value with respect to agricultural operations, since none of the plants having this power bear any relation to human aliment.

We may then recapitulate the leading points raised:

1. The food elements of the air are carbon and oxygen.
2. The air is the only source of carbon to the plant.
3. These gases are taken into the plant as free oxygen and as carbon dioxide.
4. The oxygen is essential to respiration.
5. The carbon dioxide is essential to the formation of new structure, and its fixation results directly in an increase of dry weight through the formation of starch and allied compounds with the liberation of free oxygen.
6. Carbon can be fixed only under the influence of chlorophyll and sunlight.
7. These gases enter the plant by diffusion through the epidermal membranes and also through the stomata. The leaves of plants are incapable of taking up the free nitrogen and ammonia of the air.

9. In a few cases, the leaves of plants may take up soluble nitrogenous matter

FIFTEEN M. C. 1.5

BY A TROUT BROOK.

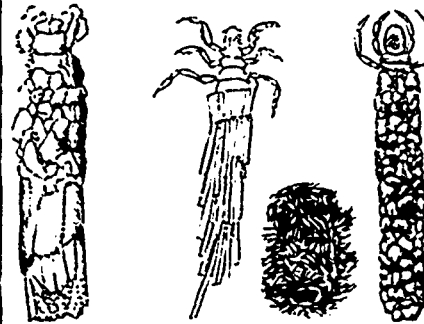
R. E. H. LOWE.

Come over the pasture bars and down by the brook, I have a small pet to show you. No, it is not the

fish you know so well from tip to tail. But you are a beauty, Mr. Trout, and how easily you float! That is because of the silvery gas bag fastened beneath your spinal column. We also know about the luck stones floating in your bony ears, and that you are able to keep your mouth open so long without drowning because the water passes through the mouth and over that pile of blood-red brushes, or gills, inside, by means of which you breathe. So no wonder you gasp and die as soon as you are taken out of the water. But you need not eye so hungrily that poor little thing down on the bottom, just thrusting his head out of his front door. If you try to gobble him up, you will have your labor for your pains, for, like a flash, his head will disappear, dart after him as quickly as you may.

This little creature at the bottom is well worth our attention. Can it be that the tiny mite built the wonderful stone mansion himself? He must have a glue-manufacturing establishment in his body, instead of an air bladder. See the little house, a two-inch cylinder, a quarter of an inch in diameter, fashioned from gravel stones and sticks, just big enough to hold its occupant. He is quite modest, for, you see, he has put his brown stone front in the rear.

Now take the little builder up, house and all, and hold him in your hand. Try to pull him out of his case, and you will find that he has hooked himself in by his hind feet. If he feels lively, he will try to get away from you by biting hold of the skin of your hand with his strong jaws, and pulling himself



HOUSES OF THE CADDIS WORM.

and his house along so rapidly that he sometimes turns somersaults in the effort. And now comes the pathetic part of his history. After this lowly creature has spent the most of his life in the water, he suddenly closes up his front and back doors, shutting himself in for two weeks, during which he is perfectly quiet. At the expiration of that time he emerges, an entirely different creature, looking like a small moth. But his strong jaws have disappeared, and he is provided instead with a weak sucking tube. So he flutters around for a few days, and then dies. The female lives long enough to lay her eggs on a stem in the water, so that the young may hatch out in their native element. Before this transformation my pet's name is "Caddis-worm," afterwards, "Caddis-fly." She has relations to be found on the bottom of almost any small stream. Some of them live in log cabins, made of tiny sticks; others in houses of moss; and still others in green houses, made of leaves chewed up and fastened together, forming a case with a small opening through the centre for its builder. Some forms of these interesting houses are shown in the illustrations. Ex.

ALL ABOUT CUT-WORMS

DESCRIPTION OF THE PEST—HABITS—APPEARANCE OF THE MOTH AND THE WORM—REMEDIES, NATURAL AND ARTIFICIAL.

The term cut-worm is very loosely used, being often applied to the larva of the June bug, which cut grass roots; to the wire worms, the larva of the snapping beetles, and even to the borers that cut channels in woody plants. The term cut-worm is principally confined by entomologists to larva of the Owllet Moths (*Noctuidae*), that have the habit of hiding just under the surface of the ground during the day and feeding upon the roots, stem or leaves of plants by night. When the larva climb high and feed upon the foliage of tall plants or trees, they are called climbing cut worms.

The cut-worms may be known by the following general characters: The moths known as Dart Moths or Owllet Moths are deltoid or triangular in



FIG. 1.

shape when the wings are closed, and usually fly at night, and often enter rooms, being attracted by the light. The worms when full grown measure from one to two inches in length, have sixteen legs, thick bodies which taper somewhat at the ends; without hairs and greasy looking, brown gray or greenish with indistinct longitudinal or oblique markings; head, long, shining red or brown, head and anal segments armed above with a horny plate, darker than the remainder of the body. On each segment are six or eight dark colored humps, each bearing a hair. When disturbed, the worms curl themselves into a ring. There are upwards of three hundred species, one of the most common and destructive is the greasy, or black cut-worm.

The larva, (Fig. 1) or worm, when full grown is about an inch and a half long, a dull red brown color, with five paler stripes running along the body, the under side of the body being pale greenish yellow.

The moth (Fig. 2) has dark forewings with a bluish tinge on the front border and with a dark brown lance-shaped mark running from the posterior portion of the kidney-shaped spot in the middle of the wing. Hind wings

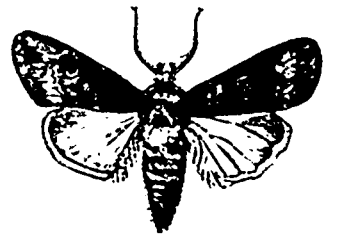


FIG. 2.

are pearly white and semi-transparent. There are two broods, and the moths are on the wing from April to October.

The natural enemies of cut worms are various species of parasitic and predaceous insects, birds like the robin, starling, catbird and poultry, and animals like the skunk and mole.

Among artificial remedies we name preventive measures, a handful of salt on the surface of the plant hill, tobacco dust about the stem of plant, paper, burdock or walnut leaves wrapped around the stem of the plant, paper or tin tubes slit at one side slipped over the stem, or dusting dry

powders like hellebore, air-slaked lime, ashes and pyrothrum about the stems and on the foliage of plants.

Among destructive measures we name early fall plowing which covers up the food of the young worms and leaves them to starve, late fall and winter plowing which exposes them in their winter quarters to perish, dipping plants to be set in a solution of hellebore (one pound to ten gallons of water), or Paris, green (one ounce to eight gallons of water), digging out worms by hand where plants have been cut by them.

An effective method of saving a crop from their ravages is by poisoning them before the plants are set or a crop like corn comes up. To do this, grass, clover, cabbage or turnip leaves are dipped in Paris, green water and scattered in small handfuls over the garden or field. A stone or piece of wood laid on it will keep the poisoned trap from drying out or blowing away. The green stuff may be moistened and poisoned plaster or flour dusted over it. Of course, poultry and animals that will be injured by eating the poisoned greens must be kept out of the field.

Kerosene emulsion has been successfully tried at the Department of Agriculture, Washington, D. C., for destroying root eating grubs in grass grounds, and would, without doubt, prove as effectual in killing cut-worms under similar circumstances. The places affected were thoroughly drenched with an emulsion of kerosene in the proportion of one to sixteen, and the ground then well watered. Where this emulsion was used the grubs immediately ceased their depredations, penetrated further into the ground and not a live one was afterward found. For this emulsion, dissolve a quarter pound hard soap in two quarts boiling water, add one pint of kerosene and churn violently until the emulsion "comes." Add to this two gallons of water. Before sprinkling the sod dilute as above.

For cuts and many of the facts herein given we are indebted to a bulletin of The Maine State Experiment Station.

(Farm Journal.)

Farm-Notes.

Montreal, May 1st.

What a pleasure to be able to write the above date! After such a winter the first sensation of genial weather is doubly welcome, and the sight of the expanding buds of the soft-maple, the twittering of the sparrows, already hatching at their first-brood, and even the harsh cry of the immigrating crow, and the dull croak of the frogs celebrating their betrothals in the reedy pool, bring the "pleasant-time of spring" poetically present to our eyes. But all is not gold that glitters, nor does the farmer invariably feel at ease when the early days of May present themselves. The hay-mow has shrunk considerably during the past five months; the straw, that was eagerly devoured by the cattle when it came fresh from the threshing-machine, begins to pall on their appetites, and the restlessness of the older cows shows how anxiously they are waiting for a chance to free themselves from the confining chain, and wander at will over the well-remembered pastures. The master of the herd knows very well from past experience, that when a cow once gets "the fidgets," her yield of milk falls off terribly both in quality and quantity. He is sorely tempted to let them out, if only for a couple of hours run, half persuading

himself that it will do neither cows nor the grass much harm.

But, he is *pas si bête*, after consultation. He remembers to have read in some old-time newspaper a paragraph stating that Dr Acland, the Professor of Botany at the University of Oxford, after a series of patiently conducted experiments, proved that if the first spring-shoot of grass is cut or eaten off, the total yield of the plant during the season will be diminished by one-third.

Again; the farmer knows that if once his cattle got a taste of the green grass it will make them dainty; they will turn up their noses at even hay, and as for straw, they will none of it: so, upon the whole, he makes up his mind to keep his stock in the yards till the real flush of growth is on the pastures, and the signs are that the food will last them till the time for cutting green-meet is at hand.

Once more; the grain the farmer has been giving to his milch-cows that are in profit he will not withdraw from them all at once, even if he cannot persuade himself to continue it to them all the season. If they must be deprived of it, he will lessen the rations by degrees, even after they go to grass, for he knows of a certainty that the rank, succulent grass of the early spring has no proof in it; that it does not contain anything like the same amount of the elements of fat and casein that the grain does; and that a mixture of foods, moist and dry together, is always more conducive to the health of stock than any one article of food given alone.

Lastly; the farmer, particularly if he cultivates heavy land, remembers that wherever cattle put their feet before the land is fairly dry, a hole is made that retains water like a cup; and that timothy-grass, the chief component of his pastures other than the permanent pastures so rare in this country, is of a bulbous nature of growth, and that *faute de mieux*, if the keep run short, the cattle will tear it up by the roots and an irremediable gap will be the result. Upon the whole, the farmer comes to the conclusion that he will not risk it, and will keep his cattle in their winter quarters till the pastures are really fit to receive them, even though the days be warm and the grass growing nicely.

MALT.

Among the various things we meet with in our exchanges, nothing surprises us more than the various opinions expressed by even practical men as to the feeding value of Malt. Senator Cochrane told us, some 20 years ago, that he found it a most valuable addition to the food of his fine herd, but more as a medicine than as a producer of milk or meat; which we interpreted to mean that it acted, like pepsin, and aided in the digestion of the ordinary rations.

Now, what is malt? Wherein does it differ from the barley from which it is made?

Malt is thus manufactured: A quantity of barley is steeped in water for a number of hours, varying from 48 hours for 4- or 6-rowed, to 72 for 2-rowed barley: it is then turned out, after draining, into the *couch*, where it lies for a day or so, and after being turned on the *floor*, in layers of varying thicknesses, when the *acrosipire*, or what would become the green shoot (*plumule*), has sufficiently advanced up the back of the grain, the malt is put on the kiln and dried. In the process of drying, the rootlets, by the shortness and bushiness of which the skull of the

maltster is shown, become brittle, and form, what are called in England, *cummins*, a very valuable food for cattle when properly used.

The changes undergone by barley between the *steep* and the *crusher* are given by Dr Thomson, in his "Experimental Researches into the Food of Animals" as follows:

	Barley.		Malt.	
	Natural state	At 212°	Natural state	At 212°
Carbon	41.64	46.11	42.44	43.93
Hydrogen	6.02	6.65	6.64	7.00
Nitrogen	1.81	2.01	1.11	1.29
Oxygen	37.66	41.06	43.08	46.51
Ash	3.11	4.17	1.68	1.27
Water	9.46	...	5.05	...
	100.00	100.00	100.00	100.00

Thus, it will be seen that barley loses carbon, in the form of carbonic acid, and nitrogen, in the form of albumen, while the malt gains hydrogen and oxygen, i. e. water; so that 100 lbs of barley are reduced by the process of malting to 80 lbs. of the finished product, that is, the loss sustained by the barley in its conversion into malt is something like this:

Water.....	6.00
Saline matter.....	0.48
Organic matter.....	12.52
	19.00

Practically, barley that weighs 56 lbs. a bushel should make malt weighing 44 lbs. a bushel; but, that is not all; the increase of measurement owing to the swell of the grain is from 8 0/10 to 12 0/10, and, in Essex, England, we have even seen as much as 15 0/10 of increase; so that 100 bushels of barley will yield as much as from 108 to 115 bushels of malt. And this will account for what puzzles many people in the English market reports, viz. that while the best Saale barley is worth from 38 to 46 shillings a quarter, the very best malt is quoted at 36 shillings: it is the increased measure that pays the maltster.

Many years ago, when there was a very high duty on malt in England,—it is now levied on the beer—farmers, in that country were very anxious to get the duty taken off, in fact, to have all excise restrictions removed from its manufacture, so that they might malt their own barley for cattle-food. This was granted, with this proviso, that the excise-officers should be allowed to mix some evil-tasting stuff with the malt so made, to prevent its conversion into beer. However, the few farmers—Norfolk men, principally—who tried it soon gave it up, as they found, as the chemist would have told them, that raw barley produced more milk and meat than could be got out of malt.

But, in spite of this, we believe that malt, if there were no duty on it when used as cattle-food, would be a profitable article for milk-production, when combined with other grain. Let us see what is the peculiar behaviour of malt in the brewer's mash-tun.

The operation of malting converted the insoluble starch (*hordein*) in the grain into soluble gum and sugar. But another change took place: part of its nitrogenous matter was converted into a substance called *diastase*, which has the marvellous effect of changing 2,000 lbs. of starch into gum and sugar, when mixed with water at about 160° F. The brewer stirs into a certain quantity of water at that temperature his grist of malt, and after the expiration of about 15 minutes, the thick-mash becomes, in a flash, liquid, and the action of the *diastase* is distinctly visible.

Now, as *diastase* has, as we have seen, the power of converting such an immense quantity of starch into gum first and then into sugar, the *distiller*, who is generally sharp enough, set to work on experiments, and soon discovered that it was not necessary to employ a grist of pure malt for his *mash* but that the addition of 10 lbs., about, of crushed malt to 50 lbs. of ground maize, or other grain, would yield him as great a return of spirits as a grist of pure malt: as great in quantity, that is, though far inferior in quality.

So, if any farmer wishes to use malt though with 2 cts. a pound duty on it, as it has to bear at present, we fear it would hardly pay,—his best plan would be to take 50 lbs. of meal—barley or maize—and after stirring it up in water, at about 175° F., till it is all equally mixed, let him add 10 lbs. of malt, crushed coarsely, and let it stand in a warm place in winter, for an hour or two, close covered. The mixture will be very sweet to the taste, showing that the *diastase* has done its work, partially at least, of converting the starch into sugar. This we believe, even now, would be found a most useful appetiser for bad feeders, and we will engage that, used with a ration of clover-hay-chaff, crushed linseed, and horse-beans or pease, it would bring a horse into show-order quicker than any food that could be exhibited.

DE CANDOLLE.

We regret to say that the great Swiss Botanist, M. de Candolle, is dead. His father, the celebrated Augustin de Candolle was the first *savant* to explode the long-held theory that plants left in the soil certain *excreta* that rendered it inimical to plants of the same species; replacing it by the true principle that plants took so much food out of the soil specifically suited to their wants, that if plants of the same species followed immediately after them, the land was incapable of supplying them with the specific food required.

"PHOSPHATES."

When M. le Comte des Etangs was lately on a lecturing tour, he was surprised to hear people talking about "phosphates," meaning, thereby, chemical fertilisers in general. We have often animadverted on this careless nomenclature in the Journal, and we are glad to see that, at last, the agricultural papers of the United-States are beginning to find fault with it. In the "Rural New-Yorker," of March the 20th, we find the following severe expression of opinion—not a whit too severe, though:

ANS.—1. That is a small amount of chemical fertilizer to use if it contains the three most important constituents in the right proportion. Our inquirer speaks of *phosphate*. Does he mean a fertilizer containing phosphoric acid only, or a "complete" fertilizer? It is a pity that both fertilizer firms and rural journals cultivate this stupid misuse of names.

Dr Hoskins, too, has often rebuked the improper phraseology in the Vermont Watchman.

The Largest Farm in England.

There is a larger farm in England than Witheall farm, near Louth. The Apothorpe farms, near Wansford, in Northamptonshire, tenanted by Mr. Andrew Montagu, contain 4,350 acres, of which 2,550 acres are arable, and 1,800 acres pasture. Some ninety-four men and boys are employed in winter,

and about double this number of people in harvest. There are ten sets of farm buildings, with steam chaffing and corn grinding machinery. An 8-h. p. traction engine, by Fowler and Co., and a threshing machine, by Clayton and Co., are regularly employed from October to June; also about nine months of the year a double set of Fowler's 16 h.p. compound engines and cultivating tackle. The live stock consists of about 3,000 sheep, 500 cattle, 95 horses, and 350 pigs. The cost for labour alone runs from 15s to 16s 6d per acre on the 4350 acres.—

NORTH BRITISH AGRICULTURIST

The above paragraph struck our eye just after we had been reading an article on thick or thin seeding in the Country Gentleman. The writer of that article, on the whole a man of sense as far as his opinion on the main subject he is treating goes, makes the following mistaken statement:

"The English farmer has few acres." As far as that goes, I can assure C. K. Smith that a man who farms less than 300 acres of mixed land would be considered a small farmer. It is quite true, as Mr. Smith goes on to say, that "the English farmer puts as much fertility and labour on one acre as the average American farmer does on several," but his idea of England being a country of small farms is an utter error. Here and there in the neighbourhood of towns and in the dairy-districts, small farms may be met with; but, as a general rule, the agents of the proprietors take good care that the number of tenants shall not be too great. The larger farms, running from 500 to 1,500 acres are far better cultivated than the smaller ones, which are generally in the hands of an inferior class of men with but little capital.

What size were the farms in our neighbourhood in Essex before we left England? We remember most of them: Sam. Jonas of Chrishall Grange—2,200 acres; Jonas Webb of Babraham 1,500 acres; Sam. Webb of Babraham, 1,200 acres; John and Thomas Webb near the same place, 1,200 acres each; John Clayden of Saffron Waldon 1,100 acres: all these men were within easy walk of our own farm, and there were no end of others holding farms on the same scale.

By the bye, we are rejoiced to see two such men as the Asst. Commissioner of Agriculture and Dr. Hoskins, of the Vermont Watchman acknowledging the fact that, as the former said at the Meeting of the Dairymen's Association of the province of Quebec at St. Thérèse, last January: "I have had to study the laws governing agriculture, not only in the different provinces of Canada, but in foreign countries also, as well as the working of their agricultural institutions, in order to make a comparison between them and those that exist here. We should always endeavour to profit by the experience, the knowledge and the enlightenment acquired by foreigners. It is so much work done ready to our hand, and we can make use of it, without undertaking any very arduous toil."

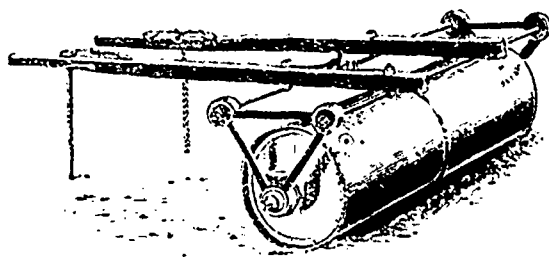
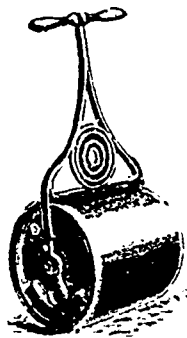
And Dr. Hoskins said pretty nearly the same thing in almost the same words, allowing for the difference between the French and English languages; his letter is so flattering to our self-love that we almost blush to quote it; however, here it is, in part, that is:

"All which you write is most interesting to me, because, among many other good things, I get in it, in a wholly reliable form, something of the spirit of the English agricultural press, which, with your comments, helps to

keep me au courant of the best farming on earth. This continent—a Greater Britain—has still to sit at the feet of the farmers of our 'old Home,' for a while, before it can claim any considerable eminence in either the art or science of terra-culture. It is therefore very important for American farm-writers to keep themselves as well informed as possible on the work of British cultivators; and the more you can give us of that along with your illuminating commentary, the better we shall like it."

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ENGLAND'S GENTLEMEN FARMERS.

A LARGE NUMBER OF THESE WILL BLESS THE NORTH WEST.

Our North-West is to receive large numbers this season. The Manitoba Government is cooperating with the C. P. R. to bring the claims of their splendid country before the farmers of the Old Country. Already the stream has begun to flow. Seven hundred immigrants passed through the city to day on their way to the North-West. They were as a whole, the finest party that has been noticed for years. They were all Old Country people, chiefly from the midland counties of England, and belonged to the class which is known there as "gentlemen farmers." Men, women, and children, they were dressed like people of large means. They had plenty of baggage and money, and are going straight to take up large tracts of land. Twelve hundred more of a similar class are coming out on the "Van cover" shortly. A portion of the first party came up on the Grand Trunk from the "Parisian."—*Witness*.

The above is remarkable for its utter ignorance of the subject it is talking about. If seven hundred of the class, called in England "Gentlemen Farmers," came to Montreal in an immigrant train, we can only say that we should like to have seen them. A more ridiculous *réclame* we never saw. And twelve hundred more coming!

TO FEED OR PLOW CLOVER.

B. F. S. Coalport, Pa.—My farm is poor; what is the best way to bring it up—to sow clover and plow it down, or to keep cows and cut the hay off of it and put the manure on it?

Ans.—We do not know; there are too many conditions that enter into the problem to make any off-hand answer valuable. Poor land cannot be made good without adding fertility in some form. Is the soil good enough to grow clover without manure or fertilisers? What crops do you want to

grow after you bring the land up? When you plow in a crop of clover, you put the value of that crop in the soil for the benefit of some succeeding crop. What is that to be? In other words, what is your money crop on which you would use manure? Is it wheat, potatoes, corn, or what? As to which is cheaper, clover plowed down or cured into hay and fed to stock. That depends upon the farm and the stock. Hogs might be pastured on clover and the sod plowed after they have been taken off for fattening on corn. In this case, the feeding value of the clover would be obtained at the least cost, and hogs promise to be profitable for several years at least. To cut, cure and feed grass to stock seems like the fundamental principle of farming. It is when the meat, milk or

butter produced from the hay come to more than the cost of cutting, curing and feeding it. The manure resulting from feeding the hay is worth no more than the entire crop plowed under would have been. Nobody can say where hay is made richer in manurial elements by passing through an animal, and twice as much fertility will be washed out of the barnyard as is washed out of a sod. Is not barn manure richer than a sod? Yes, if grain was fed with the hay, and, by using chemicals on the field with the clover, you can get just as good manure as you can find in the barnyard. Clover hay alone in the barn will not make cows pay, and neither will clover sod. One in the field make crops pay forever. It will for a time on good soil very carefully tilled, but sooner or later it will need help. That help must come in the form of manure made from grain, fed on the farm or from fertilisers. Do your cows pay a profit on the cost of getting hay into their mangers? If they do not, it is cheaper to let the clover rot down in the field where it grew, and spend the money you would have spent buying grain for chemicals to go with the clover. Either this, or let hogs eat the clover on the ground. That is all the difference there is between live stock farming and chemicals and clover farming. Many farmers will not believe that they are feeding stock at a loss if a fair valuation is put on their own time. Just figure on it and see.—R. N. Y.

RAPE AND TARES.

Mr. Shaw, of the College at Guelph, has a very well expressed article, in the R. New-Yorker on the growing of tares and rape as a means of restoring worn-out land. We have gone over the same ground so often that it is unnecessary to travel it again; only it would be as well to say that, if the preparation of the field be thorough, sowing the rape broadcast is the usual practice in England, and would be far better here were labour is so high. About 6 lbs. an acre is the quantity of seed required to cover the ground and it may be either harrowed in with the chain or the bush-harrow, or by the

roller alone. At all events, the roller should complete the job. A good dressing of bone dust—the Indian bone-meal—at the rate of, say, 100 lbs. to the acre, with 150 lbs. of sulphate of ammonia, will be a fair manuring for rape, if the land is not very poor; but, if it is regularly worn-out, we should add 50% to the quantity of bone-meal. If nitrate of soda be used, as a source of ammonia, it should be sown after the rape is in the 4th. leaf; unfortunately, this fertiliser is so dear now, that the price is almost prohibitory. The bone-meal and sulphate of ammonia may be harrowed in at the last turn of the harrows before sowing.

We do not agree with Mr. Shaw in one point; he says: "The sheep may feed upon it—the rape—at large." We prefer the hurdling off of a piece—say two day's supply—for two reasons: first, because when sheep are turned into a field at large they wander all over it and trample down a great deal of the crop before beginning to feed; and, secondly, because, when at liberty to do so, sheep have a disagreeable fashion of crowding into one or two favorite corners of a field by the side of the fences, &c., and thereby thwart one of the main objects of the system of feeding off crops *in situ*. That is, the equal distribution of their dung and urine all over the land. We know that the Lincolnshire (England) farmers turn their flocks loose into 50 acres of rape at once; but the waste of food by that proceeding is very great, as every one knows who has seen the half-eaten stems of the plant sticking up all through a piece of rape treated in this way. On our South of England hurdling system, a careful shepherd will leave no such waste behind him.

The Kent man sows rape seed, the Cambridgeshire man sows *colza*, or *cole* seed, and each swears by his own selection. We have grown both, and we never could see that one was more productive of meat than the other.

In feeding off any crop with sheep, the *pitch*—i. e., the hurdling off, should be so arranged that as soon as one part of the field is eaten off, the plough may, what we call, "follow the fold," so as to cover in the droppings of the sheep. For, the formation of ammonia, and its escape, proceed very rapidly in the sheep-fold, as the nose will impress upon any one who passes it in the early morning.

SAVING A CANADIAN FARM WITH TARES AND RAPE.

J. T., Ontario.—I have just acquired a run-down farm adjoining my own. Taking a 10 acre field at a time, would it, in addition to a good coating of stable manure, assist materially to get the land into rapid shape were I to pasture 100 sheep for six or eight weeks thereon, feeding them from racks spread over the field, or is there a better way of utilizing the sheep for the object sought?

Ans.—No quicker way, perhaps, could be taken of renovating this farm by the aid of sheep than the following: Upon the first 10 acres apply the barnyard manure in the spring, and plow it under. Sow an acre of tares or vetches as early as possible after plowing. Sow enough of oats along with the tares to support them, otherwise they may be injured by hugging the earth too closely. Two weeks hence sow another portion of the field of equal area. Repeat the same a third time and a fourth, if the spring should prove an early one. As soon as the tares of the first sowing have commenced to bloom, cut away a small space and inclose it with mova-

ble hurdles. Put movable racks in this inclosure, cut the tares and feed in the racks as required. Move the racks from time to time as occasion may call for it. In this way the crop that grew on all the area thus sown to tares will be returned to the soil in the form of excellent manure.

Cultivate the portion of the field not sown with tares after it has been plowed, as occasion may require until the middle of June. Secure a fine pulverization and sow the Dwarf Essex rape broadcast or in drills. If wanted for a cleaning crop it should be sown in drills and cultivated. As soon as the tares are all used, the rape crop will be ready to pasture. The sheep may feed upon it at large.

After the first lot of tares has been fed, the ground may be at once plowed and sown to rape in drills, and so with the second lot. When the sheep have eaten off the first sown rape, then they may eat the last sown. When the sheep are feeding upon the tares, they should be inclosed in the hurdles at night only and at each end of the day while the sun is not hot. They should be removed to a shady pasture daily when the sun waxes warm. When feeding upon the rape, they may remain upon it day and night, but it is all the better at the same time to have access to a grass paddock. Probably twice as much manure would be necessary on the part of the field first sown to rape, as the tares gather large quantities of nitrogen from the air. This the rape cannot do. A field thus treated should be in good condition for growing any ordinary crop that would follow. But this plan will apply only to soils that will grow rape well. The character of the soil is not given.

The process of enrichment with the next 10 acres would be further enhanced by commencing in August. The field might then be sowed to rye, and pastured by sheep in fall and spring until time to plow for the aforementioned crops. It would provide more even enrichment to devote one field entirely to growing tares and one to growing rape. The one which grew the tares could better do without barnyard manure than the other.

Great care should be exercised in securing the Dwarf Essex rape seed. Last year the major portion of the rape seed sown on this continent was not true to name. To protect our farmers in this neighborhood as far as we can, we are testing the stock of seed laid in by our Guelph seedsmen. The spurious kind sown last year blossomed in two months after the seed was sown, whereas the Dwarf Essex does not blossom the same season. Nearly all writers who referred to it called it the "Bird Seed" variety, which is a mistake. It was a larger kind, but its feeding value was not nearly equal to that of the Dwarf Essex.

Ontario Ag'l Exp. Station.
[PROF.] THOS. SHAW.

Tree-Culture & Horticulture.

The encouragement of Fruit-growing

CIRCULAR ADDRESSED TO M.M. THE
MEMBERS OF THE LEGISLATURE.

Department of Agriculture and
Colonisation.

Quebec, February, 1893.

SIR,

It is the intention of the Department to encourage as much as possible the cultivation of fruit-trees in the province.

Sir Charles Tupper, the High Commissioner of Canada, in London, has invited the attention of Canadians to the importance of the imports of apples and other fruits into England; and at the same time he attracts our notice to the fact that if we want to sell our apples in that country, we must make up our minds to grow the best sorts and those that are suited to the English market. Our exports of apples have already attained a pretty high figure, as last year we exported \$1,389,714.00 worth. In his report the High Commissioner mentions the industry of canned fruits, saying that we already supply England with part of her consumption of these, and incites us to develop this trade still more, as he believes it would be highly remunerative to many of our farmers.

The cultivation of fruit, in fact, has become a source of pretty considerable revenues to many inhabitants of this province, and convinced as I am that I ought to aid the development of this branch of Agriculture, I desire to diffuse a taste for fruit-tree planting.

I conferred with the nurserymen this autumn, and told them that I should need a certain number of fruit-trees for planting next spring. These trees will be assorted, and will comprise at least 20 specimens, the nurseryman will either go himself to set them out, or send an efficient substitute.

The trees will be delivered gratis at the house, but in only one place in your county, which place, as well as the name of the person who will undertake the care of the plantation, I beg you to state to the Department. It would be better that they should be all planted on the same property, in as central a spot as possible, and entrusted to one who understands their care; and that person must, from time to time, report on the growth of the trees and on the results produced. Instructions will be given him about the management of the trees. He must acquaint us beforehand with the nature of the soil on which the plantation is to be made.

I may be able to increase the number of the trees, but will depend upon my resources, and upon what I can get from the Ottawa experiment-farm. At any rate, I can ensure there not being fewer than 20 trees, including apple trees, plum-trees, &c.

I have the honour to be, Sir,
Your obedient servant,

LOUIS BEAUBIEN,
Commissioner of Agriculture and
Colonisation.

(From the French.)

Manures.

A correspondent asks several questions about the proper way to use "phosphates" (see p. 95). Of course he means fertilisers in general. We will reply to his inquiries with pleasure.

And first, we divide the "chemical manures," as our friends in France call all fertilisers, into three classes: 1. those containing phosphoric acid, like bone-meal, superphosphate, Carolina-rock, basic-slag, &c.; 2. those containing nitrogen, as nitrate of soda; sulphate of ammonia, &c.; 3. those containing potash, as wood-ash, kaint &c.

In the second place, the question arises, to what kind of crops are we going to apply the fertilisers? The usual crops grown on the farm are of four kinds: grain crops, roots and other hoed-crops, grasses, including the clo-

vers, and green-meats, including maize or Indian corn.

FOR GRAIN CROPS.—The usual dressing for these is superphosphate and either nitrate of soda or sulphate of ammonia. The superphosphate and sulphate of ammonia may be mixed and sown broadcast before sowing the grain, and covered by the harrows; or they may be broadcast after the grain is up. We prefer the former plan.

The nitrate of soda, a far more soluble fertiliser than the sulphate of ammonia, should never be sown before the grain is well above ground; the better plan is, in early seasons, to sow it at twice, with an interval of ten days between the sowings. In this case the superphosphate should be sown as above and covered with the harrows. 250 lbs. of superphosphate and 100 lbs. of nitrate of soda, or 80 lbs. of sulphate of ammonia, will be sufficient on fairly well farmed land.

ROOTS AND OTHER HOED-CROPS.—These may be divided into turnips and swedes, mangels and sugar-beets, carrots, parsnips, and potatoes, with maize for ripening.

Turnips and swedes demand phosphoric acid, in the forms we saw above; as these and mangels are, here at least invariably sown on the drill with at least some portion of farmyard-dung, the best way of using the fertilisers is to sow them with the manure drill, after the drills have been split over the dung. One great object of using the highly soluble superphosphate of lime for these two plants is to push them out of the fly's way as soon as possible; and as the manure-drill sows the fertiliser and then interposes a shallow layer of earth between it and the seed, before the latter falls from the seed-conter, it is clearly as nearly perfect as can be. But, in the absence of this implement, to get the seed and manure into as close juxtaposition as possible, we have practised the following plan: a single horse is yoked to a rather stout pole about 8 feet long, which is drawn along over the drills after the dung is spread and the artificials sown across the drills; the drills are then split, rolled, and the seed sown with the ordinary seed-barrow. With a fair allowance of farmyard-dung, 300 lbs. of superphosphate (containing 15 o/o of phosphoric acid, which is always the quality we speak of here and elsewhere) should be sufficient for an acre. An addition of 80 or 100 lbs. of nitrate of soda or sulphate of ammonia may possibly increase the crop, but at the expense of quality in the case of white turnips; which are none the better for being large.

Mangels persistently ask for nitrogen. An experience of more than forty years induces us to say that no man who aims at a really full crop of mangels should fail to use nitrogenous manures at the rate of 40 lbs of nitrogen to the acre. This would require about 200 lbs. of sulphate of ammonia or 220 lbs. of nitrate of soda. The sulphate of ammonia should be sown as recommended for sowing the superphosphate on the drills for turnips and swedes; but the nitrate of soda should be scattered over the young plants immediately after the first hand hoeing or singling. The dose of fertilisers mentioned of course is in addition to the usual dose of dung.

SUGAR-BEETS.—We never grow any, but from all the practical men engaged in growing beets for the factories, we hear the same story: to get the best quality of roots for sugar, no farmyard dung should be used immediately for this crop, but that the previous crop should be heavily manured, and a dressing of the following mixture applied for the beet-crop:

200 lbs. of sulphate of ammonia;
400 lbs. of superphosphate;
160 lbs. of nitrate of soda;
100 lbs. of sulphate of potash, or 200
lbs. of kainit;
300 lbs. of land-plaster.

The sugar-beet, in Europe, is almost invariably drilled in on the flat, so the manures should be harrowed in just before drilling, except the nitrate of soda, which, as usual, should be sown on the plants after the first hoeing.

As we never found potash do any good in this country for any crop—not even for potatoes—we do not care to recommend its use. The sulphate of lime, or as it is called here, land-plaster, is always used abroad in the calcined state, which renders it much more soluble.

Carrots and parsnips, as far as our experience goes, seem to have no special desire for any artificial manures; at least, we have never found any one who had used them for these crops. Good seed, well soaked and just sprouted, good preparation of the land, and careful singling; if these points are attended to, and a fair dressing of dung applied, the yield is generally satisfactory.

Maize, like grain-crops in general, requires nitrogen and phosphoric acid. Three cwt. of superphosphate and 100 lbs. of sulphate of ammonia or 130 lbs. of nitrate of soda, added to a heavy dressing of dung, will, with good cultivation and plenty of hoeing, seldom fail to produce a crop—in favourable season. Harrow in the sulphate of ammonia, and sow the nitrate of soda, along the rows of corn when it is about 6 inches high.

POTATOES.—Some deny that nitrogen is beneficial to potatoes, but the universal use of it in England and Scotland contradicts their assertion. Potash, on light soils long under the plough, but seldom visited by the dung-cart, may possibly be of use to this plant; in which case, it, in the form of kainit, at the rate of 400 lbs. to the acre, or wood ashes, at the rate of 30 bushels of hard-wood-ash, should be spread either in the fall, in places where there is no fear of their being washed away by the spring-thaws, or at the very earliest opportunity in the spring. Potash, in every form, is very refractory: it will not readily become soluble; but the phosphoric acid contained in wood-ash must always be useful. Besides dung in abundance, 200 lbs. of sulphate of ammonia or its equivalent of nitrate of soda, will not be wasted on this greedy feeder.

GREEN-MEAT CROPS.—Hungarian grass and silago-corn, are consumed in the immature state. What is wanted for luxuriant production of such is a good supply of nitrogen; so 100 lbs. of sulphate of ammonia or 130 lbs. of nitrate of soda, used as above, will do for them. If the corn is to nearly ripen before cutting, 200 lbs. of superphosphate may be added.

The finest crop of vetches or tares we ever grew was treated to 3 cwt. (gross) of the best Peruvian guano; this was in 1-52, when guano contained 14 o/o of nitrogen, beside some 5 o/o of potash and 25 o/o of phosphoric acid. The crop was, before it went down, about 3½ feet high, and the small piece of it that was required for the daily supply of 11 horses, 25 head of cattle, and a lot of pigs, was curious to see. The moderns, Villo and others, will not hear of nitrogen being demanded by this crop. Well, brazen-faced boldness as it may seem to be, we prefer our own experience to their theory, and we should apply to an acre of tares, to be cut in bloom, 200 lbs. of sulphate ammonia, or 260

lbs. of nitrate of soda, and 336 lbs. of superphosphate. If wood-ashes are plentiful, 30 bushels of them might replace 136 lbs. of the superphosphate.

Grasses, like grain-crops, which are really grasses too, require nitrogen in moderate dose, but as they are almost invariably accompanied by the clovers, particularly in permanent pastures, &c., and as the luxuriant growth of the grasses is inimical to the growth of clover, it would be better, as a general rule, to add to the dose of nitrogen a good allowance of phosphoric acid, with, on light land not too frequently visited by the dung-cart, a few bushels of wood-ashes.

A good recipe for a mixture of these for ordinary land would be: 200 lbs. of superphosphate, 80 lbs. of nitrate of soda, and 10 or 15 bushels of hard-wood ash.

On heavy loams—there are no heavy clays to an Englishman's eye on this continent,—basic slag may be substituted in part for superphosphate in the root-crop division, at the rate of $\frac{1}{3}$ of basic slag to $\frac{2}{3}$ of superphosphate. Bone meal and superphosphate may be mixed at the same rate on light land when the meal is really meal; even $\frac{1}{2}$ inch bones take some time to become soluble in heavy soils, on which it is better to use nothing but superphosphate.

Lastly; clovers love phosphoric acid, potash, and lime, therefore, dress them with superphosphate, kainit, and land-plaster. As clover is at least a biennial, or we make it so by sowing it in a grain-crop, potash may have time to exert its influence on this plant: 200 lbs. of superphosphate, 300 lbs. of kainit, and 300 pounds of land-plaster, as a top dressing after the grain is carried, say in September, will be a fair application.

In England, artificials are rarely used alone for the root-crop, but a dressing is given of half a full coat of farmyard manure and half a dose of artificials. The remaining half of the dung is put on the young clover, as soon as the press of fall-wheat sowing is over. Clover, there, only stands one year; it is mown, almost invariably, for hay twice, though sometimes the second-crop is folded off by sheep. In both cases, the following crop of wheat is the best in quality, as well as the greatest in yield, of any grown on the same farm, *ceteris paribus*. When artificials alone are used as manure for turnips, swedes, tares and rape, the crop is invariably fed off by sheep, with an addition of cake, grain, or pulse (pease or beans), given in troughs. The troughs are moved daily, for two reasons: first, to prevent the sheep-manure being deposited too much in the same place, and, secondly, to prevent the same spot from being too much trampled down by the sheep's feet. Sheep always like to lie as near the troughs as they can get: to be on the look-out for cake or corn is part of their nature.

Pease, beans, and all other pod-bearing plants, take the same manure as clover.

The Bee-Master.

PROFITS OF AN APIARY.

You ask me, for the benefit of the readers of the *Journal of Agriculture*, to send you some information on the possibilities of apiculture in this province: this I will do with great pleasure. I will also briefly describe to you what can be done by a study of the improved methods of apiculture,

including the moveable-frame-hives and the way to manage them.

I am so thoroughly convinced of the superiority of these plans over the old ones, that I am certain that if they were better known to all those who have already a few hives, the fixed-comb hives would be nowhere tolerated, for, with the frame-hive, the harvest is no longer a matter of chance; everything is, so to say, in the hands of the bee-master; he can make use of his apiary either for its yield of honey alone, or for promoting his colonies; or for both purposes. The Queens which are imperfect can be replaced by young Queens; a most important point, the natural increase, that is, the swarming, can be almost entirely suppressed, so that the whole stock of a colony can be retained in the same hive, and this makes rich hive yields, of from 100 lbs. to 150 lbs. of honey each, and we have even seen some of 200 lbs. Doubtless, such yields are not to be seen every year, nor in every place, but I know of some districts in this province where even these have been surpassed.

Here I can fancy how the eyes of some of your readers will open; but I must tell them that if they will take the pains to study modern methods earnestly, I can promise that they will be surprised by the yields obtained even in some places that are not thought suitable to bee-keeping. How many young people could get together a few dollars by keeping two or three colonies of bees, without the sacrifice of more than a few minutes daily? Of this I speak with certitude, for I began in this way. I should be glad to incite others to do the same, knowing beforehand, that, like me, they will be deeply interested in the wonders of the interior of a bee hive, as well as by its admirable management, a thing so easily to be inspected by the moveable frame-hive.

Well, for the encouragement of those who wish to perfect themselves in the art, I think I ought to inform the readers of the *Journal* that, at the request of its patriotic Director, Mr. Barnard, I intend, with the assistance of some other persons of experience in this art, to write a short series of articles on the best way to deal with bees in the various seasons of the year, articles that will be based on an experience of years, of practice and study, and having the advantage of being fully up to the knowledge of the day. Lastly, I think I ought to add that few things are more profitable than well managed apiculture, and that as long as my bees give me 50 lbs. of honey per hive more than they want themselves, I shall continue to make them my chief care, and to increase my 150 colonies as much as circumstances will permit.

J. H. BLAIS.

Ste-Foy, 24th December, 1892.

(From the French.)

(To be continued.)

GENERAL CONSIDERATION ON APICULTURE.

The management of bees is, nowadays, universally considered as one of the most profitable branches of farming. It has engaged the attention of intelligent people of every age, and, still, it is only recently that, thanks to the improved moveable frame-hives, to the honey-extractor, and to the false combs (*cire gaufrée*) that this art ceasing to be an affair of chance, has become as certain as, and more remunerative than, any other rural occupation, provided a moderate amount of

capital be invested in its prosecution.

Much has been written on the enormous profits to be derived from apiculture, and the result is, that many persons have bought hives, and then, after having kept them some years without much attention being paid to them, have abandoned the pursuit because they were ignorant of the first principles of the business.

Although any one can keep bees, it is not given to every one to be a perfect bee-master.

Only energy and perseverance, coupled with powers of observation, can ensure real success in this work. While a certain degree of aptitude is necessary in this as in every other pursuit, men of ordinary capacity, applying themselves to it as to a special study, will be more likely to succeed than those who, though possessed of exceptionally fine endowments, expend them in a dozen different occupations. He who thoroughly understands his business, appreciates its needs, he has made himself master of all its details, and he who is industrious and endowed with energy has every chance of succeeding, and if he, in addition, possesses the aptitudes for practical work, his success may exceed the average.

Such a person will quickly master all the theory connected with the art.

FRAME HIVES. — Apiculture has made great progress during the last 20 years. The old straw hive of the past, as well as its accompanying ignorance and superstition, are rapidly vanishing, and since the introduction of the moveable frames, bee-keeping has begun to be regarded with a more favourable eye, and has attracted much more attention. Nowadays, these frames are considered as indispensable, if bee-keeping is to be profitable, for it is only by their aid that the bees are kept under complete control by their master.

HONEY-EXTRACTOR — Next in importance is the honey-extractor, a precious invention, the use of which, to the great advantage of the bee-master, increases considerably the yield of honey by saving a good deal of the bees' exertions.

Thanks to this implement, we get honey of better quality free from all mixture of pollen or young-brood (*couron*), and that can be sold much cheaper than the honey strained from the combs of the old straw-hives.

FALSE-COMBS. — We have, lastly, the modern false comb, another most useful invention, and as indispensable in making bee-keeping profitable as the other two.

By their use, we save the bees half their labour, at least, and use up the old wax, beside making the combs very correct in form, and getting rid of drone-cells, when they are no longer wanted.

THE HIVE.

Before starting as a bee-master, it is necessary to decide upon the kind of hive one intends to use. This is a matter of great importance, and it frequently happens that, in making his selection, the bee-master, is puzzled. A mistake at starting may be the cause of much trouble and annoyance. For bees will work in any kind of hive, so to speak, but they will do their best in one that we arrange gradually to suit their requirements according to the seasons.

The chief aim of bee-keeping being to get a surplus of honey, the hive should be suited to that purpose, and if the owner studies the manners and

instincts of the bees, he can manage and direct their proceedings by adopting the hive and treatment that correspond with their natural demands.

Movable frames are indispensable for the management of bees in an intelligent manner, and when properly employed, enable us to have complete control over them. It is easy to change the frames and the bees from one hive to another, and they can be examined in ten minutes. Weak colonies can be strengthened by exchanging empty frames for brood-frames taken from strong ones; artificial swarms can be provided in all sorts of ways; queens can be reared; swarming may perhaps be in great measure prevented by the addition of space for the brood, and the destruction of queen-cells, or by the insertion of frames of fluted sheets which the bees will transform into combs.

Movable frames, too, will allow the bee-master to prevent the building of drone combs, or to diminish their number, by the insertion of fluted wax for workers' combs; and equally enable the master to have as many drones as he pleases by inserting drone-combs.

If a colony should become orphaned, or if the queen takes to *humming*—i. e., only lays drone eggs—, an examination will reveal the fact, and another queen can be introduced. If the brood-nest becomes filled with honey, the frames can be removed and the honey extracted. Now, this often saves the life of a colony: for, in a period of activity, mortality among the bees is so great, that unless they rear young ones in great numbers, the population of the hive decreases rapidly, and this happens when the queen has no place in which to lay her eggs. Still, moveable frames are only useful on condition of their being adapted to the natural instincts of the bees.

If we examine a hive, we find that the comb of the workers is about $\frac{3}{4}$ of an inch to an inch thick. We, therefore, make our frames $\frac{3}{4}$ of an inch wide. The passages between the covered combs of the brood are sometimes only $\frac{1}{2}$ of an inch. In practice, we find that if the frames are made so as to leave a good quarter-inch round the sides, the bees will leave that space open. If the space is sensibly narrower, they will fill it up with *propolis*; and if it is sensibly wider, they will fill it up with wax and honey. Below, a space of $\frac{1}{8}$ of an inch may be left.

By making the frames $\frac{3}{4}$ an inch shorter than the interior of the hive, a $\frac{1}{4}$ inch passage will be left on each side which the bees will respect. If the frames are $\frac{3}{4}$ inch wide (the thickness), they may be placed $\frac{5}{8}$ inch apart, which will give $1\frac{1}{2}$ inch from centre to centre, although this separation is indispensable; and if we wish to confine the bees to the sole production of working-bees-brood, the frames may be put as close as only $1\frac{1}{2}$ inch from centre to centre.

The exterior dimension of all the frames and the interior dimensions of all the hives must be uniform. Very great exactitude in their manufacture is most important, for if each frame is not so constructed as to fit any or every hive, we shall not realise the full advantages of the system of moveable combs, and many inconveniences and difficulties will beset us.

C. PÉLOUQUIN,

Apiculturist,

St. Hyacinthe.

(From the French.)

(To be continued.)

A WELL FAMED HOUSE

Amongst the principal commercial firms engaged in the sale of musical instruments, Mr. L. E. N. Pratto, 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. Pratto has soon won 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 comprise 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. Pratto 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. Pratto's store to be made acquainted with his prices and conditions of sale which are most liberal. Mr. Pratto sends also, on application splendid illustrated catalogues.

THE GARDEN OF CANADA

A Glance at the Fruit Section of Ontario.—A Land of Wealth and Beauty.—Over seven hundred acres of Nursery.—Stock, Fields of Fragrant Roses.

A GREAT CANADIAN INDUSTRY.—THE LARGEST OF ITS KIND IN CANADA.

When a business firm becomes an aspirant for public favor and confidence, particularly in the Nursery Business, the first question naturally asked is "What assurance or guarantee can you give that you are sufficiently responsible and reliable, so that the confidence we may repose in you will not be abused?"

The best answer to this question is the testimony of the general public who have had dealings within the past years, and to the fact that our business has steadily increased, each year, to such an extent that we have been obliged to enlarge our borders to keep pace with the demands for stock made by us, and to meet the great and increasing demand from all parts of Canada and the United States for hardy stock, and here we may remark that our increased trade from these points, especially in the colder sections of the province of Quebec and all of the States north of Maryland and Kentucky, has shown that our efforts to introduce hardy fruits, adapted to the climate they are sent to, are appreciated.

Seven hundred acres are said to contain more Nursery stock than all other Nurseries in Canada combined. Over 1,000,000 apple, 150,000 pear, 100,000 plum, 75,000 cherry, 100,000 peaches, 50,000 roses, 100,000 grapes, 200,000 currant and gooseberry, 150,000 raspberry and blackberries, besides thousands of ornamental trees, shrubs and evergreens, &c., &c., are in stock. This simply means that the farmers of Canada can increase their orchards to the extent of 4,500 acres each year from this one source alone.

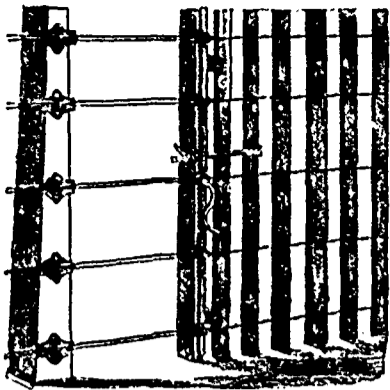
A specialty is made of growing new and hardy apples, pears, plums and cherries, suitable for the northeast and northern counties of Ontario, Quebec, the Maritime Provinces, also the northern and north-western States.

From our different offices we employ from 200 to 300 Canvassers.

Never were our facilities so great for giving customers good stock and general satisfaction, and it is with the utmost assurance that we solicit a continuance of public confidence and patronage.

Respectfully,

J. W. BEALL, Stone & Wellington, Manager Montreal Office, Temple Building.



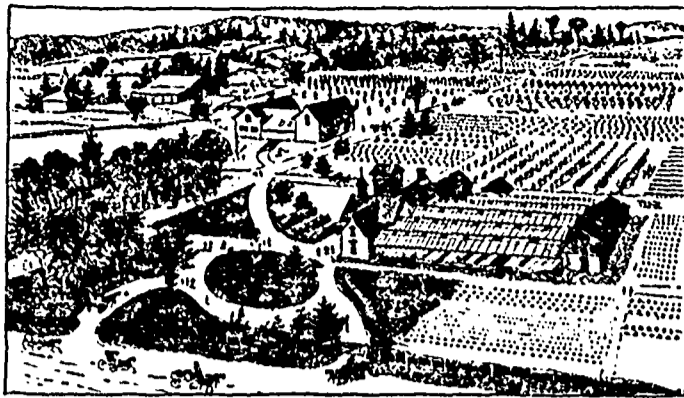
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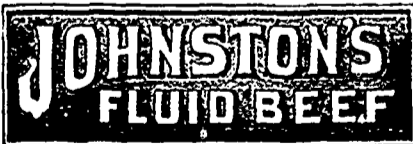
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We guarantee our press to work at the rate of 10 to 13 tons of hay every day without the horses being tired.

We manufacture four sizes of presses:

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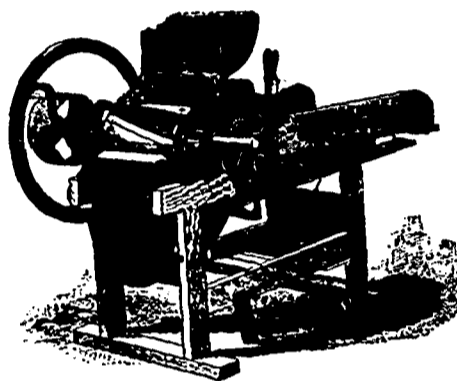
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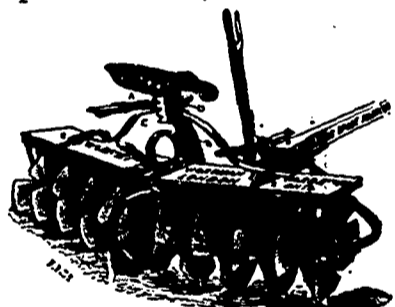
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Montreal.



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.

Some of the Economies realised by our Association during the last week of April.

SEEDS.—Rev. E. Poirier, Agricultural Missionary, St. George de Beauce, \$141.05. Profits, \$24.
Rev. E. L. Chouinard, Priest, St. Moïse de Matane, \$34.94. Profits, \$7.06.
J. Labelle, St. Jacques de l'Épiphanie, \$281.26. Profits, \$46.
Dr. Grignon, St. Adèle de Terrebonne, \$386.60. Profits, \$59.25.

F. X. O. Lacasse, Notary, St. Elizabeth de Joliette, \$144.46. Profits, \$27.76.

CHEMICAL MANURES.—Anselme Lecavaller, St. Dorothée de Laval, 12 tons of superphosphates.
Louis Labelle, St. Jerome, 14 tons diverse manures.

The Haras National Company

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

NORMAN, PERCHERON, BRETON AND CLYDESDALE STALLIONS

PROFITABLE TERMS.—SALE OR RENT.

45 Prizes and Diplomas for 1891 and 1892 in the Provinces of Quebec, Ontario and Manitoba.

Stables at Outremont, near Montreal.

Offices: 30 St. James St., Montréal.

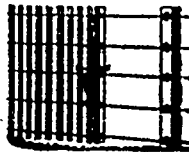
Season of 1892 : Number of services :

Napierville : 70.—Gaspé : 107.—Missisquoi : 79.—Vaudrouil : 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 Franco 54 %
Percentage of colts, 1892, Haras of Germany 53.30 %

AUZIAS-TURENNE,
Man. Director.

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. Liberal Terms to Agents. **CATALOGUE FREE.** Address the manufacturer.

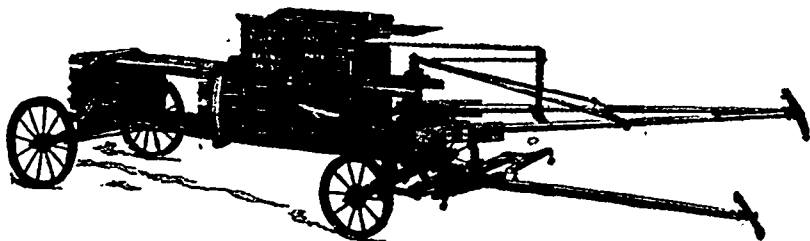
S. H. GARRETT, MANSFIELD, O., U. S. A.

The Huntingdon Agricultural Implement Works

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

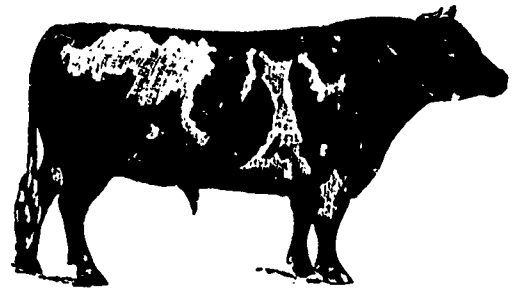
P. K. DEDERICK'S PATENT HAY PRESSES,

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.

BOYD & CO.,
Proprietors, Huntingdon, Que.



BEAUBIEN FARM

OUTREMONT : MONTREAL

Montreal Exhibition 1891-92

25 PRIZES.

TO SOCIETIES OF AGRICULTURE AND FARMERS DESIROUS TO IMPROVE THEIR STOCK.

WE OFFER PURE BRED REGISTERED

AYRSHIRE CATTLE

BULLS, COWS, CALVES, ALL CHOICE STOCK.

PURE BRED REGISTERED

Berkshire and Improved Chester White

The Chester White is known to be invulnerable to pigs' cholera.

PURE BRED PLYMOUTH ROCK—Improved breed

COCKS, HENS, CHICKENS, EGG.

HOT-BED PLANTS OF ALL KINDS SHIPPED TO ORDER BY

EXPRESS, C. O. D.

Apply to **JOSEPH BEAUBIEN,**
30 St. James, Montreal.

Do you cough? Are you troubled with Bronchitis, Hoarseness, Loss of Voice, etc.?

Read what the



SAY

And you will know what you should use to cure yourself.

"I certify that I have prescribed the PECTORAL BALSAMIC ELIXIR for affections of the throat and lungs and that I am perfectly satisfied with its use. I recommend it therefore cordially to Physicians for diseases of the respiratory organs."

V. J. E. BROUILLET, M. D., V. C. M.
Kamouraska, June 10th 1885.

"I can recommend PECTORAL BALSAMIC ELIXIR, the composition of which has been made known to me, as an excellent remedy for Pulmonary Catarrh, Bronchitis or Colds with no fever."

L. J. V. CLAIRROUX, M. D.
Montreal, March 27th 1889.

L. ROBITAILLE, Esq. Chemist.
Sir,

"Having been made acquainted with the composition of PECTORAL BALSAMIC ELIXIR, I think it my duty to recommend it as an

"excellent remedy for Lung Affections in general."

N. FAFARD, M. D.
Prof. of chemistry at Laval University.
Montreal, March 27th 1889.

"I have used your ELIXIR and find it excellent for BRONCHIAL DISEASES. I intend employing it in my practice in preference to all other preparations, because it always gives perfect satisfaction."

DR. J. ETHIER.
L'Epiphanie, February 8th 1889.

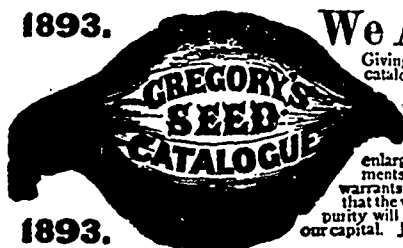
"I have used with success the PECTORAL BALSAMIC ELIXIR in the different cases for which it is recommended and it is with pleasure that I recommend it to the public."

Z. LAROCHE, M. D.
Montreal, March 27th 1889.

Lack of space obliges us to omit several other flattering testimonials from well known physicians.

For sale everywhere in 25 and 50 cts. bottles.

1893.



1893.

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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 peculiarly 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.