

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

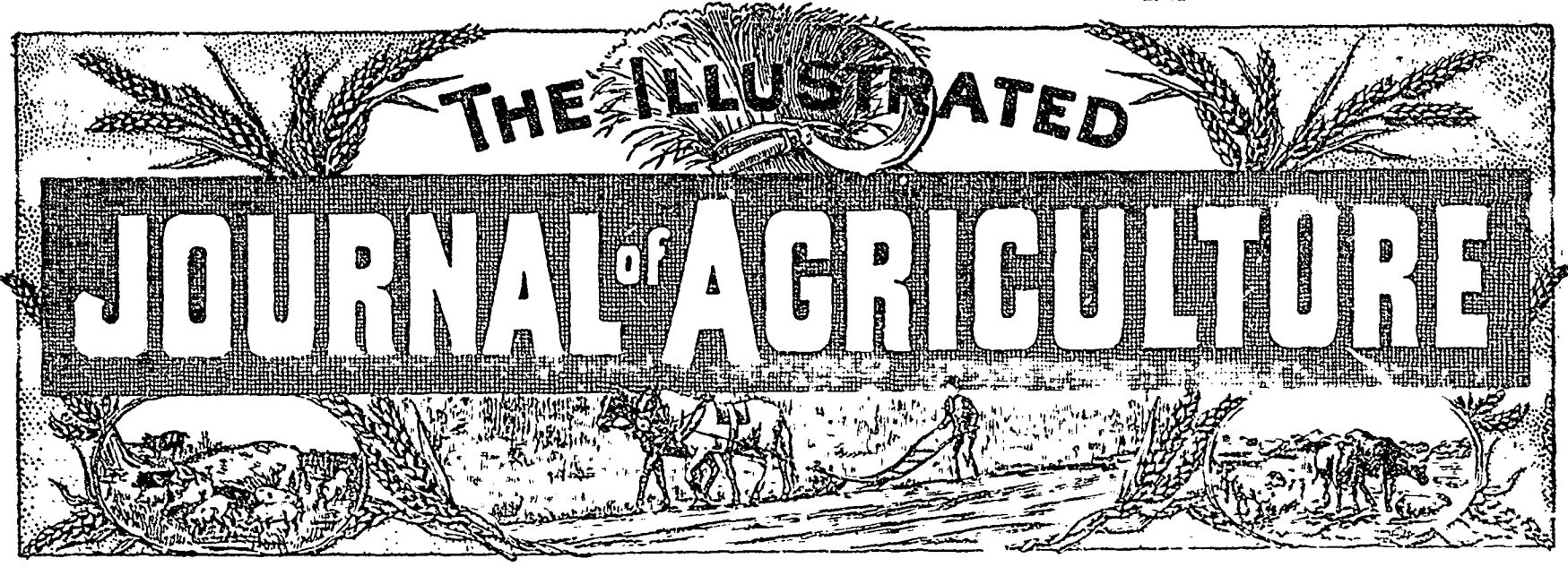
- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion
along interior margin/
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear
within the text. Whenever possible, these have
been omitted from filming/
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
 - Pages damaged/
Pages endommagées
 - Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
 - Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
 - Pages detached/
Pages détachées
 - Showthrough/
Transparence
 - Quality of print varies/
Qualité inégale de l'impression
 - Continuous pagination/
Pagination continue
 - Includes index(es)/
Comprend un (des) index
- Title on header taken from:/
Le titre de l'en-tête provient:
- Title page of issue/
Page de titre de la livraison
 - Caption of issue/
Titre de départ de la livraison
 - Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

THE ILLUSTRATED JOURNAL of AGRICULTURE



Vol. 18, No. 11.

MONTREAL, MAY 1, 1897.

\$1.00 per annum, in advance


FRASER'S
Horse & Carriage
Depository,
131 to 137 Inspector St.,
Corner St. James.
Auction Sale every Tuesday
at 2.30. Private Sales every
day. Stabling for 75 horses. Consignments solicited.



HISLOP & HUNTER...
Produce Commission Merchants,
235 to 239 Commissioners St.,
Montreal, P. Q.
Highest price paid for fresh Creamery Butter.

ST. ARNAUD & CLEMENT,
Butter, Cheese and Provision
Merchants.
Received on consignment, or bought at highest
Market Prices.
ALWAYS ON HAND CHEESE FACTORY AND
CREAMERY SUPPLIES
2 and 4 Foundling St., Montreal.

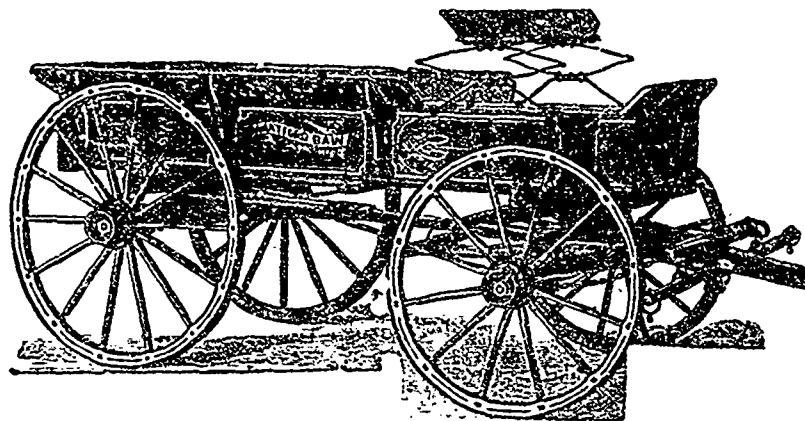
Horse Owners! Use
GOMBAULT'S
**Caustic
Balsam**
A Safe Speedy and Positive Cure
The Safest, Best BLISTER ever used Takes
the place of all liniments in mild or severe action.
Removes Bunches or Blemishes from Horses
and Cattle. SUPERSEDES ALL CAUTERY
OR FIRING. Impossible to produce scum or blisters.
Every bottle sold is warranted to give satisfaction.
Price \$1.50 per bottle. Sold by druggists, or
sent by express, charges paid, with full directions
for its use. Send for descriptive circulars.
THE LAWRENCE WILLIAMS CO., Cleveland O.



FOR SALE
REGISTERED CANADIAN CATTLE
One cow 7 years old, she gave 1877 lbs. of milk in
two months. One Bull 5 years old, 3rd prize at Mont-
real; 3 one year old Bulls, a few yearling calves. A
Jersey-Canadian cow, 6 years old, richness of her
milk S. & N. Nov. 1896. Address to
Rev. J. N. CHARRONNEAU,
Ste-Hélène, Bagot County, Que.

LUMP ROCK SALT
Do you give your Live-
Stock sufficient Salt?
VERRET, STEWART & CO.,
Salt Dealers, Montreal.

MASSEY-HARRIS CO., LTD, 640 ST. PAUL STREET, MONTREAL.



The Best is none too good.
Get BAIN WAGON and
VERITY CULTIVATOR and
you will be suited



MASSEY-HARRIS CO., LTD., 640 ST. PAUL STREET, MONTREAL.

GOOD ROADS

We Manufacture complete outfits of the most
modern improvements in

ROAD MAKING MACHINERY & C.,

And shall be pleased to correspond with Municipalities,
Associations, &c.

THE SAWYER MASSEY CO., LTD.,

HAMILTON, ONT.

GILT-EDGED BUTTER

for Users of

The
Davis
Cream
Separator
for
Farm Use.




Send for a Hand-
some Catalogue.

The John Abell Eng. & Mach. Works Co. (Ltd.),
Toronto, Ontario.

Special April Sale at Lealeigh Grange Farm,

J. N. Greenshields, Prop.
Six very choice Ayshire
bulls, fit for service 1 and 2
year old Brod from the deep-
est milking strains in Canada.
Also booking orders for
choice Yorkshire pigs, at very
low prices; send in your or-
ders at once to
T. D. McCallum, Mgr.,
Danville, Que.



GORDON'S SCALES

We are selling Farmers'
Scales

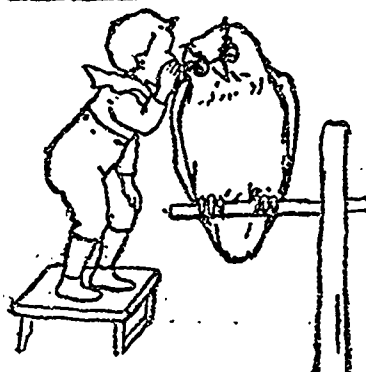
5 lbs. Butter Scales	\$2.75
10 " " "	3.50
20 " Union	5.00
50 " Iron Platform Scales	8.50
500 " Wood	10.50
600 " Double beam	14.00

Larger sizes at proportionately low Prices. These
Scales are made of first class Materials. Cash must
accompany all orders.

W. GORDON & CO.,
11 587 St. Paul St., Montreal.

AYRSHIRES.—A few choice Young Bulls for
sale also Shetland Ponies.
ROBERT NESS,
Importer and Breeder,
Woodside Farm, Howick, Que.

For Sale.—Ayrshire Cattle, 2 Bulls two years old, 3
one year old. Yorkshire Pigs and Cotswold Sheep.
Very low prices. Complete satisfaction guaranteed.
ELIE GIROUARD,
Ste-Victoire, Richelieu County, Que.

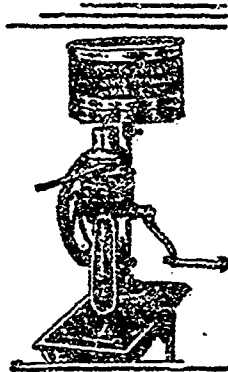


Whisper—There is only one Farmers' Binder
Twine Co. in Canada, headquarters, Brantford.
They make

"RED STAR" and "BLUE STAR"

twine. Don't make any mistake in the brands.
Their business is all done through farmer agents
and their own stockholders. Do your duty by
this the Farmers' Company, order out early, pay
them promptly and you will not only get the best
twine for many years to come at fair prices but
you will have agricultural implements of all
classes from American patterns, supplied you in
the near future at about half what you are
paying to-day.

Hon. Thomas Ballantyne, Joseph Stratford,
PRESIDENT. GENERAL MANAGERS.



Have You Seen

THE AMERICAN CREAM SEPARATOR

The most simple, durable, and easiest cleaned machine on the market.
It is the latest and most improved Separator, being patented in Canada on
February 26th, 1896.
It has but one piece to the bowl, and for capacity and quality of work is the
best and cheapest machine on the market. Any prospective purchaser
may try one.

Agents Wanted in all Unoccupied Territory.
We still lead in the manufacture of all kinds of Cheese Factory and Creamery goods.
Our Patented Steel Gang Cheese Press
Continues to be the best, and every user gives it his best recommendation.
If you require anything in our line we collect your correspondence,
and know that we can satisfy you in anything and everything, both
in price and quality of goods.

Make all your enquiries
and send for Catalogue to
Richardson & Webster,
ST. MARYS ONT.

Great Reduction in Prices for Cash Only

TO THE OWNERS AND PATRONS OF CHEESE AND BUTTER FACTORIES
ON THE FOLLOWING ARTICLES, VIZ.:

GLASSWARE, all kinds, 20% discount on prices in catalogue pages 7 and 8.
NEW JONES' Patented Cheese Hoops, 15 in. dia., complete with follower and press ring \$2.75.
THE WELL KNOWN "EMPIRE STATE" milk cans used by patrons:
Capacity 15 gallons..... \$2.90
do. 20 do. 3.10
do. 25 do. 3.60
do. 30 do. 4.10
CHEESE BOX HEADINGS, 15 and 16 in. per 1000 sets \$28.00
do. 16 and 17 in. " " 30.00
SCALEBOARDS, American, per bundle, \$1.60.
Seamed, Seamless and other kinds of Cheese Cotton at lowest market prices.

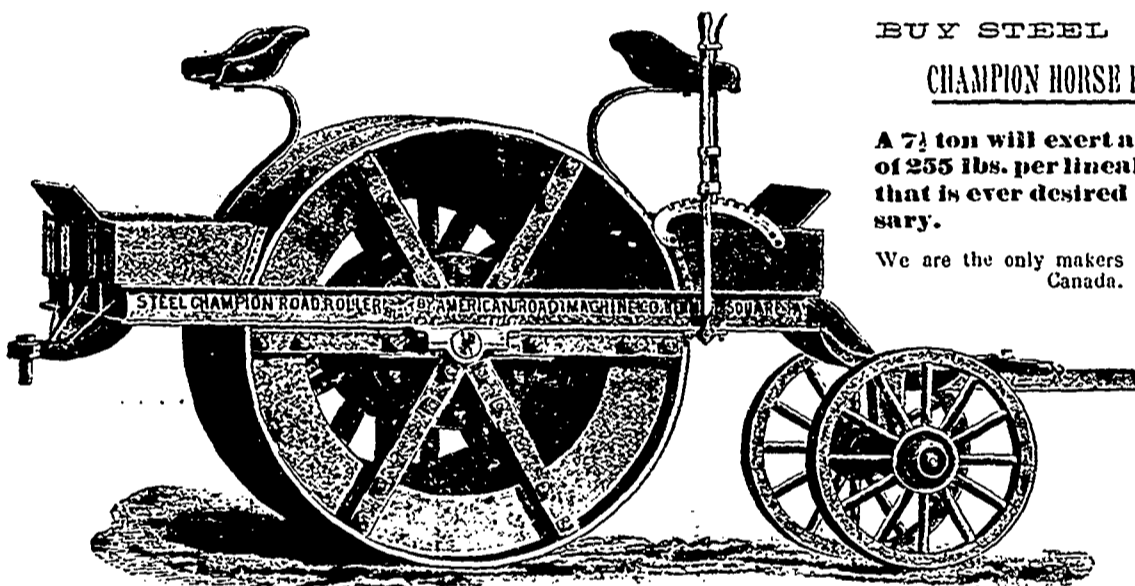
FAUCETS 20% discount.
BABCOCK milk testers, 8 bottles, complete..... \$ 9.00
do do 12 do do 11.50
do do 16 do do 12.50
do do 24 do do 17.00
do do 30 do do 22.00
RENNET EXTRACT, "B d'or" or "Silver Star"
By 30 gall. per gall. \$1.15 imp. measure or \$0.96 wine measure
20 do do 1.20 do do 1.00 do
15 do do 1.20 do do 1.00 do
10 do do 1.25 do do 1.05 do
5 do do 1.30 do do 1.10 do
CHEESE Coloring "B d'or"
Imperial gallon..... \$1.50
Wine do 1.25
Imperial do 2.50
Wine do 2.10
BUTTER do do.

PRESERVATIVE "M" for milk and cream, per lb..... 0.33
do "B. B." for milk used in butter and cheese making 0.26
do "E" for eggs, per lb..... 0.23
CHURNS "Favonite" { No. 2, capacity 15 gallons..... 3.50
No. 3, do. 20 do. 3.75
No. 4, do. 25 do. 4.50
Milk books, pass books and other kinds of Stationery at very low prices.
If you have not received my illustrated catalogue and price list for 1897, drop me a postal card and I will mail a copy to your address.

Notice to Country Merchants
I am prepared to receive all kinds of country produce on commission, and sell them for your account in the shortest possible delay. I can always obtain the highest market prices for your goods and send prompt and satisfactory returns.

N. F. BEDARD,
30, 32 and 34 Foundling Street, Montreal.

Do You Want Good Roads?



BUY STEEL
CHAMPION HORSE ROAD ROLLERS

A 7 1/2 ton will exert a pressure of 255 lbs. per lineal inch. all that is ever desired or necessary.

We are the only makers of this Roller in Canada.

- Road Machines
- Rock Crushers
- Road Plows
- Wheel & Drag
- Scrapers.

GOOD ROADS MACHINERY CO., HAMILTON, CANADA

THE SPRAMOTOR WAS AWARDED SILVER MEDAL at Industrial Exhibition, Toronto, 1896. TWO MEDALS at Western Fair, London, Ont., 1895-1896. ELEVEN DIPLOMAS, GOVERNMENT SPRAYING CONTEST, all within a year.



You're Safe with a Spramotor.
Certificate of Official Award.
This is to certify that at the Contest of spraying Apparatus, held at Grimsby on April 2nd and 3rd 1896, under the auspices of the Board of Control of the Fruit Experimental Station of Ontario, in which there were eleven contestants, the Spramotor made by the Spramotor Co. of London, Ont., was awarded first place.
H. L. HUTT, M. PETTIT, Judges.
Central Experimental Farm, Ottawa, March 16th, 1897.
W. H. HEARD, Esq., Manager of Spramotor Co., London, Ont.
Dear Sir,
I have your catalogue for 1897, and in looking it through I find it quite complete, and I am sure that it will be of great service to fruit growers throughout the country. I am much obliged to you for sending me a copy. Yours very truly,
JOHN CRAIG, Horticulturist.
Send 3c stamp for 68 page treatise on the diseases affecting fruit trees and their remedies. Mention "Journal of Agriculture".

High grade Fertilisers!

In bags of 75, 90, 100 pounds for ten square rods as per George Ville, (Paris, "Superphosphates, Nitrates, Sulphates, Chlorures" for:

Wheat, Oats, Beet-sugar, Potatoes, Corn, Flax, Pasture.
Warranted free of any mixture, prepared at market values on receiving orders by
L. de G. BBAUBIEN, R. A. TURENNE,
Canadian Produce Co., St. Louis of Mile End.

POULTRY

Eggs for hatching from first prize winning Silver Wyandotts and White Wyandotts winning a prize on every Entry Montreal Exhibition also Barred Plymouth Rocks. Send for new 1897 Catalogue.
Wm. H. ULLEY,
Royal Poultry Farm, Montreal.

Eggs for sale from the following varieties: Light Brahmans, White and Silver Laced Wyandotts, Barred Plymouth Rocks and White Minorcas. Write for prices.
E. L. GNAEDINGEB, Montreal.

For Sale.—Eggs for hatching from Barred Plymouth Rocks, Light Brahmans, Pekin Ducks, also Tumbler Pigeons for sale. Address:
A. BRUCE, Mount Royal Vale, or Room 15, Street Ry Chambers.

Improved Yorkshires and Suffolks for sale at prices to suit the times.
EXTRA FINE stock ready for shipment with registered Pedigrees.
James H. Lloyd,
St. Laz, Que.

CHEESE AND BUTTER

Factory Outfits Complete
INCLUDING
Engines and Boilers.
R. WHITELAW, Woodstock, Ont.



CHURCH'S ALABASTINE

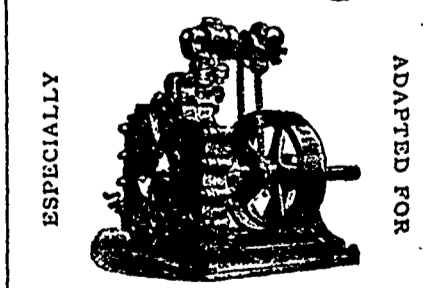
The Permanent Wall-Coating. Does not RUB or SCALE from any hard surface. Coat over coat can be applied. No more washing or scraping of walls necessary. Alabastine is The Sanitary Wall-Coating. Displaces Kalsomines, which decay on the wall. Equally adapted for Ornamental work and plain Tinting. Pleases Painters as well as the general public. Easily applied by any one who can handle a brush. Sixteen beautiful tints and White. Put up in Five-pound packages, and never sold in bulk. The only Wall-Coating that can be mixed in cold Water. No hot water being needed. SAVES TIME AND WASTE. Full directions for use on every package. Sold by leading Hardware and Paint dealers everywhere. Our book "The Decorator's Aid," furnished Painters. Ask your dealer for Tint-Circular showing colors. BEWARE OF IMITATIONS bearing similar names.
THE ALABASTINE COY, LTD.
SOLE MANUFACTURERS - - PARIS, ONTARIO

James Johnston's....

Ayrshires

Several choice Bull calves from this Prize Winning Herd for sale at low prices.
Address ADAM ROBERTSON,
Manager, Compo, Que.

The Dake Engine



CREAMERIES AND FARM PURPOSES.

From 2 to 16 Horse Power.
Write for prices and other information.
THE PHENIX MACHINE CO., - EASTMAN, QUE.
Manufacturers of
Engines and Boilers, Machinery, Repairs, &c.
Also:—Band Saws, Drag Saws, Horse Powers, Fuel-lage Cutters, Threshers, &c.
In 90 124

The Illustrated JOURNAL OF AGRICULTURE

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 only in name, but in fact, anything concerned with agriculture, as Stock-Raising, Horticulture, &c., &c.

ADVERTISEMENTS.

All advertisements appear in both Editions, giving a circulation of

55,500 — ENGLISH, 10,000 FRENCH, 15,500

FOR RATES, address EUSEBE SENECAL & CIE., 20, St. Vincent St., Montreal.

Table of Contents.

THE JUBILEE 1897
OUR QUEEN... 207
The Canadian Fund for the Jubilee 208
THE FARM:
Farm work for May... 209
Grass seeds... 209
Cows... 209
Calves... 210
Ewes... 210
The Horses... 210
Swine... 210
Barn plan... 210
Rotation of crops, W. R. Gilbert on... 210
Practical Farming, Dickson on... 211
Spring, G. Moore on... 212
Selection of seed, Hausen on... 212
Scientific Farming... 213
Drainage... 213
Cultivation of carrots for fodder... 213
THE DAIRY:
Am I dairying at a profit or loss? Weston Parry on... 214
How to use skim-milk... 214
Resolutions for 1897... 215
THE POULTRY-YARD:
A. G. Gilbert on May chickens... 215
Artificial Incubation... 216
Turkeys in Rhode Island... 216
Colored Dorkings... 216
A Typical Wyandotte... 217
Six tons of ducks... 217
MANURES:
Phosphoric acid in Apatite, Shutt on... 218
Care of Farmyard manure, Knight on... 219
Waste of manure... 219
Potash... 219
Manuring grass... 220
Losses in manure, P. Macfarlane on... 220
THE APIARY:
Introduction... 220
HOUSEHOLD MATTERS:
A waist... 221
An iron-holder... 221
About clothes... 221
Plucking chickens... 221
Dampness in walls... 222
THE ORCHARD AND GARDEN:
Care of the fruit-garden... 222
The planting of trees... 222
Older and vinegar... 223

Canadian productions in request in England... 223
SWINE:
A Feeding-Floor for pigs... 224
The brood sow... 224
Over feeding brood sows... 224
Artichokes for hogs... 224
Swine breeders in council... 224
FARMERS' CLUB
A tour in Huntingdon county, G. Moore on... 225
Barnston club... 225
Plan of barn... 225
Coteau-du-lac... 228

SCIENCE:
Rothamsted Experiments, concluded... 228
THE FLOCK:
Questions... 229
Hints for lambing time... 229
Washing and shearing... 229
THE HORSE:
Breeding and using horses... 230
PATENT REPORT... 230

THE ILLUSTRATED Journal of Agriculture.

Montreal, May 1, 1897.

The Jubilee Year, 1897.

OUR QUEEN.

The first word of this caption conveys in this instance, to the thinking mind, far more than the mere possession it treats of. Perhaps this is because of the tone of voice in which it is always uttered.—loving and even reverent—and also for the thoughts it conjures up in the hearer's mind. From the mouth of an Englishman, or British Colonist, it seems to roll forth in a deep sigh of pride, the utterer seemingly chary of losing a single letter of it, and only to be solaced by the pride he has in being able to say it. And well may we all be proud to be able to claim Queen Victoria as "our" Queen. Not only is she a Queen that has for sixty years set an example to the monarchs of the world, as to how the dignity of her high position should be maintained, but also as a woman, she has been a pattern to all her sex in practising these virtues with which the name of a true woman is associated. No Court has ever been so free from scandals socially as has that over which Her Majesty has for so long presided. This may not be because the individual members are any better morally, than those constituting the Court of former monarchs, but simply that the inherent goodness of our Sovereign so permeates her surroundings, that vice of all kinds would be too glaring in such an atmos-

phere, to gain admittance. It is as a true woman and a good mother that our beloved Queen shines just as brightly to her subjects as she does on the throne of England, to all the world. For these qualities she is revered by us, many of us comparing her in our minds with our own mother? Higher praise than this we cannot give, for should not our own mother be our all in all? Though never seen by them, and, may be, oftentimes oppressed by her representatives, still there are hundreds of thousands who speak, in their several tongues, of their "Great White Mother," who rules them from such a distance. Compare the Court of our Queen to that of another great queen, Anne, how different they are! The latter filled with cliques, and favourites descending to all kinds of petty meannesses to gain their several ends, whilst our present Queen in distributing favours is guided solely by the Prime Minister of the time, by her hard

cannot be a doubt but that the Queen, abhorring war as she does, raises her voice in favor of peace when possible. Not that she would have "Peace at any price", for no lioness, would protect her offspring more jealously than would our Queen—if necessary—protect the rights of the meanest of her subjects, or the best traditions of her crown. If ever George Washington deserved the title of Father of his Country, then indeed should Queen Victoria be designated the Mother of the British Empire. No industry undertaken by her subjects, but that is of interest to her. All in connection with farming is one of her especial delights, in memory of the interest taken in it by Prince Albert, and it is only sufficient to look at the horses, sheep and cattle bred by her to prove that she takes keen pleasure in breeding the best. And this is not wonderful, for Her Majesty is a business woman, endowed with an abundance



HER MOST GRACIOUS MAJESTY QUEEN VICTORIA: A. D. 1846.

common sense, and her strict sense of justice. And it is a well known fact that this sense of justice has been unmistakably shown to one or two of her prime ministers, who have advised contrary to her views of right and wrong. Ever mindful for the good of her subjects, Her Majesty is kept from day to day on courant in the news of that day. No accident happens of any importance but she sends her condolences to the widows and orphans, and, more often than not, something more substantial from her private purse, to help alleviate the pain of her sorrowing subjects. Few know indeed how much the woman, not the Queen, gives in private charity. Can it be wondered at that with such a Queen her reign has been one of so much prosperity? Never in the history of the world, has such progress been made in the same space of time, as has been the case in the last-fifty years. Why is this? To a great extent to its having been comparatively speaking a peaceful reign, and there

of common sense, and she knows that it costs no more in the long run to breed highly when breeding for sale, than to turn out animals of an inferior grade. The 22nd of June will indeed be a red letter day in the annals of the world. Not only will the most populous city in the world, added to by hundreds of thousands of visitors, be singing a hymn of thanksgiving to God for so long sparing their Gracious Sovereign, but arrangements have been made that at this opening verse, the news shall be cabled to every land over which the British flag flies, so that for hours the same words of joyful thanksgiving will be wafted heavenwards from the throats of her loyal subjects. We, here in Canada, give place to none in our love for our Sovereign, and no louder voices, or more heartfelt thanks will be forthcoming than those rendered by the Queen's loving subjects in this colony, and the sincerest wish of all will be "Long may she reign over us."

THE CANADIAN FUND
for the commemoration of
THE QUEEN'S DIAMOND JUBILEE
by founding
the Victorian order of nurses in Canada.

PATRON :

His Excellency, the Governor General.

VICE-PATRONS

The Lieutenant Governors ;

Hon. Wilfrid Laurier, Premier ; Hon. Sir Mackenzie Bowell, K. C. M. G., and other Members of the Privy Council ; Archbishops, Bishops, and Representatives of Non-Episcopal Churches ; Judges ; Members of the Provincial Governments ; and the Wives of such of these Gentlemen as are married.

PRESIDENT :

Her Excellency, The Countess of Aberdeen.

VICE-PRESIDENTS .

Senators ; Members of Parliament ; Presidents of Hospital Boards ; Presidents of Medical Councils and Associations ; Members of Provincial Boards of Health ; Professors in Colleges ; Representative Clergymen ; Presidents of Teachers' Associations ; the Wives of such of these Gentlemen as are married ; Presidents of Local Councils of Women, and others.

MRS. EDWARD GRIFFIN.

Honorary Treasurer.

PROFESSOR ROBERTSON

Honorary Secretary

OFFICE :

VICTORIAN ORDER FUND,

Governor-General's Office,
Departmental Buildings,
Ottawa.

EXTRACTS FROM THE ANNOUNCEMENT BY THE PROVINCIAL COMMITTEE

of

THE CANADIAN FUND
for the commemoration of
THE QUEEN'S DIAMOND JUBILEE,
by founding
the Victorian order of nurses in Canada.

Her Majesty, the Queen has indicated her desire that the celebrations to mark the completion of the sixtieth year of her reign, should be associated with efforts towards relieving the sufferings of the sick. Therefore it seems fitting that the people of Canada should commemorate the Queen's Diamond Jubilee by establishing a national fund for the purpose of placing the aid of trained skilful nurses within the reach of all classes of the population.

It is earnestly desired that this Canadian Memorial shall become truly national in its character, as well in the contributions which will make it suitable and effective, as in its application to the different needs and conditions of the various Provinces of Canada, and the several cities and rural districts which compose them.

NOT TO SUPPLANT BUT TO SUPPLEMENT.

Hospitals all over the country are doing splendid work ; but they are crowded to the doors, and have not

funds enough to pay for new furniture, let alone new buildings. Men and women are giving of their best—their time, their thought, their money—to these hospitals. These hospitals require more money for the training of nurses. Part of the funds raised might be expended in helping hospitals to train more nurses, and part might be used in engaging the immediate services of trained nurses who would volunteer to labour on salaries in needy districts in the country and the cities.

PHYSICIANS AND NURSES ARE CO-LABOURERS

This scheme for providing nurses will not displace physicians in the districts where they labour ; but it will furnish the means of securing the best results from the skill and advice of medical men. It is not enough that we have the services of physicians,—even in the cities. In cases of serious illness their services must be supplemented and followed up by the ministrations of trained and skilful nurses.

The presence of a trained nurse brings the cheerfulness and hopefulness of confidence to the sufferer and the family ; and these act like a charm possessing a virtue beyond that of any drug.

THE SCHEME APPROVED AS NATIONAL

After the inauguration of this movement by Her Excellency the Countess of Aberdeen, a public meeting was held at Ottawa on Wednesday, February 10th, under the presidency of His Excellency the Governor General. The following resolution was moved by the Honourable Wilfrid Laurier, Prime Minister of Canada, seconded by the Honourable Clifford Sifton, Minister of the Interior, and carried unanimously :

"That this meeting heartily approves of the general character of the scheme described as the Victorian Order of Home Helpers as a mode of commemoration by the Dominion of the Queen's Diamond Jubilee, and that a fund be opened for the carrying out thereof."

THE NEEDS ARE GREAT.

The urgent need that exists, in the outlying districts of all the Provinces and all the cities of the Dominion, for thoroughly trained, practical women, available as nurses to those who are not rich, seems to be admitted by everybody ; and there appears to be an almost unanimous opinion that no better national scheme could be devised for commemorating the Diamond Jubilee of Her Majesty Queen Victoria, than the establishment on a permanent basis of a Victorian Order of Nurses.

HEROES AND HEROINES AMONG THE PIONEERS.

The people of the newly-settled districts in all the Provinces are not poor in anything except in the opportunities, and privileges which are possessed only by communities in comparatively old settlements. They seek no charity. They are the pioneers who have taken up lands, not alone for themselves, but for the nation. They are conquering for Canada wild and unoccupied territory.

The best types of humanity are often found in those homes. They are sturdy

and independent. They would say : "We do not want any doles of charity through this or any other agency ; but we need adequate medical and nursing help brought within our reach, and are willing to pay for it as far as we can"

The ideals and spirit of the women in the homes of a new settlement in a new country affect the lives, the habits, the aspirations and the principles of the people there for several generations to follow. A despondent mother nimbly the courage and energies of her boys and girls. The unspoken fear of approaching the gate that swings both ways—into new life or into death—without competent skilled help has clouded many a life and home. Nothing that can be done to lift that dull dread, out of the lives of the pioneers in the country and of the poor in the cities, should be left undone, when a National Jubilee in such an Empire as that of Great and Greater Britain is in prospect.

ORGANIZATION OF NURSING WORK IN CITIES.

An improvement of the conditions under which trained nurses follow their devoted and helpful occupation in the cities of Canada is also urgently needed. The sick poor of many families in the cities and towns who have moderate incomes, would be greatly benefited if they could secure even short visits from thoroughly trained nurses.

The Victorian Nurses might do as valuable and as necessary work in the cities of Canada as they could do in the country districts. They would not in any sense or measure encroach upon, or interfere with, the professional work of physicians or with trained nurses who take cases in private homes on the terms usual for such services.

WHO SHALL BE MEMBERS.

It is proposed when the Order is formed, that the members may be :—

- (a) Nurses who are already graduates in good standing of schools of recognised standing and who pass an examination such as may be prescribed ;
- (b) Nurses who shall be specially trained for the Order, and who shall pass the prescribed examination.

The qualifications of the nurses of the Victorian Order are to be of the highest for the class of work they are expected to do.

SOME OF THE OBJECTS OF THE ORDER.

Sickness is always a severe tax upon the resources of the middle classes. It is a heavy burden upon the poor in spite of hospitals and kindly charities. An intelligent trained nurse, prepared to supply what is necessary, is often the best friend a poor family can have.

Some of the chief objects of the Order will be :—

- (a) To provide skilled nurses in sparsely settled and out-lying country districts ;
- (b) To provide skilled nurses to attend the sick poor in their own homes in cities ;
- (c) To provide skilled nurses to attend cases in cities at fixed charges, for persons of small incomes, the charges being paid to the funds of the Order ;
- (d) To provide small lying-in rooms or wards in cottage hospitals or homes ;

(e) To prepare trained nurses thoroughly qualified to carry out these objects.

GENERAL OUTLINE OF BUSINESS ORGANIZATION.

While the details of the working out of the scheme cannot be now definitely settled or announced, some further general outline of what is expected to be accomplished may be stated.

It is proposed that a meeting of all the Vice-Patrons, Vice-Presidents and Representatives of subscribers will be convened at Ottawa when the fund is about to be closed, in order that a committee may be by them elected, to whom all the funds received will be handed over. That Committee will (1) draft a Constitution, (2) decide how the governing body of the new Order is to be chosen and (3) determine how the work to be undertaken shall be carried on.

It has been thought proper to leave as much as possible of the settlement of the details of the scheme as they may be applied to the rural and urban districts, to the judgment of the Committee to be chosen by all the Vice-Patrons, Vice-Presidents and Representatives of the subscribers.

AN ENDOWMENT TO MAKE THE ORDER PERMANENT.

It would not be a prudent thing to have the Order started unless provision be made for perpetuating it. It would take an investment of about a million of dollars to ensure revenue to make this benefaction a lasting one for all the needy districts of Canada. Shall we confess ourselves helpless in the presence of this urgent need and dismiss the cry for help with the remark, "But a million dollars is a great sum to raise!" Certainly a million of dollars is a very large sum to raise ; but if the people of Canada can be fully informed and thereby awakened to the greatness and goodness of this movement, a million of dollars will be forthcoming for the commemoration of the Diamond Jubilee of Her Majesty, by such a means as will cause gratitude to glow continually in the hearts of the people of Canada towards the memory of Victoria the Good, and her Representatives and subjects in Canada who promoted this Order. If half a million of dollars at least is raised immediately to establish a fund sufficient to meet the most urgent demands of the present, the remainder will soon follow according as the people at large see clearly the great benefits that will arise from the carrying out of this thoroughly national scheme.

It would require only a small contribution from each, if every man and woman in Canada gave something out of their plenty, or out of their scanty store, to make other homes as secure as their own. No doubt there will be difficulties to face, but the difficulties will disappear in the presence of enthusiastic hard work and good judgment. That it will be hard to make this scheme a complete success is rather a commendation of, than an objection to it. The things that are best worth doing, are hard to do ; and often in life the things hardest to do, are the things best worth doing well.

PROPOSALS FOR ACTION.

If the Committee to be chosen at the meeting of the Vice-patrons, Vice-pres-

dents and Representatives of subscribers, decides to include the establishment of small Cottage Hospitals or Homes at different points in the outlying country districts and also in the cities. It is proposed that each of such Homes shall be named after donors who subscribe \$1,000 or more.

It is expected that local Committees will be formed to cover the whole Dominion of Canada. Mayors of cities, Wardens of Counties, Reeves of Towns, Reeves of Townships and Villages, are cordially invited to take the initiative in this matter in their several localities.

It is proposed to invite many of the leading newspapers in Canada to open subscription funds and to publish the names of the subscribers in their issues from day to day or from week to week.

The publication is not expected to begin before the 1st of May.

It has been suggested that a special collection be taken up in every school-house in Canada on Friday the 21st of May.

Steps will be taken to appoint Honorary Collectors in different sections throughout the Dominion. These will be furnished with subscription books duly authorizing them to receive subscriptions for the Canadian Fund.

Subscriptions of small sums from those who cannot afford more will be as welcome as the large gifts of rich men and corporations.

A MATCHLESS MEMORIAL.

This will be a matchless memorial of the noblest Queen of any country or age. It will show, as the personal gift of Canadians to Her Majesty, that they admire and appreciate her blameless, beneficent and beautiful life, noble alike in its sympathies and its activities in doing good. It has been the reign of a Monarch doing good for all the people; and thus the Queen need not be concerned for a throne of velvet or gold, or monuments in marble or bronze, since she is enthroned in the hearts of her people, who love her as no Monarch was ever yet beloved. For such a Queen it would be a happier plan to have a memorial in the form of gratitude written perennially in the hearts of the mothers of a young nation, than to have it graven in stone or any inert material. From the women of Canada the music of loving memory will continually swell out in strains of warm and affectionate esteem. The children also, they will rise up and call her blessed! A memorial like that will be sweet to a woman like Queen Victoria.

The Farm.

FARM-WORK FOR MAY

What to sow—Nurse-crops—Cambridge grass-plots How to sow Spontaneous growth of white-clover—Cows—Calves—Sheep—Horses.

GRASS-SEEDS.—Our friend, Mr. George Moore, in his article in the April number of the Journal, adverted to a note of ours on the feeding off of meadows in the fall. Now, we particularly mentioned that, in our opinion, timothy should never be grazed. The meadows we spoke of were those in which many different kinds of grass were sown, such as are our meadows in the old country, which are inva-

riously fed up to the 1st February, from the time the grass is mown for hay, and never suffer from the constant cropping, but rather grow all the thicker in the bottom for it.

We must own our preference for varying the seeds usually sown in this part of the world for the establishment of meadows. A mixture of grasses, known to thrive in this climate and on our soils, is more likely to produce large continuous crops, than where only two sorts, red-clover and timothy are sown; though, on farms near towns, where there is a sale at good prices for hay, and manure can be carried home on the return trip, the two will continue to be grown, and with reason.

Now, there are many kinds of grass, some of which, though they thrive well enough in the countries to the south of us, are not suitable to this climate. It is therefore necessary to be careful as to the kinds we sow, and, to that end, not to pay too much attention to the reports we see in the agricultural papers of the United States; for, though a certain grass may do well, and be quasi permanent in Southern New-York, it by no means follows that it be resist the cold of our more severe winters.

We must, then, depend upon the experience of those who have made it their business to test different sorts of grasses, as well as of other plants grown on the farm, whether for meadow or pasture, and though there may be cases in which further investigation may show that there are other kinds that are suitable to our soils and our climate, we have enough data already to enable us to say, with some degree of accuracy, that the following grasses and clovers, if the seed is properly committed to the land, will answer our purpose.

GRASS-SEEDS FOR MEADOWS

The following is the list of grasses that Professor Fletcher, of the Experiment Farm, at Ottawa, recommends for meadows intended to stand for several years:

GRASSES	
Timothy	6 lbs.
Meadow fescue	4 "
Orchard	2 "
Kentucky blue-grass	1 "
CLOVERS	
Mammoth-red	2 "
Alsike	2 "
Lucerne	2 "
White-Dutch	2 "
21 lbs.	

Though we approve of this sowing grain, if sown early on well prepared land, we confess to have a passion for the thick seeding of grasses.

Another, that we believe to be likely to answer well for this part of the country, is composed of:

Perennial clover (true cow-grass)	2 lbs.
Common red-clover	4 "
Alsike clover	4 "
White clover	2 "
Trefoil (yellow)	2 "
Lucerne	4 "
Timothy	3 "
Orchard-grass	6 "
Pacey's perennial rye-grass	10 "
36 lbs.	

to the acre; 1-6 less to the arpent.

And, one question we should like to ask. Has any one of our seedsmen ever tried the true "Pacey's perennial rye-

grass?" That there has been many a failure of the common perennial rye-grass we know; but the sort we recommend, thrives and lasts well in Denmark, in climatic conditions no less severe than our own, and we do hope that this most permanent, most productive, and therefore, most valuable of all our grasses will not be neglected any longer. It is only in these last days that the lucerne has begun to be recognised as something more than a "fad" of the "Gentleman-farmer," and we feel perfectly convinced that a fair trial of the Pacey will prove that it is a practically valuable acquisition.

Where the rye-grass cannot be had we should amend—or rather, alter—our list by substituting, for the ten pounds of that seed, 2 pounds more of timothy, 4 pounds more of orchard-grass, and 2 pounds each of meadow-fescue and meadow-fortail.

The greater variety of grasses sown, the greater chance there is that some one, or more, of them may prove to be permanent. The grasses mentioned in our list will, as long as they occupy the soil, afford spring-feed, a crop of hay, and good fall-pasture, though, of course, when hay is the principal object, the meadow should not be grazed in the spring. How long the meadow will last is a question. Sooner or later, most of the sown grasses will die out; and be succeeded by the grasses indigenous to the soil. Whether these supplementary grasses be of good or of bad quality, will depend greatly on the manurial dressings, and the general treatment given to the meadow during the earlier stages of its occupation of the land.

The main point connected with the permanency of the grasses is to prevent them from going to seed (or in young pastures, even throwing up their seed-bearing culms). To this end, we would strongly recommend early mowing, during the first two or three years, at least, or for pastures, the practice, almost universal in England, of feeding closely mown grass with young cattle.

Some 15 or 16 years ago, we grossly offended the then guardian of the "Viger Gardens," in Montreal, by telling him that if he persisted in allowing the newly sown lawn-grasses there to run up, as they were doing, he would never get them to form a close bottom. He scorned our advice; the consequence was, that, the following year, the piece had to be broken up again and re-sown. The new layer, being kept well and regularly mown and rolled, soon formed a close, firm turf, and since that time there has been no failure with newly laid down lawns. It is to this practice, more than to anything else, that we attribute the permanency of the Sherbrooke street lawns.

What was the reply of the Fellow of Trin. Coll., Cambridge, to the lady who asked how she could manage to have such beautiful velvety grass-plots? "Well, madam; you have only to keep your lawns regularly mown and rolled for some two or three centuries, and they will be as fine as ours."

As a rule, grass-seeds are sown with the grain in spring, and, provided the preparation of the land has been as it should be, they succeed just as well as if they were sown alone. As for "nurse-crops" as they are called in some of the agricultural papers in the States, we do not see the force of the epithet, as applied to the barley, etc., with which grass-seeds are sown. They certainly do not feed or protect the young grasses; they, if anything, de-

prive them of a part of the plant-food existing in the soil, and no protection is needed by the grasses that the growing grain can supply. There is this advantage: while the young seeds are getting a hold on the land, the grain is growing and ripening, and, thereby, putting money into the farmer's pocket that he would otherwise have to go without. As for sowing smaller quantities of grain to the acre by way of shading the young seeds less, that is an absurdity, too, for, if the land is in good heart, the grain will tiller and produce as much straw, and therefore as much shade, as if it had been sown thicker.

A grass that is new to us we find mentioned with great praise in Prof. Fletcher's evidence before the Committee of the House at Ottawa, A. D. 1893. It bears the curious name of "Wood Drop-seed grass!" See p .

There is a curious fact connected with white-clover that perhaps has not been noticed by some of our readers; it is this: its apparent spontaneous growth. The truth is, that in very dry and poor sandy soils it is often so small and grows so flat among the lower leaves of the herbage that it is not perceptible unless a turf be cut and carefully examined by driving it; hence on breaking up and manuring such soils, or simply manuring by top-dressing, a spontaneous crop of white clover appears where it was never observed before, and without any supply of seed. This undoubtedly to a great extent explains the remarkable results we have seen follow the application of lime in any form. We clearly remember the effect of a dressing of ditch-scrapings and lime on a worn out meadow, at Chislehurst, Kent, where the "trifolium repens" sprung up in marvellous abundance in places where no clover of any sort had been seen for years.

IN SOWING GRASS-SEEDS, we favour the plan of going twice over the ground, once with the true grasses, along the ridges, and then with the clovers, across them. The reason for this is too obvious to need explanation.

Bury the seeds, but not too deep. If sown after the grain is up, before rolling, that operation will cover them enough, and that was always our favourite way of dealing with them. If sown by the machine or barrow, great care should be taken to make the seed trough slightly overlap each journey, as a vacant space is invariably filled up with an abundant growth of weeds.

Lastly, sow early, that the young plants may have a chance to benefit by the rains, that almost invariably fall about the first or second week in June, to extend their roots, and get a firm hold on the soil.

COWS.—By the time this reaches our readers, the cows will, in all probability, have all calved. No green-meats for them yet—not for another three weeks, however early the spring may be. (1) Nothing injures grass so much as feeding it off too soon. But, though the cows must wait yet a little longer for their favorite food, be careful to give them as much succulent fodder as shall prevent them from shrinking in their milk before turning out time. Now is the season for making use of the mangel crop of last autumn, for the roots will have parted with a good deal of their water, and, consequently, the nutriment

(1) Two glorious days of rain in April 15th and 17th, with a superbly brilliant Good Friday between them. LUCERNE COMING ON WELL!—ED.

they contain is in a more concentrated form.

THE CALVES are now rioting in plenty of milk; not full-cream, of course, but closely skimmed, with a moderate addition of the fat contained in flaxseed, to make up for the loss of the fat in the milk that has taken its way to market in the form of butter or cheese. Never give calves milk below 90° in temperature. Nothing is so likely as cold milk to produce diarrhoea. As soon as they can eat it, a little of the greenest clover hay should be given them to pick at. Keep them under shelter, if a cold wind from the east sets in, and if you see their coats staring. As for turning calves out into an orchard or a small enclosure and keeping them there for months, until every square foot of it has been befouled by the constant tramping of the poor things, and every blade of poor grass has been polluted by reiterated breathings on it from their lungs, this, we are sure is a practice that no sensible farmer is guilty of following. We only mention it, because we saw it practised, three years ago, at Beaconsfield, by a man who ought to have known better. If the calves must, for convenience sake, be kept near the farm house, and the pasture lot is small, divide it in two, or better, in three, and give it to them, turn about.

EWES, now suckling their lambs, will amply repay any liberality in the form of roots, etc. Any clover-hay left, even after the calves have picked it over, will be eagerly devoured. It takes some time to teach people that ewes, from first to last, must have nitrogenous food. They cannot keep up their strength without it, whether while pregnant, or while they are suckling their young. As for timothy-hay, however green it may be cut, we almost go so far as to prefer well cured peas-traw to it, for this purpose.

THE HORSES are now hard at work, and for long hours. Poor dears! they do not cry out for an "8 hours day;" and, if they could and did, no one would pay any attention to them. All we can do to help them is to give them plenty of good, sound food. Three bushels of oats a week a piece: with clover-hay chaffed, and as much timothy-hay as they will eat, are none too much for them; and, as we remarked the other day, a cold bran-mash on Saturday night, and a whole day's rest in the stable on Sunday, will help them amazingly.

SWINE as yet, have had no opportunity of helping themselves to a salad, but have greedily availed themselves, no doubt, of every scrap of turnip or mangel that has fallen from the manger of the cow or the sheep. The clovers will soon be ready for them, and, if pastured, will benefit sows and pigs amazingly. It is a remarkable fact, but an assured one, that young pigs when out acorning in our woods, in England, used to make an amount of growth in a month that was double their ordinary growth in that time, and it was all sound, lean-growth, not fat. So much for a fair amount of exercise. We must remember that fat hogs; bladders of lard; are not wanted now. A few pease given once a day will do the young pigs good, and should be given to them in a pen, separate from the older ones. Theory apart: corn makes fat; pease and beans make lean-meat. Of course, a little corn later in the season will not hurt the pigs, as the skim-milk will aid the pease.

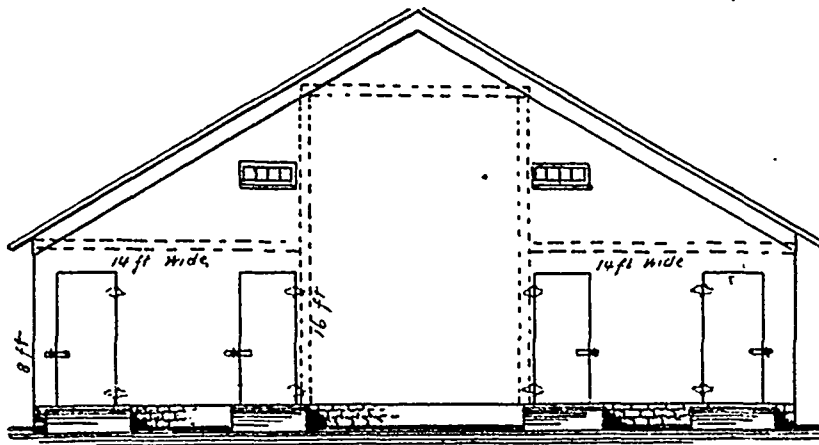
BARN PLAN AND SINGLE BOARD SILO

By an "Arkansas Traveller."

"Ed. Hoard's Dairyman:"—In your issue of the 11th ult. in replying to an inquiry for plan for barn, you passed the question down to the readers of the "Dairyman" for answer. I very modestly give you the plan of one I had built last summer. The silo is built with horizontal girths, 8 x 2 inch stuff,

per thousand feet. The matched flooring I think was fifteen dollars per thousand. Anyone can see there is not much mow room, but as most of the hay we use is baled, I can put away several tons and a considerable amount of bedding.

An improvement on the plan would be to make the silo two feet deeper and the stable, or lean-to (as you northern folks call it) two feet wider, giving twelve feet for cows and four feet for feeding alley. The ensilage is thrown



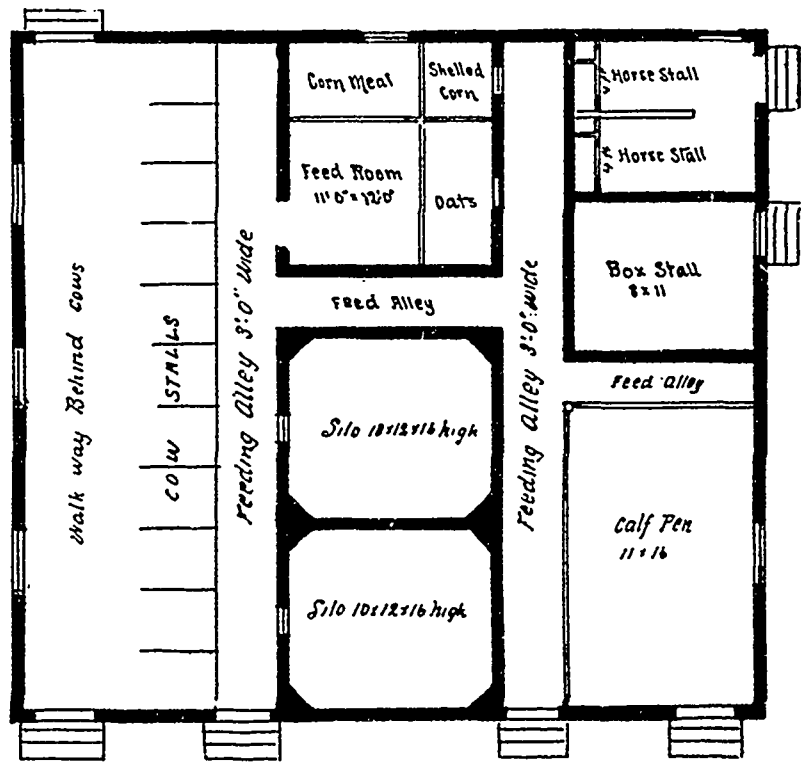
FRONT ELEVATION

beginning sixteen inches apart at the bottom, and increasing to thirty inches at the top. It is lined with only one thickness of boards, they being six inch matched flooring, best grade, with a good coat of coal tar on inside. No building paper was used, except in the corners. The carpenter did not make a very good job in finishing the corners. The ensilage is in excellent condition, except a little at the door. I will say, however, that the silo was filled im-

mediately after being built. I think when the ensilage is all out and the hot dry weather comes on in summer, it may open, until I may have to line the inside with tarred paper.

Referring to the general arrangement of the barn will say that it was gotten up for a cheap cow barn, and the drawing of the plan on paper is something entirely new to me and is very poorly done. The barn and silo together cost about two hundred dollars. Most of the lumber was bought at ten dollars

down into the feeding alley and into the boxes with a large grain shovel. I am using the model cow stall described in your paper last summer. Like it very well, but not so well as the Bidwell stall, but they are too expensive. Any criticism you may make on my "cheap John" barn will be received in a good spirit. Am feeding corn silage, prairie hay, with wheat bran, and enough cotton seed meal to balance up my ration so



FLOOR PLAN

Hoard's Dairyman

as to make it about 1 to 6. Some one made inquiry a short time ago about making ensilage of sorghum. During my connection with the experiment station a few years ago, we raised a great many varieties of sorghum for analysis, and late in the fall, after we were through, we made up the sorghum into ensilage, rejecting the seed, and fed out in January a very fine lot of ensilage to cows and beef steers, but without making any actual experiments. I think to make good en-

silage, it should be thoroughly ripe, otherwise it would develop too much acid. With many kind wishes for the success of your paper, I am yours truly. W. F. BATES. Arkansas.

silage, it should be thoroughly ripe, otherwise it would develop too much acid.

With many kind wishes for the success of your paper, I am yours truly. W. F. BATES. Arkansas.

Arkansas.

ROTATION OF CROPS.

In a well-planned system of farming, the subject of crop rotation should be carefully considered, even in these days of keen agricultural competition, as one of the essential elements of success in its highest and best sense.

It is admitted by those competent to decide, that the practice of rotation, is the foundation of all the improvements in ordinary agriculture. The early writers on this subject, even from the times of the Greeks and Romans, fully recognised the advantages of alternating their crops, being satisfied that a variety of crops, possessing different habits of above-ground growth, and of root range, other things being equal, would give a greater aggregate yield than could otherwise be obtained. Thus, not only was it found that certain leguminous crops, such as the clovers, beans, vetches, etc., were valuable as food for farm animals, but that their growth enriched the soil for succeeding crops, in fact, that they were of the utmost value, as restorative crops grown in alternation with cereals. Further, there can be no doubt that the effect of the extension of the growth of green crops was, to a great extent, to get rid of unprofitable bare fallows, greatly to increase the supply of stock food, especially for winter feeding, so to lead up to a largely increased production of meat and milk, of a greatly increased supply of home-made manure, and thus to enrich the land, for the growth of grain, which resulted in much larger crops, than could otherwise have been so economically obtained.

At Rothamsted, England, on Sir John Lawes' property, where for years many lines of experimental investigation have been successfully conducted, has been obtained nearly as much wheat in eight crops alternated with eight crops of beans, as in sixteen crops of wheat grown consecutively, without manure, in another field, and also nearly as much wheat, as in eight crops alternated with bare fallow. Again, it is recorded that on one portion of a field devoted to a four-course rotation, a produce of 1307 lbs. of clover hay per acre, and 8 1/4 bushels of beans per acre, grown without manure, was followed in yield with 26 3/4 bushels of wheat per acre: while another portion of the same field, which had been manured with a mineral manure containing potash—which ingredient is known to be so valuable for the successful growth of the clovers—after yielding 4,000 lbs of clover hay per acre, and 24 bushels of bean per acre, yielded 47 1/2 bushels per acre of wheat. Against this, a corresponding plot of land, which had been left in bare fallow in the same field, yielded in the same year only 38 3/4 bushels of wheat. Here, then, is a striking illustration of the advantage of the interpolation of leguminous crops instead of bare fallow, with the cereals in farm rotations: and the facts show clearly that the benefit may be the greater if the land be not abnormally exhausted, as was the case in the above mentioned continuously unmanured plot.

When it is seen that nitrogen, as a

fertiliser, has given the best results with wheat, and that the crops of beans and clover, alternated with wheat, drew from the soil something like twice as much nitrogen each year, as a crop of wheat, when it was grown continuously, the results are not only remarkable, but of great practical service.

The yield of a cereal crop, therefore, can be nearly doubled by alternation with a leguminous crop that makes a draft upon the soil of more than twice as much nitrogen, the very element of fertility that produces bulky crops of grain. In other words, not only are the nitrogen, and the other food constituents obtained in the leguminous crops, an entire gain to the farmer, compared with the result of bare fallow, but in the average of years a larger succeeding wheat crop, both of grain and straw, will be obtained as well.

Experiments like these are extremely valuable to the farmer, because they show conclusively that what are called the exhausting effects of a crop, are not to be measured exclusively by what is removed from the land.

Many theories have been advanced to explain the well established influence of one crop upon the growth of another. As chemical analyses of plants, show that crops differ in their ash constituents—viz: potash, soda, lime, magnesia, phosphoric acid, etc.—it was assumed that their demands upon the soil would differ also, and that this fact largely explained the advantages of rotations. The assumed sources of nitrogen was, however, a more important factor in the case, and crops were classified as exhausting, when, on analysis of the plant the mineral constituents predominated, and as restorative, when the plants contained in their composition a large proportion of nitrogen, which they were supposed to draw from the atmosphere, by means of their broader leaves, which characterised them.

The cereals, including, wheat, oats, barley, rye, maize, were thus placed in the group of exhausting crops: while clover and other leguminous crops, and even root crops, were placed in the restorative group.

Upon this point that distinguished authority Sir John Lawes, says as to the source of the nitrogen of the so-called "restorative crops," his experiments show, that certainly in the case of the roots, turnips, swedes, mangolds, it is not, as has been sometimes assumed, that such plants take up nitrogen from the air by virtue of their extended leaf-surface.

These investigations clearly demonstrate, that they are as dependent, as any crop that is grown, on available nitrogen within the soil, which is generally supplied by the direct application of nitrogenous manures—home-made or commercial. Under such conditions of supply, the root crops, being exceedingly gross feeders, and distributing a very large amount of fibrous feeding root within the soil, avail themselves of a much greater quantity of the nitrogen supplied than the cereals would do, under similar circumstances: this result being partly due to their period of accumulation and growth extending even months after the period of collection by the ripening cereals has terminated; and also at the seasons of the year, when nitrification of the soil is most active, and the accumulation of nitrate-food in it is the greatest. Again, a full supply of both mineral constituents being at hand, these root crops assimilate a very large amount of car-

bon from the atmosphere, and produce, besides nitrogenous food products, a very large amount of sugar material, as respiratory and fat forming food for the live stock of the farm. Very much the same may be said of the maize grown as a fodder crop (this side of the Atlantic), as of roots grown in rotation in England. There can be no doubt that the maize derives its nitrogen from the soil, collecting and storing it up some time longer than wheat, thus availing itself of the nitrates formed after the growth of the wheat has ceased.

The very highly nitrogenous leguminous crops on the other hand, although not characteristically benefited by nitrogenous manures, nevertheless contribute much more nitrogen to the total produce obtained in a rotation, than any other of the crops comprised in it. It is also certain that a very large proportion of the nitrogen of these crops, is derived from the soil and subsoil, though recent investigations have proved that some of the nitrogen, and frequently a considerable part of it, may be obtained indirectly from the free nitrogen of the atmosphere.

It is thus that nitrogenous leguminous fodder crops and more especially clover, which has a much more prolonged period of growth, and much more extended range of root collection within the soil, and subsoil, than any of the other crops of the rotation, yield in their produce, the largest amount of nitrogen, and consequently of stock food per acre. Much of this is doubtless taken up as nitrate, yet the direct application of nitrate of soda as manure, has comparatively little beneficial influence on the growth of clovers, vetches, and such like crops.

The general result of this fact is that, although undoubtedly the clovers take up a good deal of their nitrogen, as nitrate, this would seem to be derived from accumulations within the soil, which are brought into suitable conditions of combination, and distributed through a wide range of soil and subsoil.

The present fertility of a soil is thus shown to be, to a very large extent, a result of its previous productiveness, which fact is contrary to the opinion which prevailed a few years ago.

It will be readily seen from what has been stated, that a variety of crops, grown in succession, will tend to economise the elements of fertility in the soil, so that the greatest aggregate returns for natural productiveness, or for manures applied, would be obtained: while the continuous growth of a single crop would result in the waste of some of the valuable constituents of the soil, which are not in a form available for it, but which could be made use of by other crops.

W. R. GILBERT.

PRACTICAL FARMING

(By James Dickson, Trenholmeville, Q.)

Potatoes—Wheat versus Green Oats—Turnips—Scratches—Haring.

Potatoes.—The prices ranging from 20c in some seasons (they are now 15c in some sections) to 50c in some others, would serve to show that the climatic influence in favor of the potato crop is greater some seasons than others. This being a matter impossible to anticipate, the safest plan undoubtedly is, for each farmer to plant more than a sufficiency

for his own table use, and should the crop prove extra throughout the county, and consequently cheap, they are still worth 25c a bushel to feed to lambing ewes.

The rule adopted by some old farmers, that one bushel of potatoes and one of oats are good to feed to any animal as two bushels of oats, is not far astray. An analysis would not show all the same proportion of food, but practice proves that, like turnips, there is a beneficial action upon the animal system, which an analyst cannot estimate. And even one lb. a day to each ewe, for 15 or 20 days previous to lamb dropping, will show a marked improvement in their stamina and vigor. An extra lamb raised will pay for all the potato fed, and the pleasure and profit of fat lambs, and a good thrifty flock will be clear gain. And a couple of feeds a week to the horses will please them as well, and be better for them than the usual oats.

In the early days of Canada, when the settlers' farms were a few acres hedged in by the forest, nature was more generous than at the present day. The same kinds of potatoes continued as fruitful as ever. There was no rust, no rot, and no check to growth until the frosts of autumn. Then potatoes were planted in hills three feet apart, and the saying was, "the bigger the hill the bigger the crop." Sometimes they were hilled at the time of planting, nothing further being necessary until digging time, except to cut out the fire-weeds (something that many of our younger farmers never saw) and with this treatment, one hill would often suffice for a family dinner. Many more potatoes were used in those days, the mills were poor affairs, and it was sometimes impossible for the best housewife to make good bread. I remember of a workman complaining to the girl of the poor bread she gave him. She said "Ye spalpeen, that niver tasted bread till you kem to Ameriky, barrin a penny bun on market day, warent ye raised on prafles in Oireland?" He answered, Arrah Bridget an thats thure for ye, but sure the praties in Oireland war better than the bread ye hev in Ameriky." And that also was true even of the potatoes and bread of Canada.

The fact that potatoes were easier raised in former years is often adverted to, as proof that the soil is now not so capable of producing crops. It may be true that there is less potash in the soil than in the earlier days of the country, but it is also true that in Ireland prolific crops were obtained until the failure of the potato, and the consequent famine year which came upon the scene like a thunder bolt. And it is also a fact that north and east of Quebec, and the Maritime Provinces which were settled long previous to the more southern and western parts of the Province, still grow abundant crops of the very best potatoes. And observing that some districts produce better corn, some wheat, others heavier oats, and better peas. It certainly shows that the soil and cultivation are not the only factors in producing a good crop of potatoes. Nevertheless much can be done by the farmer towards that object. Few will admit that they do not know everything about how to grow potatoes. To those few let me say, the less clay there is in the land, the better, a sandy loam being the best. If only a clay loam is obtainable, use manure with a great deal of straw in it. Plough it in with a grass sod the previous August or September. In spring

cross plough, slightly deeper than the fall ploughing. If for early potatoes, draw a light furrow as soon as the land is sufficiently dry, and cover with the hoe. By this method they can be planted just deep enough to protect them from drought, and yet sufficiently near the surface to get advantage of warmth. A week or ten days before planting, the seed can be advanced by scattering them two and three deep in a warm sheltered place, (a south verandah is an excellent place) covering them with earth or damp sawdust, they can be raked out and cut at any time and re-covered, care being taken to keep it moist. Make the drills in the morning, plant and cover at once, after the sun has warmed the soil. For early potatoes and on late moist lands, and late seasons, this system will be found advantageous.

For general culture. Although it is convenient to have the potato field near the house, it is economy to go farther to obtain a suitable soil. In every case there is nothing like a grass sod and straw manure ploughed in. On light loamy land that does not run or set together, the spring ploughing may be omitted, by using a spring tooth or disc harrow, and in that case, the manure previously spread on the top. It will be observed I speak of grass sod and straw manure. This is particularly necessary to give the land the requisite tilth and humus for the potato root. A rotten manure and sodden soil may show a flourishing field, but will not produce a good crop, and most seasons will not grow a good quality of potato.

On loose, friable land it will be found economical to draw the drills as in turnips, drop the seed and split the drills, the field being left in this way for a week or more, until the weeds begin to show. A brush harrow being then used cross-ways to level the drills and cover the weeds. The next implement used is the harrow. By this time the potatoes are peeping out. Drive lengthways, keep the horses astride the rows, out to the end, do not turn on the potatoes.

The next culture can be done cross-ways with a horse hay-rake, at perhaps two different times, after which the cultivator and mould boards as required. It pays to run over the rows with a hoe filling in between the plants. In spite of all this cultivation sometimes large weeds for which I have no name will spring up. Previous to seeding, these can be cut with a Scotch hook attached to a light handle five or six feet long.

To clean the land preparatory to digging, I know of nothing better than a horse-rake with another head attached, making a double rake. (In this way also as cultivator).

It is useless to speak of the bug—how far he can come, when from, or from what point he watches operations. One thing is certain, he is there when the first green leaf peeps out, and keeps you company to the end, and despairingly buries himself when the last cart is trundled to the cellar. But he is so easily kept in check with the watering can and Paris green that he is of little account.

It is very generally conceded that the middle sized potatoes are the best to use for seed, and cut with two eyes to a piece, and dropped in the score of the drill, ten to twelve inches apart. With a perfect growth this is quite thick enough. Do not cut a tainted potato, regardless of its promise. Sometimes a potato hopelessly bad, under the for-

cing system I suggest, will start sprouts as if in dying effort to fulfill its duty. It would do the same in the ground, leaving blanks in the row.

Some scientists tell us that the rust is living parasites, that they are planted with the potato, and can be killed by sprinkling the seed with lime. I have tried it without success. The emulsion to sprinkle on the top in Autumn I have also tried. It is obvious, however, that practically that cannot answer the full requirements of the case. At that time the tops are difficult to go through, and unless the stalks are sprinkled as well as the leaves the plant must die. The difficulty of reaching them and the prices our druggists demand for the necessary ingredients, compels me to say, that it does not pay.

WHEAT VERSUS GREEN OATS.—For twelve years I have grown no wheat, although in my clay loam I can grow the very best. I will not further occupy valuable space discussing this subject. (and perhaps I ought to apologize for thus persisting on this matter) only to ask my brother farmers to consider that superior flour can be brought from Manitoba at comparatively less cost. That nearly every farmer buys cattle feed to some extent every year. That an acre of wheat land will grow three tons of the best of cattle feed. No thrashing, no grinding. Every straw eaten up clean, while wheat straw is worthless for feed. Sow all the richest and late lands for green oats, and cut early. Some are not satisfied with the results of last trial, that is because they did not cut early enough.

For seed and horse feed, sow the higher, early land, and sow early—early, grain is heavier.

TURNIPS.—See issue of June 1896. If you have a few square bony steers or heifers fit for stall feeding try a piece to feed with green oats.

SCRATCHES.—(1) This is the season for them. Cause, the heated constipated condition of the system, aggravated by wet and dirt. Or, according to some authorities, chapped heels caused by wet and dirt, and aggravated by the impure condition of the system. The result, and cure, however, are the same. Feed with bran mash or turnips—potatoes are better than either—and dress the sores with old chamberlye.

HAIRING.—If horses and cattle are in as good condition as they ought to be, they are now shedding their hair, and something can be done to aid nature in her efforts to the very great comfort of the animals, and properly taken hold of, it is a very simple matter. Unless the animals are so poor that a fine toothed comb would hurt their bare ribs, for speed, cleanliness, and pleasure, there is nothing like a long handled hoe, with this, there is no necessity of getting between the cattle, and being covered and stifled with dirt. It is only a pleasure to go over them a couple of times a week. And the ease with which a horse can be thoroughly cleaned, out of doors on a breezy day, will be very satisfactory.

ROOMS FOR JULY AND AUGUST.—The editor is anxious to get furnished rooms for a friend of his, his wife and two children, during the above mentioned months, within 15 miles of Montreal.

"SPRING"

I come! I come! ye have called me
I come o'er the mountains with light
Ye may trace my steps in the waken-
By the winds which tell of the violets
By the primrose stars in the shadowy
By the green leaves opening as I pass.
Mrs. HEMANS.

The glad season of spring has been a favourite theme by poets in all ages. In a climate like this, where nature has been held in the cruel grip of winter for so long, its coming is the more grateful, and full of delights unknown to those who dwell in latitudes where the transition from vegetative rest to life and activity is not so remarkable.

Spring is really the commencement of the year from a natural standpoint, although we are well advanced in it, according to the calendar we adopt, and we have got to the beginning of summer before we feel the genial influences of spring.

The ice has not left the rivers and lakes, the snow is yet on the hill tops, the poor sheep stand forlorn and shivering upon the bare pastures: the cattle are longing for the June grass, after their long confinement in winter quarters, instead of their dry, preserved forage and for the sweet herbage which is to them Oh! so delicious!—also for the time when they can roam at will over the broad meadow, quench their thirst at the pure rivulet, bathe knee-deep in the shallow pond, or lie down dreamily chewing their cud secure from the noon-tide heat under the trees. But the lengthening days, the sun's wider circuit in the sky and his glowing heat when he shines upon us between the storm clouds proclaim that we shall not have much longer to wait before the season of bustle and activity will be upon us—and we must try to keep pace with nature.

This tardy coming of spring makes farming somewhat more difficult than in countries where its advent is more gradual; the fact that the sun has attained so much power makes the season of seed time so much shorter, and germination and growth so much quicker, that it is necessary to the cultivators to be on the alert to keep up with the speed with which the wheels of nature revolve when she gets the steam up. We should not wait two or three weeks, after the weather is favourable to do so while we prepare the land to put in the crop,—therefore we should make every preparation we can for this rush as far as ploughing, ditching and other operations which we can do in the fall, can be done; and during the long winter, if we have not got every implement, tool or set of harness in perfect order for work, when the time comes to use them, we shall find that we have been wasting time which might have appeared of little value then, but is of the utmost consequence now.

It puts me out of patience to see a man running about to find a bolt, a screw, a linchpin, or some other indispensable article, before he can begin his day's work on a fine spring day, when every moment is golden. Or, perhaps, putting off the job until to-morrow which ought to have been done to-day, and, when to-morrow comes, it brings rain and spoils the land which was in good condition for the proposed work,

so that a delay is caused in putting in the crop which is fatal to its success—all because we deferred the work for, what we thought, a single day.

Experiments prove that there are tens of thousands of dollars lost to the farmer by not sowing as early as the land is in condition to receive the crop. Seeing too that the season is so short, it is a wise precaution to plant only the earliest varieties of various grains, especially oats; these ripen early in the autumn and give us the best yield, because their growth has been made at the best season when all the forces of nature are the most active to promote it. Then there is other work beside sowing that requires punctual attention at this busy season. Top dressing, manuring, rolling the meadow—don't neglect this whatever you do. It can be done on a day when you cannot work on the ploughed land, and will make a surprising difference to the hay crop. Then make your calculations and sow what quantity of green forage crop you think you will require to keep your stock in good condition during the fall months. This is most important. Soon killing weeds will be in order, and remember there is no time when they are so easily killed as when they are weaklings. If you wait until they get ahead of you, they will be troublesome enemies. Spraying of enemies, don't forget that we have others besides weeds no less injurious and more insidious in their attacks. I mean the fungous growths which attack our fruit trees and potatoes. The injury these will produce, it has been completely demonstrated, can be prevented by careful attention to spraying, of which so much is written that it will be our fault if we do not attend to it.

Our success will be commensurate with the attention we pay to the process of cultivation, and we may ever overcome some difficulties and avoid disappointment and loss, if we make up our minds to watch all the points and use measures we know will answer the purpose for which they are intended. If we do our duty, we can rely upon the promise that summer and winter, seed time and harvest, shall not fail.

GEO. MOORE.

IMPORTANCE OF THE SELECTION OF SEED

Choice of seed oats - results.

Too many farmers make the mistake of considering any seed which is not positively bad as being good enough for seedling purposes. It will hardly be denied that this is a frequent source of poor crops. In reality, it is more economical to keep only the very best seed for sowing. But, the importance of the choice of good seed being realized, it may be asked, How is the selection of the best seed to be made? Sorting seed by hand would be a very tedious task and this method must be dismissed as impracticable. According to the "Revue scientifique," the following process has been made use of by M. Petit and others with excellent results in the case of oats.

Take the grain about which you may have any doubts and throw it into a pail of water. A part will rise to the top of the water; this lighter portion should be removed, dried, and fed to the live stock or sold, as it is of little value as seed. The part which has sunk to the bottom should be carefully collected and dried, as it is the best for sowing.

For purposes of comparison and in order to put the matter to a practical test, M. Petit sowed two fields exactly similar in soil, exposure and in all other respects, with both these kinds of seed, the heavy and the light. The field sown with the heavy seed yielded a crop, almost twice that obtained from the land sown with the lighter grain. The expenses in manuring, labour, etc., being the same in both cases—except perhaps in the cost of harvesting—there is therefore a marked advantage in carefully selecting the seed to be used for sowing and in keeping only the heavier sort in order to get the best results.

As seedling time is so near at hand, it may not be amiss to remind our farmers once more of the excellent work being carried on by the Ottawa Experimental Farm and others, together with our Syndicates, in introducing and supplying good seed; any body obtaining seed from either of these sources will be certain to get the very best of its kind obtainable.

SMUT IN SMALL GRAIN.

While treating of the important subject of seed, I ought not to omit to draw the attention of farmers to the loss caused every year to our crop of small grain by smut. This source of damage is in great part preventable by thoroughly bluestoning the seed before it is put in the ground. Certain conditions seem much more favourable than others for the development of the fungus. Thus, the spring of 1895 with its long periods of cold accompanied by copious rains seems to have afforded conditions very suitable to its attacks on young wheat plants in Manitoba and the North-West. In 1891 also a good deal of hard smut occurred in the same district.

Dr. Jas. Fletcher, the Dominion entomologist and botanist, has already dealt with the subject at some length in C. B. F. Bulletin No. 3, where the growth of the smut fungus is treated of from the spore to the stage when it attacks the young wheat plants.

At first it leads a separate existence, deriving its nourishment directly from the soil and it is only later when its spawn reaches the wheat plant that it becomes parasitic on the tissues of its host; so that the prevalence of or freedom from smut varies with the conditions for its growth—favourable or otherwise—before it reaches the wheat plant. The life-history of this pest has been known for a long time and it is a matter of regret that farmers do not more generally employ the operation of bluestoning or "pickling" the seed to prevent so much loss. Dr. Fletcher instances some plots which Mr. Mackay had growing, side by side, of treated and untreated wheat, showing very plainly the great advantage of attending carefully to this matter. Moreover, this remedy has been employed among the farmers of Great Britain for a great many years, for they found out that wherever it was used their crops were much freer from its attacks. The treatment is both inexpensive and easy of application and will many times repay the extra trouble incurred.

REMEDIES.

The ball smut in wheat and the loose smut in oats and barley may for all practical purposes be considered as the same, for the same treatment may be employed in meeting the attacks of all. Various remedies have been proposed. The two following seem to recommend themselves most to those who have had the greatest experience in their applica-

(1) Called, in England, the Grease. Ed.

tion and will probably meet all requirements:

(a.) Make a solution of sulphate of copper or blue-vitriol in water, using one pound of the former to twenty gallons of water.

The grain should be put in this mixture and well stirred in order that the solution may reach every part; after being allowed to remain in this twelve hours, the seed should be put in lime water, made by slaking one pound of lime in one gallon of water, and allowed to soak for ten minutes. The grain may then be spread out thin to dry.

(b) For every two gallons of water use one pound of blue-stone or copper sulphate. The solution should be put in a large receptacle and grain added till it reaches almost the top of the liquid. Stir the mixture well and remove all scum as it rises to the surface. After allowing to stand for fifteen minutes remove from the liquid and spread out to dry as before; then sift dry quick lime over it.

In cases where the foregoing are not adapted, use the following treatment:

(c) The grain may be conveniently placed in a wagon box while it is being sprinkled by two persons with the following mixture, made by dissolving two pounds of blue-stone in a bucketful of hot water. One attendant should keep the seed well stirred while this operation is being performed. Use this proportion of the solution for every ten bushels of wheat to be freed from the fungus.

J. F. HAUSEN.

SCIENTIFIC FARMING.

In a country like ours, where all the active work of cultivation must be done in less than half of the year, it is of special importance that no part of the work actually done should be made useless, or worse, because done the wrong way or at the wrong time. To get the best results we must do everything in the best way and to get and keep in that way, it is necessary that we have an accurate knowledge of the principles on which our action is founded. A good many men imagine, when they hear the word science used, that it means the use of long and learned words by men who have learned most of what they know inside schools and colleges, and are worth very little outside the walls of such institutions. This may be partly true of the book-worm kind of scholars. But science, correctly understood, is just accurate knowledge. It is the reverse of mere brute force, which along certain lines can still do a good deal of work, but is every day becoming of less value.

Plowing is one of the very simplest forms of cultivation, and our soil's are so easily worked that a half-skilled workman can poach over the ground. Even here the work done by a good man behind the plow is worth a good deal more than the kind left by the careless slouch. But if the work, no matter by whom done, is to pay, the man who can tell the reason why, is the man who will work with the greatest chance of avoiding unprofitable results. There is a letter lying before the writer, in which a Manitoba farmer says that "summer fallowing is one of the relics of ignorance." It is more than likely that the kind of fallowing done by the man who wrote this was of a kind that no well-informed man would expect good to follow. He has most likely turned over a naturally loose soil in a loose way and left it so. A more careful observer and sounder thinker would

have enquired why the reliable leaders of agricultural practice on and outside of our experiment stations, have such faith in fallow, and how they came to reach results so different from his own.

A more accurate insight into the processes of nature on his own wheat field would have taught this man that to get the best results from the seed we sow, we must work on reliable methods. There must be a thorough loosening of the particles of the soil, so that air and moisture can go all through it, and the roots travel freely in search of food. In the case of wheat, he would also have noticed that after being loosened by the plow and the frosts of winter, the soil needed to be compacted, so as to avoid the risk of excessive straw growth and late ripening, and also because in our climate it is important that moisture should be stored up to last over a dry spell, which would not be the case in a looser soil. He would also have observed that to loosen the surface of such land by means of a rake or harrow wherever that was possible would do a great deal to prevent evaporation through the surface and so save moisture to promote the growth of his crops. That and a good deal more of equal importance he could easily have learned by watching the processes of nature under his feet on his own land. And for the price of his fortnight's tobacco he could have bought a book that would have explained to him the principle of capillary attraction by means of which moisture moves in the soil, and the laws of plant nutrition in conformity with which his crops are fed and matured. He has never been inside a farmer's institute, in which he would have had the opportunity to hear men of deeper insight and more accurate habits of thought discuss their experience and the light they had got from it. His lack of thoroughness in thought and practice have hindered him from seeing more than half way into the meaning of most things he sees and hears and does, and he is looking to the ends of the earth for some new thing such as Alfalfa or Indian corn, or brome grass to save him from the necessary consequences of his own shallow, slipshod ways of working and thinking.

Thoroughness in seeing and thinking, followed by thorough work at the right time makes a scientific farmer. If the man who aims at this has had a good school education, so much the better for him, for a fairly trained person can pick up what he wants to learn twice as fast as one of equal capacity that has had no such advantages. But a man that has only learned to read and write needs only sufficient will power to make him, in the best sense of the word, a scientific farmer. It is certainly desirable that our younger men should have an opportunity, such as is now offered by the Minnesota School of Agriculture, of getting all the help possible to the profitable study of plant and animal life, and the processes of cultivation and cropping that will help them to make a success of their business. But it is quite possible for those who are tied nearly every day of their lives to their own homesteads to be in practice scientific farmers. Now is the time to prepare. Ex.

DRAINAGE.

(Continued)

In the climate of our Province, it is something to add ten days to each end of the season. Draining will effect this, at least, and will help in enabling us

to sow autumn wheat, if we wish it. Why we don't wish it, I cannot conceive; for every show at Montreal proves that it can be grown to advantage, and Capt. Campbell's farm at St. Hilaire, described in the September number, would convince an infidel. Of course, autumn wheat won't grow in a swamp; but drain the swamp, and then try!

"At Capt. Campbell's farm, when I arrived, I found the fall wheat had been threshed. The straw, which I measured was six feet four inches in length, and the wheat, which I weighed, passed 64½ lbs. per "struck" bushel. The quantity of land sown was 1.3 of an imperial acre, and the yield, taking the legal weight of 60 lbs. to the bushel, was 38 bushels, 3 pecks to the imperial acre, or 33 bushels to the arpent!

Some of the ears were 7 inches long, and so great had been the "tillerage" that one "stool", from one seed of course, had 31 stems—this, reckoning 36 grains to the ear, would give us the yield 1,116 from one seed!!!

The wheat was sold to Messrs. Evans, of Montreal, for seed: price, \$2.00 a bushel." v. p. 76, vol. 2., J. of Ag., Sept. 1880.

I do not think our draining here will ever be systematic work; that is to say, that whole farms, or even whole fields, will be drained on a regular plan at 25 to 33 feet apart. In the first place, we can't afford it, and, again, the summer's heat acts too rapidly to make such intensive work absolutely necessary. It would pay, I doubt not, in the long run, but I look upon it as hopeless, and therefore pass it by.

No, what we must look for is local drainage, wet spots, here and there, in corners, under the line of a wood, in sheltered places where the wind cannot reach: this is about all we can, at present, manage. And it must not be supposed that I by any means underrate the value of even this slight improvement. The effects of this practical work will, when its benefits are seen, give each one who tries it an appetite for the task. It is so interesting in itself, to say nothing of its profits, that when once a man begins draining, I have no fear of his halting on the road: if he begins with bushes, he will end with pines.

Whatever material we may use for our conduit, we should form, first of all, a clear idea of the way in which the water is to get into it. Many people have a notion, that each drop of water that falls from the clouds, has when it reaches the ground, to hunt its way through cracks and crevices, following the easiest route, in fact, until it falls into the drain at the top. Nothing can be farther from the truth. "Percolation" is not the way. It is all done by the force of "gravity." My readers all know that a sponge will hold a certain quantity of water, and no more. Let us conceive for a moment a sponge fully saturated: an additional drop is added from above: what happens? A drop oozes out from the bottom. So it is with drained land; but with this difference: the lowest drop, not being able to escape in any other way, is pressed upon by its superincumbent neighbours, and finds that the easiest mode of disembarassing itself of the annoyance is to divide itself in two, and go, one half into the drain on the right hand, and the other into the drain on the left. We know very well that, after a dry time, drains do not run until the body of earth between them is fully charged with water, and we now see the reason why they do not: gravity acts more easily in proportion to the depth it has to work upon; and this

consideration alone should put an end to all idea of "shallow" draining; it having been satisfactorily proved by experiment, that, in a heavy clay soil with alternate drains of 30 inches and 48 inches deep, respectively, the 48 inches drains always begin to run, after rain, at least 24 hours before the others.

This, incredible as it may seem to some, I know to be a fact; and it can only be accounted for on the principle we have just enunciated. In Essex, Eng., again, where very shallow draining, at frequent intervals, had long been practised, upon the introduction of deep drains (in the same fields) the shallow drains ceased to run at all, not even acting as subsidiary feeders to the deep ones, when the latter crossed them at a lower level: gravity acted on a column of water 48 inches high, more easily than on one of 18 inches.

It has often been wondered at by non-critical observers, that an "open ditch" will allow a pool of water to stand within a foot or two of its "lip"; and that no deepening of the ditch seems to have any effect on the retentive spots.

The solution of the question is, that, in retentive soils, all currents of water "puddle" their bed, and prevent the water rising up through it: this by the way.

So much for the theory of drainage. Next month we will attack the practice.

THE CULTIVATION OF CARROTS FOR FODDER

Sorts—Soils for Preparation of land—Drills—Hoeing—Harvesting.

(by I. M. Knight)

The carrot has long been looked upon as a favorite food for horses in the winter and also in the spring of the year. The area of its growth is extending, and thus it should be, for it is one of the most useful of field roots that we grow. It furnishes good food for any class of stock on the farm, and when fed to milk cows, there is no faint, or disagreeable odor in the milk as when turnips are fed.

Of the many varieties in cultivation, the White Belgian, White Vosges and Improved Half Long, are considered the best for a fodder crop. The last mentioned in particular has given enormous yields during recent years, they are a smooth, firm root and are excellent keepers. These varieties are all inclining to short. The long varieties go down so deeply into the soil, that they are not well adapted to field culture, as the labor of harvesting them is too great. (1)

The soils best adapted to the growth of the carrot are deep loams of a sandy texture, but some varieties will grow well on stiff clays. Black humus soils are also well adapted to their growth; but there is no soil in which carrots can be grown so easily as in those of a sandy texture, especially when they contain a fair amount of vegetable matter.

In preparing the ground, the work should be done or commenced the previous autumn; indeed, just after the previous crop has been removed. It may be gang-plowed and harrowed occasionally to stimulate the germination of weed seeds with a view of destroy-

(1) Nothing is easier to pull than Belgians, when the land has been well worked.—Ed.

ing them. It is of much importance to effect the destruction of weeds to the greatest possible extent before sowing carrots, as, owing to their slow habits of growth in the early stages of their development, they are easily smothered with weeds, unless prompt measures are resorted to for destroying them. As early as possible in the Spring, the ground should be run over with the harrow and the top crust broken, then the manure should be applied to the surface of the soil. Farmyard manure is the best manure for carrots, it contains all the elements essential to the luxuriant growth, and may be applied at the rate of from 15 to 20 loads of well rotted manure per acre. This should be plowed under and the exposed surface well worked so as to bring it in first class condition to drill. By using a spring-toothed cultivator and the harrow, this may be accomplished quickly and well. The distance of the drills apart may vary with the varieties, but for convenience of cultivation the rows should not be too near each other. It is preferable, however, to vary the distance between the plants than to vary the width of the rows according to the variety grown. From four to six pounds of seed may be used per acre, this will also vary with the width apart of the rows, about from 20 to 28 inches apart is the preferred distance, with drills say twenty-four inches apart, most varieties of carrots will grow very well if they almost touch each other in the line of the row towards the close of the season of growth. It is good practice to sow a small quantity of radish seed with the carrots as they come up very quickly and having wide leaves, mark the rows so that cultivation may be commenced as soon as the carrot plants appear above the surface and are not yet visible the whole length of the rows. The radishes may be pulled and used before they interfere with the growth of the carrots.

It is of great importance in growing roots, and especially carrots, that the hoeing should receive timely attention. The horse hoe should commence running as soon as the carrots are above ground, the hoeing along the line of the drills should begin at the same time. The weeds are thus kept down until the carrots get into the rough leaf, when the work of thinning may be commenced. The thinning should be regular, leaving as many plants as will nicely cover the space in the drills when they have attained their full growth. (1)

During the dry part of the season the horse-hoe should be run through the rows every week or ten days. The soil water rises from the sub-soil by capillary attraction and on coming to this loose layer of soil, which has been reduced to a fine state of division by the repeated shallow cultivation, the capillary action is interfered with and evaporation cannot take place to any extent through this loose layer, which acts as a mulch. Thus, the farmer may husband this supply of moisture and keep his crop growing steadily through a protracted spell of dry weather.

Nothing more will be necessary now until harvest time, and this work is somewhat tedious, but by plowing a furrow along each row this is greatly lessened. As the carrot is less subject to disease than most kinds of roots, and as it yields very large crops when properly cultivated, there is but little risk

(1) Thin, by chopping out with a 2 1/2 inch hoe, and single by hand.—Ed.

of failure in growing it, and the returns for the labor expended are generally satisfactory.

The Dairy.

AM I DAIRYING AT A PROFIT OR LOSS?

It really seems strangely absurd how very many so-called dairy farmers are dairying now a days. Foresight, push, intelligence, all seem lacking in their methods of producing milk.

What a great pity it is, more of our wealthiest and most intelligent farmers do not take up scientific dairying and interest themselves in it on a really profitable basis. With the few isolated examples which can be pointed out in this province of successful dairy farmers, we can realize how much is lacking in the methods of the average farmer, and it would seem that the object lesson afforded by the successful few, could not fail to excite and stimulate the unsuccessful ones to gain a greater knowledge of and insight into the whys and wherefores connected with profitable dairying.

If farmers would but realize how fully they are wasting their opportunities, when provided with a herd of cows, they go on day after day without having the slightest idea of what each individual cow is making or losing, as the case may be, in dollars and cents.

True, even within my immediate experience, a few have begun to think a little, and a wee small number have thought fit to have me test all their cows for them; yet again the large majority still thinking, and having gained my consent to test their cows, and having been provided with potassium bichromate with which to preserve their samples, no samples have been forthcoming in spite of much urging on my part.

The situation presents a more hopeless aspect, when we call to mind, that this testing of each individual cow, is by no means all that is required to ascertain the amount of money a cow makes or loses for her owner, but her food must also be taken into consideration, and a regular account must be kept for each cow in order to be accurate.

Farmers, your attention please. If you wish to dairy for profit, you must know what you are doing you must know exactly what it costs to keep each cow in your barn, and you must know exactly what returns in cash each cow gives you for her keep. Well then, first buy a little note book, in which to enter all your accounts with your cows, rule it off like this with the following headings:

No. or name of Cow.	Daily feed in lbs.					Total cost of feed	lbs. milk		%	Total fat.	Value of butter from fat.	Value of skim and butter milk.	Total returns.	Net profit.	Net Loss	
	Salage.	Hay	Timothy	Straw	Roots		Wheat	Oat								Other
Annie	10	8	6	10	6	4	28	20	21	4.5	1.815	51	05	56	28	

of course this form need not be confined to one side of the page, as in a look in, wide it will be found that the names of the cows, together with space for all the food stuffs, will take up the left

hand page and form the Dr. side, while all the returns from the cow etc., will take up all the right hand page and form the Cr. side.

Now buy some scales large enough and suitable for weighing all the food as well as the milk. Then buy a four bottle Babcock tester (nothing like having one of your own) and test your cows in the evenings, at least once or twice a month. A good plan is to buy a self-sealing jar for each cow, put the names of the cows on the bottles, buy 25 cts. worth of Potassium Bichromate (enough for 10 years,) and as much of this powder as will rest on a five cent piece dropped into each jar will preserve the subsequent contents for a month, if kept in a cool place.

Now, having secured all the necessary paraphernalia; weigh your food, and enter the various weights in your record book; feed your cows; weigh their milk separately night and morning, take a small sample, which must be a fair representative of the whole mess, generally procured immediately after milking the cow by pouring the milk backwards and forwards two or three times from one can to the other; and then dipping out about an egg cup full, pour it into that individual cow's jar and screw the cover on tight, and when there is already milk in the jar, wash the cream off which is adhering to the jar by a gentle rotary motion of the bottle. Test as often as you can, but at least once a month, and multiply the total number of pounds of milk by the percentage of fat in that milk, which gives the total amount of fat, to which, in order to ascertain the approximate amount of butter produced, must be added one-sixth of that amount. The rest can be easily be deduced from the figures already entered.

What revelations this plan of procedure would make! Yes, you farmers will be terribly surprised when you find out how many of your "boss" cows don't begin to pay for their board. But there is no need of discouragement, as it is right here where the benefit of all this extra care comes in. You will discover that some of your cows are paying well, some only a little and some not at all, so I advise you to fix a standard (in dollars and cents) for each of your cows to make for you in one year, start at let us say, twenty-five dollars net profit, and in the first year all those cows which do not come up to this standard, beef at once. Don't be mean enough to sell, as you may be sure if a cow doesn't suit you it is scarcely likely to suit anybody else; then the next year raise your standard to forty and then to fifty dollars per cow, until in a very short time you will find yourself with a herd of magnificent cows, and a big fat pocket book.

However, let it not be imagined to be an instant that it is only necessary to get rid of the poor cows; the poor feed, and the poor feeder must also be done away with, for seeing how much lower

the prices of dairy produce are now than a few years back, with proportionately low prices of grain feed stuffs, farmers must do their utmost to make as much profit now from milk selling at 65 cts. a hundred, as they formerly did when it brought them \$1.00. Farmers must make a study of raising the crops most profitable suitable for dairy cows.

Prof. Fleischman, the great German authority, says, "In the production of excellent and good keeping milk and butter, the best results may be most certainly obtained by using, for the winter feeding of cows, good hay and oat straw, with moderate quantities of beets and carrots, and with oats, wheat bran, and rape-cake."

This conclusion of the Professor's was the result of a great many experiments, but was no doubt arrived at before corn ensilage as a feeding stuff of any value had been brought to the perfection that it has now.

Ensilage must be the basis upon which to build up the daily ration.

For good sized cows such as Durham or Ayrshire grades of 1000 to 1100 lbs. I should propose the following ration per day divided into two feeds, 30 lbs. ensilage, 8 lbs. clover hay, 6 lbs. oat straw, 10 lbs. carrots, 6 lbs. oats, 4 lbs. wheat bran, and 2 lbs. oil cake, total cost about 25 cts.

Thus with all unprofitable cows weeded out, and a proper discrimination of the values of feeding stuffs, it seems scarcely possible, but that any intelligent farmer can make money at dairy farming.

H. WESTON PARRY,
Compton Model Farm,
Compton,
Quebec.

BEST USE OF SKIM-MILK.

There is little lost in food value of milk when its butter fats are removed from it. But there is wide difference of opinion as to what is the best use for the skimmed or separated milk to get the largest return from it. The practice of giving pretty much all the skim milk to calves, and making this nearly their exclusive feed for the first few weeks of their existence, is wasteful. In fact, skim milk should never be the exclusive diet of any animal. It contains all the caseine or cheesy matter that is contained in whole milk. It is, therefore, hard to digest, and can be best fed when some form of carbohydrates is fed with it.

Wherever skimmed or separated milk can be had near cities or villages, it can often be sold for more than its feeding value to any kind of stock, and that, too, without robbing the latter, which will thrive quite as well on something else. Calves and pigs we have found will do as well on oatmeal cooked to a thick porridge, and diluted with water and a little milk added, as they will on skim milk alone. If a teaspoonful of old process, sifted linseed meal is cooked with the porridge, it will make it much richer and give the calves the shiny, glossy coats that always betoken thrift. A very little oil meal is enough for a mess. It should always be added when much milk is given, as it prevents constipation and indigestion.

Those who keep poultry will find that there is nothing better for egg production than milk in some form, given moderately and with grain. It is best fed in curd squeezed as dry as convenient. For old fowl it may have a pinch of salt in it. But young chicks cannot eat even a little salt without danger. Care should

be taken to give no more at any time than the fowls will eat, for what is left over soon becomes offensive, and is liable to harbor the germs of disease. But what milk fowls will take readily is better for egg production than any other feed. It contains some phosphate of lime for the shell, but its main value is in its albumen, which is what more than half the white of the egg is composed of. To transmute the albumen of skim milk into eggs is always a paying business. The hens will do it if you will give them the chance. Unfortunately milk is scarce in winter on most farms. That explains in part why eggs are also scarce at that time. But skimmed or separated milk can, we think, always be afforded for fowls in winter. It is in winter less likely to cause disease. The skim milk is just as good if not better than whole milk for egg production. It lacks only the butter fats, which if given in excess may cause the hens to fatten instead of to lay more abundantly.

Where all other methods for profitably disposing of skim milk do not take the whole quantity, a good deal of the milk a cow produces that is used for making butter may be profitably fed back to the cow herself. If they require some training to get the cow to like skim milk, but if it is at first diluted with water, and its flavor changed by adding wheat bran to it, the cow will soon eat it greedily. It is excellent to increase milk flow, and if the cow is also fed grain she will make her milk as rich as usual and without losing flesh. Some better dairymen we know always make it a practice to dispose of skim milk in this way, and they hold that the cow can make better use of it than any other animal. But it is equally good for sows giving milk, and also for their young pigs. Feed thus the skim milk does not go to increase the dairy product and thus constantly add to the amount of milk to be disposed of.

In the glut of new milk which now generally prevails, so that prices are made lower than cost of production, the easiest way to remedy this evil is to provide for disposing of a part of the milk in ways that it will not affect dairy markets. If city milk pedlars could not buy skim milk for a cent a quart, or often less, there would be less opportunity for them to adulterate it before selling it. It is not easy to adulterate milk with water. But when skim milk can be cheaply had much of it is likely to be taken and mixed with new milk, defrauding not only the consumer, but equally injuring the milk producer, who finds the market glutted with inferior milk, so that the price of pure milk constantly declines. In most cases this is done by use of skim milk, for which the farmer gets less than he could by judiciously feeding it on his own farm.

Am. Ag.

MORE RESOLUTIONS FOR 1897.

There are a few more New Year's resolutions which might be well to consider.

FOR THE PATRONS.

1. To secure an aerator and cooler and use it all the year.
2. To make up your mind that it is in your own interest to deliver the very best milk at your creamery or cheese factory and that to knowingly deliver milk that is tainted or from sick cows, is worse than starving. In short, to

remember that even if you sell your milk right out to an individual factory, you are nevertheless working on a co-operative plan.

3. To lay in a stock of ice, even if you cannot afford a fancy ice-house.

1. To read and reduce your manual labor by increasing your brain labor and send in your subscription for "Hoard's Dairyman."

FOR THE FACTORYMEN.

1. To adopt the use of lime water in cleaning in and around the factory as neat as a pin and as bright as the rising sun, a practical object lesson to your patrons.

2. To secure plenty of ice and have the refrigerator always loaded and always dry, and never to ship butter that has not been cooled for 24 hours after working.

3. Never to grudge the expense of improvements even if your patrons and not you get the direct benefit.

1. To boil the skim milk before returning. Mr. Jensen, of Bolot, Kansas, has found this to carry its own reward, as it is impossible to do it with sour milk, and hence it turns out as an extra incentive to deliver the milk in good condition.

5. To economize by utilizing the exhaust steam for heating purposes.

6. To build two curing rooms, one a cellar with sub-earth duct, and to keep a record of temperature and moisture.

7. To encourage the patrons in reading and in having school house meetings for discussion of matters that pertain to the production of cheaper and better milk.

How many of the readers will make these resolutions and carry them out? "Hoard".

DANGERS OF BAD BUTTER.

There is one phase of the butter market which this association should try to do something about. The stuff called laded butter," which is produced in such large quantities in the West, is a more dangerous enemy to the legitimate dairyman than oleo or filled cheese. It consists of poor dairy butter accumulated by grocers until it becomes so rank that they can hold it no longer. Then it is shipped in all sorts of packages—nail kegs, shoe-boxes, etc. to the retailers' where it is put through a cleaning process, melted and treated with acids to get rid of its stinkiness, and then precipitated into cold water. But at no time is it subjected to a sufficient degree of heat to kill any microbes of disease it may contain. Next, it is churned with a little new milk or buttermilk, to give it a slight butter flavor; then put up in clean packages and shipped to city markets. The speaker described the residuum he had seen from this process—old rags, wool, hairpins, suspender buttons, and even the bones of mutton tallow. He considers this a most dangerous product, and the consumer ought to be protected against it. Enormous quantities are shipped to New-York, and it is impossible to detect it, for once upon a time it has been butter fat. The great State of New-York ought to do something to protect consumers against such a dangerous product.

F. E. Shaw emphasized the danger of this practice of purifying bad butter. He knew of one establishment where \$125,000 has been invested in a plant for this purpose. He would much rather eat oleo or butterine than such stuff as this.—"Country Gentleman."

BUTTER FLAVOR

There is an old saying that "What nobody understands everybody talks about." The multiplication table is never argued over, because it is a self-evident proposition. Thus question of the fine flavor in butter, what it is, what causes it, and how it is imparted, is receiving a great deal of attention in these late years.

Chemists, microscopists and bacteriologists, as well as practical manipulators of milk and cream have been studying it very keenly. At the best it is a very elusive factor, and for this reason is there such a diversity of ideas upon it.

There are various flavors sought for to a greater or less extent in the market. First, there is the sweet cream flavor, so much liked in aristocratic circles in Europe, and which is becoming quite popular in wealthy clubs and families in this country. This flavor is what most people would call a flat, lifeless flavor. Next, there is the ripened cream flavor, which in its highest expression rules all the best wholesale markets in the United States. This sort of a flavor depends upon the following conditions:

- (1) Milk and cream as free from all dirt, dust, salt, or vegetable flavors as possible. The place to start towards securing this desirable flavor is in the care of the cows, care of the milk, and the character of the food given the cows. Here is where neatness and watchful care of stables, health of cows, ventilation, sunlight in the stable and many other things play so important a part. Right here, is where so many patrons of creameries fail, and because they do not understand these things, they destroy the value of the butter made at the creamery they patronize.

- (2) The second condition lies in the length of time the cow has been in milk, together with the fact whether she is three months or more in calf. Stripper's milk is deficient in fine butter flavor. It is noticed that when the cow has passed, say three or four months in gestation, that the finer flavoring elements of the fat are lacking. For this reason it is thought that they are drawn off through the economy of nature in the creation of the brain and nervous system of the offspring. Lacking these essential elements of flavor and nerve growth, strippers milk is found to be unfit to feed infant children, which is not the case with farrow cow's milk. For these reasons it has been found in practice that it is well to have a few cows in the herd coming fresh every month in the year, as their milk greatly improves the flavor.

- (3) The proper care of the milk as soon as drawn from the cow, care being taken to rigidly exclude it as soon as possible from all injurious flavors. Here again is where the soul of neatness must preside at every step. The milk must be taken from the barn as soon as drawn. If deep or open setting is practised, it must be kept in pure water or air, and the cream must be equally well guarded.

- (4) The final step taken is in the ripening of the cream. To produce the finest market flavor, the cream must pass through a process of lactic fermentation, as well as bacterial development, all of which acts on the casein or cheese element in the cream, and if carried to perfection leaves the right flavor in the butter fat.

It is a difficult thing to describe in words, the right condition of the cream when properly ripened. To know this, one must study true experience. No man

can teach in words the right touch in violin or piano playing. The pupil must learn that by hearing the right tone, and putting himself into practice to obtain it.

A few signs of well ripened cream may be given as follows: As the cream approaches the right churning stage, it will grow thicker and will become thoroughly homogeneous in character. It will have a smooth, velvety appearance. If it is lumpy it has passed beyond the right stage.

All this ground that we have gone over is to secure one thing,—the right flavor. It should be understood by the farmer everywhere, whether his wife makes the butter or whether he takes the milk to the creamery, that nine-tenths of the success in securing fine flavor in the butter depends on him. If he goes wrong, no power on earth can make fine butter from his spoiled product.

It is the right flavor that puts the price on butter. Flavor constitutes nine-tenths of the value, and because of its importance, we must bend every effort to create and maintain it.—"Hoard."

The Poultry-Yard.

A Seasonable talk—Popularity of May chickens—Get early chicks from robust stock—The proper care and management of chicks.

(A. G. Gilbert).

The early part of the month of May should see a large number of chickens hatched out by the farmers, who use the faithful hen as an incubating medium. The month of May is certainly by the great "chicken" month of the year. There is a general and strong impression among farmers that no chickens thrive as well as "May chickens", and they are not far wrong. Some of the causes which lead to this conclusion are the genial yet invigorating temperature; the young, tender and rapidly growing grass and bright sunshine so general, in this charming month. There can be no doubt that chicks, "which grow with the grass", make more satisfactory progress than others hatched out by hens at any other time of the year. There are certain expert breeders who hatch out some of their exhibition and breeding stock for spring of the following year at a later season, but it requires expert handling of and extra care to keep such brood stock growing during the winter season. Experiment, time and again, has proved that the so called "harvest chicks," have been a source of anxious care and doleful failure, rather than robust specimens. The writer has had late hatched pullets come through the winter in fairly good condition, and with the advent of spring weather, make growth. But it would not pay a farmer to do the same, unless he had all the conditions favorable.

EARLY CHICKS FROM ROBUST STOCK.

What is the farmer to do then? Get his chickens out early of course. He will find that with the ordinary resources at his disposal, eggs set in April so as to bring chicks late in the month, or early in May, will give him the most satisfactory results. And in order to obtain the desired percentage

of chicks it will be necessary for him to have his stock in robust health. It requires intelligent care and management to make hens lay well all winter and in spring time breed strong chickens from their eggs. It can be done and is done. But it can never be done from eggs laid by hens which have been OVERFED DURING THE WINTER, or which have come out of winter quarters OVERFED. A general complaint in Spring is that early eggs do not hatch well, owing to want of fertility, thin shells, etc. Both are due to overfat condition of the breeding stock. It is quite possible to have your laying stock productive in winter and yet have their eggs fertile in spring. Space will not permit of my going into details of management, so as to obtain this desideratum, on another occasion. Suffice it to say, that half the failures in obtaining eggs in winter, most of the diseases, thin shells, etc. are due to overfeeding in order to stimulate the hens to prolific laying. In other words most people over-reach themselves in trying to get too much.

SOME THINGS THAT CAN BE DONE.

Probably by the time this letter reaches your readers it will be too late to indulge in retrospect as to winter or spring management. It will probably find them with a large number of chicks out, or coming out and some hints as to proper food, care and housing may be timely and useful. Some of the ground may have been gone over before but from the number of letters received asking for information as to "proper management," it will bear repetition. Let the following treatment of the young chicks be practised and there will be few losses:

After hatching out, place hen and her brood in a lathed coop in a warm sunny corner on grass, if possible. The object in confining the hen is that it permits the better feeding of and caring for the chicks. When the hen is allowed to run at large with her brood, the active exercise will take the flesh off the chicks as fast as your careful feeding will put it on. Confined to the coop she broods her chicks better and flesh can be put on them easier. The chicks should be fed a little and often and no food should be allowed to remain on the boards, or trough, to sour. They should be fed only what they will eat up clean or heartily. The best food for chicks just out is stale bread soaked in milk and squeezed dry, stale bread crumbs, granulated oatmeal or boiled rice. Continue for eight or ten days when a cheaper form of mash composed of cornmeal, shorts, stale bread, oatmeal etc. may be given. Let all be cooked well. Many hundreds of chicks are sent out of the world by means of cornmeal simply mixed with cold water and so fed. It is easy but not conducive to longevity. After fourteen days feed whole wheat in small quantity at first. In the first ten days fresh bone broken in small pieces may be given, afterwards in greater quantity. Keep the crops scrupulously clean, give milk and water, and watch the youngsters grow.

At this juncture, some one says, "I have never taken half so much trouble with my chicks." Perhaps not and as a result lost nearly if not more than one half. Another says: "I simply let the hen run about with her chicks. She knows how to care for them. And the

result! Chickens which come to market all sinew and bone and little or no flesh; such chickens as make three and a half to four and a half pounds per pair and which the poultry dealers in Montreal will tell you are NOT WANTED under any circumstances.

If any person is under the impression that they can produce a superior quality of poultry for home sale, or shipment to the English market, without effort and a thorough knowledge of how to do so they are labouring under a hallucination. It has been said in the columns of this paper time and again, that success in egg production and poultry culture can only be attained by the exercise of the same intelligent energy, as is applied to other departments of a well managed farm. And what has been said is repeated with emphasis.

ARTIFICIAL INCUBATION.

Practised in Egypt—Pliny, &c. on it—
The Ostrich—Ovens, &c.

(By M. Gagné.)

An author has written somewhere that the acorn comes from the oak, and this proposition is true, provided that we do not assign any priority to the acorn. And so may we say, the *hœ* comes from the egg, and as we cannot hope to have many eggs without hens, nobody will deny the importance of a study on the best means of providing good layers.

The ordinary process has its good side; but it being admitted that the aim proposed by a poultry keeper is egg production, it is evident that it must be of more advantage to hatch eggs artificially, when we reflect that all sitting hens cease to lay.

Nobody will contest our proposition, that all sitting hens will cease to lay; and it is to obviate this loss that we have at times intrusted this function to capons, that discharge it very well. We have not been content with that, we have sought to replace natural warmth by artificial warmth; and why not? Does the free-roving ostrich sit on her eggs? Does she not entrust them to the sun-warmed sand of the desert? (1) This manner of replacing the mothers is no novelty. For centuries, in Egypt, they have hatched their chickens in ovens. The art of hatching eggs artificially is one of the most curious of inventions. It is like a reproduction of the most recondite operations of nature. But we can easily account for this discovery in a country so warm and so dry as Egypt, where the inhabitants have every day before their eyes many species of animals that hatch their eggs

(1) "The American Ostrich" is the title of a paper by W. M. Gray in the February "Cosmopolitan," which will probably convey to the average reader some sensations of surprise. Many may not have known previously that there were ostriches in any number outside of Africa, yet here we find there are several ostrich farms flourishing in California, with hundreds of flocks. And the falsity is shown of the old slanders about the ostrich leaving her eggs to be hatched in the sand, and contenting herself with a covert for her head without care for her unconcealed body. The ostrich pair, male as well as female, are assiduous in sitting on the eggs. Ed.

in the sand, by the warmth of the sun alone.

From this fact to the idea of an artificial imitation of the process, there was only a step. Indeed, we find a few words about this industry of the Egyptians in Aristotle and Diodorus Siculus. There is no mention at all of it in Herodotus, elsewhere so exact in the description of all he saw remarkable in Egypt. Whence, we must conclude that this art was born in the interval between the writings of Herodotus and Aristotle. To day, this art is still flourishing in Egypt, owing to the great abundance of fowls with which that country is supplied.

The eggs for hatching seem, according to Pliny, to have been placed at first in hotbeds of manure, where the fermentation excited a mild and regular warmth; a process employed since by Réaumur, but in the time of Pliny the naturalist, they substituted the heated ovens, in which the eggs were placed on straw beds, and these ovens named "mamals" still exist. They are commonly met with in twenty or twenty-five villages, and consist of many systems of rooms, built of very strong masonry, nearly entirely sunk in the soil, and which are reached only by a long passage, separated by partitions, dispositions marvellously well contrived to obtain that perfectly equal temperature, which is necessary for the development of the chicks.

The Egyptians having but simple methods of heating, it was by the mass of masonry that they were obliged to regulate its effects.

Each system is composed of an upper room, communicating between by a central opening, and with a gallery by other openings.

They place 6000 or 7000 eggs in the lower room on the straw, and in the eight or ten first days only, they make a fire in the places reserved at the opening of the upper room, by burning the fuel of Egypt, i. e. lumps composed of cow and camel dung and straw.

The smoke passes through an opening in the upper room and in the one at the top of the corridor; the lower room is warmed by the transmission of the heat of the upper story. (1) Three of four hours of this heating mode are sufficient for each day. Many times a day they move the eggs, to equalise the temperature.

About the tenth day, after having visited the eggs at day break and rejected those that do not seem fertile, they put them all in the upper room, where the same care is given; and at last, about the twenty first day, the chickens are hatched, and are handed over to the proprietors of the eggs.

Before letting the chickens out of doors, they are placed in a central gallery, to become accustomed there slowly to the outside temperature.

The art of conducting the "mamals" has remained concentrated in one village, that called Beron, in the Delta. Every year, the people of this place, at the beginning of the autumn, wander over all Egypt to prosecute their trade, a business that evidently demands great practical experience.

For the price of their care, they take all the chicks hatched above the two-thirds of the eggs that are entrusted to them, deduction made of all eggs that do not prove fertile at the time when they inspected them. (In subsequent articles we will treat on the subject of the fertility of the egg.)

(1) The reverse, one would think, as heat ascends.—Ed.

This industry was unknown in Europe until Réaumur tried to introduce it into France.

(To be continued)

FATTENING TURKEYS IN RHODE ISLAND.

(Extract from address by Samuel Cushman, Pawtucket R. I. at New-York Farmers' Institute, Middleville.)

In the fall they are fed whole old corn. Clear new corn causes bowel trouble. Mr. Tucker at this time used to feed new and old corn mixed. At this season the sexes separate and the gobblers run in one flock and the females in another.

When fattening few use dough. We know some who do and put a little extra power in it. Most feed all the whole corn they will eat three times per day. No cooping is necessary. The fall feeding causes them to roan but little, they remain quiet and sun themselves or rest much of the time.

Those not to be killed should not be fattened as it is an injury to them.

CATCHING TURKEYS FOR SLAUGHTER

(Extract from address by Samuel Cushman, Pawtucket R. I. at New-York Farmers' Institute, Middleville.)

Catching turkeys for slaughter is a vexatious and perplexing task for the beginner, and one not always unattended with anxiety to even the experienced raiser. It takes some experience and skill to drive turkeys into a barn and secure them. When enclosed they may fly about, pile up on each other and sometimes many are injured and a few smothered. Mr. Miner of our section has, leading out of the back of his catching shed, a low pen or passage way through which his turkeys find their way. After they become accustomed to this means of escape, they are easily driven into the shed. When they are to be caught, the exit is closed, and they find it out too late to turn back. As the pen is low and dark, they can not fly about or pile on each other. They are caught by the leg, secured without a struggle, and when dressed are free from bruises.

A FEW WORDS ON COLORED DORKINGS. (1)

By John Lawrie, Malvern, Ont.

Mr. John Lawrie, of Malvern, is a son of James Lawrie, the well-known breeder and importer of Clydesdale horses and Ayrshire cattle. Mr. James Lawrie has also been a well-known importer and breeder of colored Dorkings, and in this respect the son has followed the footsteps of his father, and so successfully that recently at many leading shows birds of his breeding have secured the lion's share of all the prize money. In 1895, at the "Ontario," a Dorking pullet of Mr. Lawrie's raising was pronounced by competent judges to have been the best ever exhibited in Canada. He has also won good prizes (firsts and seconds) at the great poultry

(1) Our favorite breed. We kept "Colored Dorkings" as long ago as 1846, and never have found their equals for white flesh, full breasts, and quiet habits.—Ed.

show at Madison Square Gardens, New-York. Mr. Lawrie takes great pains to keep his colored Dorkings perfectly pure, and will not allow fowls of any other variety or breed to come within half a mile of his favorites. Mr. Lawrie is also, like his father, a successful breeder of Ayrshires, and his herd is considered one of the best in the county of York. Mr. Lawrie is an important office-bearer in several local agricultural societies, and also of the East York Plowmen's Association.

In my opinion, of all the varieties of fowls, Colored Dorkings are the best for farmers. They are good layers, and with their large body, their white skin, and their delicious flavor, they are one of the best, if not the very best, variety for table use.

The Dorking hens make grand mothers, and the young chicks mature early, and those farmers who wish to raise poultry to sell as broilers cannot do better than to introduce the Dorking blood into their flocks.

If they only knew it, farmers have better facilities for keeping poultry than any other people—not merely poultry for general use, but poultry for show birds; for it is very easy for any farmer to provide an unlimited run for his fowls in fine weather, and to have a suitable house to protect them from draughts at night, and on days that are wet or stormy.

My own henhouse answers the purpose to the letter, and it is not expensive but is such as any farmer can easily provide himself with at a very small cost. It was merely a common shed opening to the south, which I closed up. I fitted two windows into the new south wall, and by means of wire netting, I divided the shed into three compartments. I have had small doors made entering into each compartment, and I can thus easily open one pen or more at a time as I choose, and so let the fowls have free access to the barnyard on fine days during the winter, where they will keep themselves busy scratching for food, and thus have plenty of exercise, something that is very essential to successful poultry-raising.

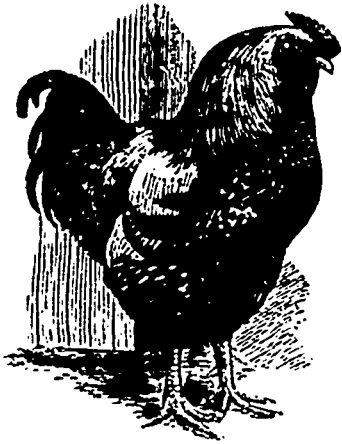
The principal food that I use is clean wheat, with an occasional feed of meat of some kind. I always supply plenty of pure water, and grit. I keep a sharp lookout for vermin of all sorts, knowing that these are the worst enemies of the poultry-keeper. By a liberal use of whitewash in which some vermicide, such as carbolic acid, is mixed, and by occasionally dusting the birds with insect powder, I am able to keep my fowls free from lice.

I feel very certain any farmer who desires to do so may succeed in poultry-keeping. It only needs care, attention, and a study of the habits of the fowls you keep. And if you give them this care and attention, I am sure you will be able to make money out of your poultry—not only some money, but a good deal. Ex.

A TYPICAL SILVER LACED WYANDOTTE

The illustration above clearly portrays the general conformation of a premium winning Silver Laced Wyandotte cock, and conveys some idea of the great beauty of plumage. The cock won his ribbons at the annual poultry show of the Massachusetts Poultry Association, held at Boston this year, and was considered one of the greatest poultry shows ever held. First pre-

mium was also awarded later at the New-York Show. The owner, W. B. Barton of Berkshire County, Mass., refused \$50 for the bird. Mr. Barton annually raises about 200 fowls which have the run of his large farm during the summer; during the breeding sea-



Prize Winning Silver Wyandotte Cockerel.

son the fowls are kept penned. Mr. Barton truly says, "It costs no more to raise a premium winning pure-bred than it does a scrub."—*Farm and Home.*

SIX TONS OF DUCK PER ACRE

WITH WHITE CHICKENS THROWN IN.

What a Rhode Island man is doing.

PART I.

Mr. George Pollard of Pawtucket, R. I., has been in the duck raising business for the past five years, and, last season, raised 5,000 ducks, and 800 chickens. His success in duck raising since the start has been greater than that of most beginners, and he now has the business on a substantial and profitable basis. He had been a buyer of live poultry for the market for years, and raised fowls to a considerable extent, but did not attempt to raise ducks extensively until a man in Pawtucket, having an extensive plant for raising ducks, decided to give up the business and sell out. This man, who was formerly a bookkeeper, after a few years' experience on a farm, built a dwelling-house, barn, a poultryhouse, 160 x 15 feet, and other buildings. His idea was to make a living from 500 fowls kept in this building. After a trial of this plan for a few years the hens were discarded and duck raising was taken up. After four years' experience in raising ducks, he was obliged to sell the place at a great sacrifice. Mr. Pollard bought it, together with the breeding ducks, incubators, etc., on the place, made many alterations and commenced the business. The first season he secured but a very small per cent of fertile eggs. The vitality of the stock was so low that the young ducks that were hatched were weak, and had hard work to live, and were not reared at a profit. This breeding stock was then put out on a farm for the summer where they had free range and every liberty, in hopes that they would improve and do better when brought back in the winter; but as the results were no more satisfactory the following season, they were all killed and new, vigorous stock was procured. The third season's operations were more of a success, and a fine lot of ducks were raised, about 3,300 in number.

The fourth season, Mr. Pollard was again troubled by too many infertile eggs and by those having weak germs; therefore, he secured a farm on which were a pond and numerous marshes built a duckhouse, and placed his breeding ducks thereon. The eggs incubated that season were all laid by the ducks that were on this farm. It is now five years since Mr. Pollard commenced rearing ducks artificially. During this time, he has made many changes, has doggedly studied the problem and the result last season, 5,000 ducks raised from 100 laying ducks and 40 or more drakes, as well as a good many eggs sold for hatching, shows that he has secured a good measure of success.

THE FIXTURES; A MODEL BROODER

On the place was a large two-story house 160 feet long and 15 feet wide, with slanting front and back and much glass in the front of both stories. The lower story was intended for keeping hens and the upper had later installed ducks in the lower part and given up the use of the wind-exposed loft, with its many windows, for brooding purposes. By tearing out some of the elaborate fixtures to save labor, and enlarging the pens, the lower part of this house made very good quarters for laying ducks. The shape of this house, however, should not be followed as a pattern. A slanting front and back are undesirable on account of the liability of the windows to leak during a rain storm, and because the back remains wet longer after a storm. Snow also lodges on these slanting windows, and must be brushed off after a snow storm.

A brooderhouse 90 feet long by 13 feet wide had been built on the ground, when duck raising was taken up, and although this building has a slanting front, it is, in other respects, admirable; and, after certain changes made in the original brooder cover by Mr. Pollard, it seems to be as well adapted to its purpose as any piped brooderhouse that I have ever seen. Instead of a system of hot-water pipes under the brooder covers and above the chickens, the pipes are sunk in a wide trench. Over this trench are the brooder floors, and projecting through these floors and extending nearly up to the brooder cover, are three 1½-inch pipes through which the heated air from the trench arises and escapes close under the top of the brooder cover. These pipes are several inches apart, and in one end of the brooder, and the brooders are large and open in front, with the exception of the usual curtain. The brooder floors are heated somewhat, and they extend outside of the brooder. This gives a combination of bottom heat with hot air under the brooder cover. If the air escaping from the pipes is too hot, the chicken simply gets farther away from them. The warm floor which extends outside of the brooder enables them to keep warm when resting on this floor and breathing the cold air outside the brooder. The trench confines the heat so that the building is heated very little, as most of what there is goes first into the brooders. In running the furnace or boiler for this arrangement, the operator must simply see that there is enough heat, and the chicken will do the rest. If there be too much heat, the chicken can move away from the pipes toward the cool end, or go out from under the cover where the floor is warm but the air is cool. With most brooders, where the bare pipes are over

the chickens' backs, they are either too hot or too cold much of the time, and where the brooder boxes are closed in front, there is as much danger of getting the brooder too hot as of running it too cool. In either case, the chicken has to stand it, he cannot help himself. Doubtless more harm has been done by too hot brooders and overheated houses than by the brooders being run too low. This arrangement seems as free from these objections and as near nature as anything I have seen in the line of a brooder heated with a hot-water system. As is the case with certain single lamp brooders, the chicken or duckling does the regulating to suit himself, and can keep himself comfortable if there be plenty of heat. He need not bake or suffer from extremes of heat and cold.

In this house, the pens are 5 x 10 feet with a passage-way along the back of the house. Mr. Pollard has put 150 ducklings into each pen, but prefers to put 75 in a pen 4 x 10 feet. The outdoor run connected with each brooder pen is 40 feet long. In pleasant weather in the winter, the chickens or ducklings are given a run in this yard once each day. The brooder covers are placed at different heights to accommodate different sizes of chickens. The difference in these graduations is about two inches. The pipes through which the hot air escapes into the brooder are protected with netting to prevent the chickens getting against them or on top of them where the covers are elevated. It takes about a ton of coal per month to run the boiler when the house is in full operation. Two men are employed the year through besides the picker.

Not only have 5,000 ducklings been turned out of here, but 800 chickens as well. The chickens were, however, transferred to the farm as soon as they were independent of artificial heat and shelter, but the ducks were not only hatched, but grown and killed on this place. The amount of land occupied by the dwelling, barn and poultry buildings, and yards is not over two acres.

Mr. Pollard says that the foundation of success in this business lies in the breeding stock. More failures occur on account of the breeding stock being weak than from any other cause. The best of stock, unless kept properly, will soon get weak and worthless. When mating breeding ducks in November, he provides a drake for every five ducks. Later in the season, about the last of May, a drake should have as many as six or seven ducks. For breeding, he prefers ducks and drakes in their second year to those raised the same season, although a part of those used are young stock. No ducks are kept, however, longer than two or three years. No whole grain is fed the breeding ducks. He gives them a mixture composed of three parts of wheat bran, three parts corn meal and one part beef scraps. One part of a cheap grade of flour is also added to hold the mass together. This makes it scatter less and prevents much waste. It is mixed with hot water in winter to take off the chill, but not to cook it. Sound cabbage is also bought and fed, as well as boiled turnips and clover. Crushed stone or grit, the same as is fed to hens, is kept by them all the time, as well as crushed oyster shells. In cold weather, the ducks are housed at night, but they are invariably fed out of doors every day in winter. When snow is on the ground, a place is cleared in front of the house for this purpose. Eggs are not secured in any

number until December. Although the ducks are allowed the run of their yard during the laying season, nine tenths of the eggs are laid in the house. They do all their laying by 10 o'clock in the forenoon, (1) after which they are given free access to a pond or swimming place. Mr. Pollard has tried nest boxes and stalls as nests, but finds them of no advantage. The ducks are liable to rush from one end of the room to the other and the whole flock are liable to go slap bang against them and pile up in them. If they happen to be in their course. The house floor is covered with planer shavings, and the ducks make their nests right on the floor, and less eggs are broken or lost than under any other plan followed. Planer shavings suit Mr. Pollard best for bedding, though they want the value of the manure. 2) Cotton duff is excellent, and is, also, of value as manure.

RUNNING THE INCUBATORS.

Usually, the first incubator is filled in

good and the germs strong, the fertile eggs will hatch if the temperature is anywhere near right.
SAMUEL CUSHMAN.
Rhode Island.

Manures.

THE NON-AVAILABILITY OF PHOSPHORIC ACID IN FINELY GROUND APATITE.

— By —

Frank T. Shutt, M. A., F. I. C. Chemist, Dominion Experimental Farms.

In the February issue of the Journal attention is called to the insoluble, and consequently unavailable, character of ground apatite. This is a question of no little importance to agriculturists, and a concise statement as to what has been done towards obtaining accurate knowl-

Moisture	100
*Tricalcic phosphate....	58.48
Insoluble rock matter	17.33
Carbonate of Lime, etc....	24.10

	100.00

* Equivalent to 26.79 per cent phosphoric acid (P. O.)

Experiment A.—5 grams of phosphate were placed in 150 c. c. of water through which carbonic acid was slowly passed for 3 hours. The whole was then filtered and an estimation of the phosphoric acid in the filtrate made. This resulted in showing that phosphoric acid equivalent to .15 per cent of tricalcic phosphate had been made soluble by this treatment.

Experiment B.—5 grams of the phosphate were heated in a platinum dish in a gas muffle furnace for three hours to a bright red heat. The cooled mass was treated with 150 c. c. of water through which carbonic acid was passed as in the previous experiment. The whole was then filtered and an estima-

analysis it was found that by this treatment phosphoric acid equivalent to .05 per cent tricalcic phosphate had been converted into a soluble form

From these experiments the following conclusions may be drawn :

1....That the finely ground mineral phosphate is soluble only to a "very slight extent" in water containing carbonic acid—our experiments showing only one five-hundredths or one per cent. In the soil such a solvent action undoubtedly takes place, but our experiments would indicate that the process is an "extremely slow" one.

2....That previous calcination appears to render the phosphate "slightly" more soluble in carbonic acid water. As already stated, the ignition of the tricalcic phosphate could bring about no chemical change. This slight increased solubility is therefore due to (1) a physical change induced by the heat, or (2) to the action, at the temperature of calcination, of some impurity present in the phosphate. The conversion, however, is so slight (by our experiments, about one-half of one per cent.) that it cannot be considered to have any commercial importance.

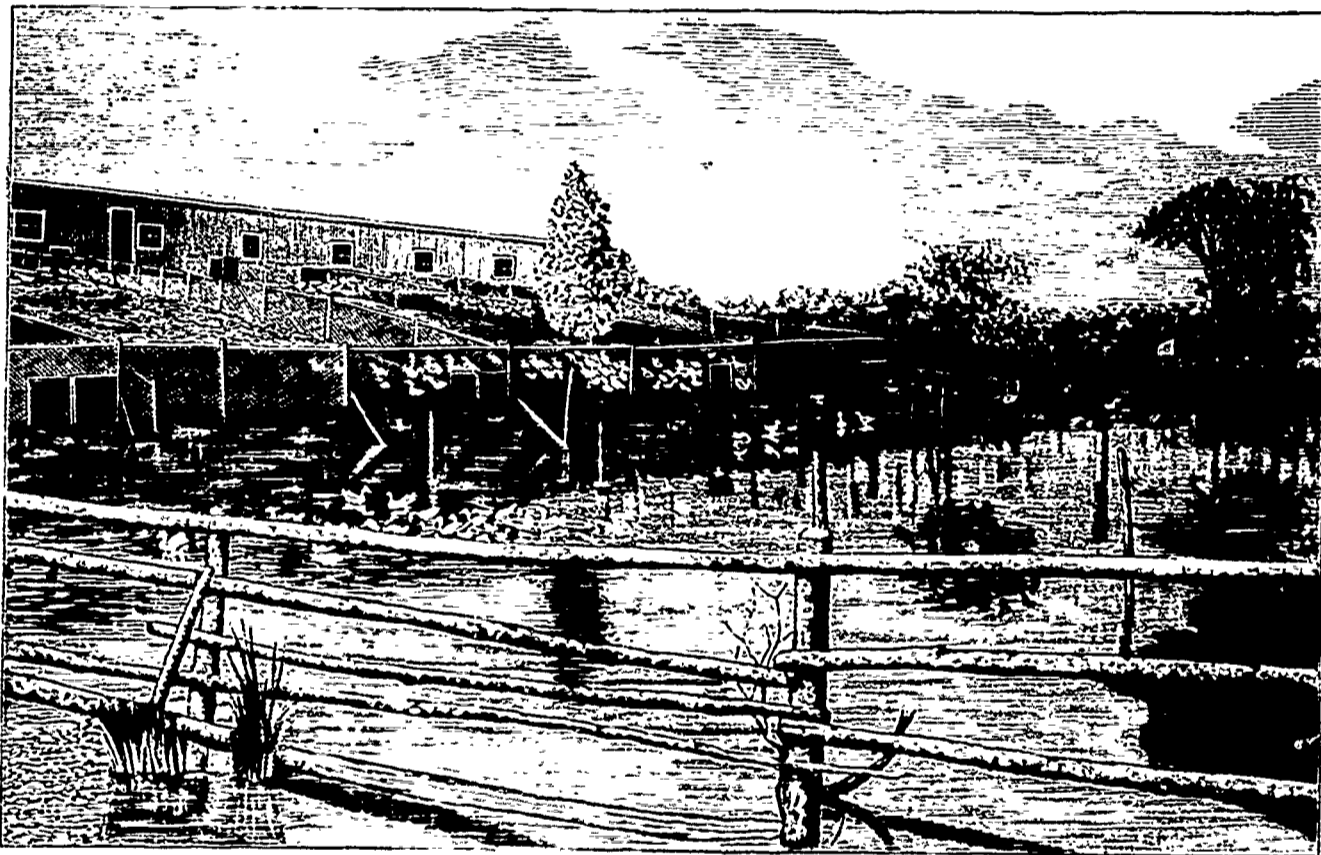
3....That it is evident that the calcined phosphate is not soluble to any extent in ammonia citrate solution, showing that very little, if any, phosphate containing "reverted" phosphoric acid is formed by simple ignition.

FINELY GROUND APATITE COMPOSTED WITH ACTIVELY FERMENTING MANURE.

On the 29th. April, 1896, finely ground mineral phosphate was added to strongly fermenting manure (composed of equal parts of horse and cow manure) at the rate of 50 lbs. of the phosphate per ton of manure. After a thorough mixing of the two the sample was put into a wide mouth jar capable of holding 5 gallons. The mouth being covered with two thicknesses of stout canvas. The jar was then placed in the middle of an actively fermenting manure heap and allowed to remain there till August 20th.—practically four months. The weight of the sample before and after experiment was taken and very careful analysis made to determine the percentage of available phosphoric acid in the manure on the dates April 29th. and August 20th. This latter was affected by means of a one per cent. solution of citric acid—a solution which has been shown by Dr Lyster to have a solvent action approximately equivalent to that of the acid exudation of plant rootlets.

To omit many of the data which are unnecessary for our present purpose, we may summarize as follows: During the four months rotting, the sample was reduced to about one-fourth its original weight. This was in part due to the evaporation of moisture, but analysis also showed that in a large measure it was due to destruction of the organic matter—a process always going on in fermenting manure. It is evident, therefore, that all the conditions which might be supposed to be favourable to decomposition of the phosphate were present.

According to the method already referred to, the manure at the close of the experiment contained .237 per cent. of available phosphoric acid, calculated to the original amount of manure. A check sample, consisting of the same manure and fermented under the same conditions and for the same period, (but without the addition of the mineral phosphate) gave, when calculated to the original amount of manure, .241



PARTIAL VIEW OF MR. POLLARD'S BREEDING HOUSE AND YARDS.

January, and the last in the latter part of July. He has six 600-egg and one 300-egg Monarch incubators in his house cellar. As he runs them himself and is a careful man, he is not afraid to sleep over them and likes to be able to run down to them at any time. In his slippers. In the middle of winter, instead of having to go to a building located away from the house. He has, however, over the lamp of each machine, an automatic sprinkler that will open and drench the machine until turned off in case it does get on fire.

He estimates that he gets about 50 ducks from every 100 eggs put in the machines, not counting the first two and last two hatches, which do not usually turn out so well. Of the early lots of eggs, sometimes 50 per cent are fertile and of these about 50 or 60 per cent hatch. He runs the machines at 102 degrees, and says "of course they vary some, but if the stock is

edge on this subject at the Dominion Experimental Farms will no doubt prove interesting to our farmers, orchardists and market gardeners.

The investigation, begun during the earlier months of 1893, at the direct instigation of the Hon. the Minister of Agriculture, sought to ascertain (1) the degree of solubility in water of finely ground apatite, before and after ignition; (2) the solubility of the phosphoric acid in compounds resulting from the fusing together of finely ground apatite and certain chemicals, e. g.: carbonate of potassium, sulphate and bisulphates of potassium, sodium, etc., (3) the solubility of phosphoric acid in finely ground apatite after this material had been composted with strongly fermenting manure.

In the present article we shall only speak of the results obtained from the 1st. and 3rd of these lines of research.

All the experiments, the details of which are now to be given, were made with a finely ground apatite, found on analysis to have the following composition:

tion of the phosphoric acid in the filtrate made. The data obtained showed that phosphoric acid equivalent to .15 per cent of tricalcic phosphate had been converted into a soluble form by ignition and the subsequent action of carbonic acid dissolved in water.

Experiment C.—In general principles this is a duplicate of Experiment B. 1 gram of the phosphate was heated for five hours, and treated with 500 c. c. of water through carbonic acid was passed at the rate of two bubbles per second for three hours. The whole was filtered and the phosphoric acid determined in the filtrate. Phosphoric acid equivalent to .18 per cent. of tricalcic phosphate had become soluble.

Experiment D.—1 gram of phosphate was ignited as in experiment C. After cooling, the mass was thoroughly moistened with ammonium carbonate to reconvert any caustic lime formed by the calcination into carbonate, and gently ignited. The mass was treated with ammonia citrate solution in the usual way. This would bring into solution any "reverted" as well as water-soluble phosphoric acid present. Upon

(1) In England, laying ducks are not let out in the morning till they have laid. Ed.

(2) How? Ed.

per cent. of available phosphoric acid. These figures may be considered as ideal, since the difference is such as might be accounted for by the usual errors of experiment. Consequently, we may presume that, "available phosphoric acid is not produced from the finely ground apatite during the process of fermentation with manure"—in other words, that such a plan does not in any degree increase the agricultural or fertilizing value of this mineral.

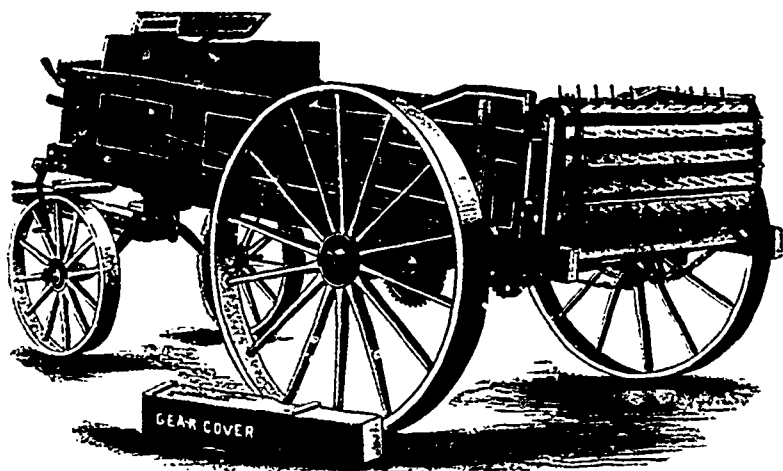
All our work indicates that no advantage would accrue from the use of the crude mineral phosphate, even though finely ground. What we must look to is furnishing our crops with food in more or less immediately available forms; in such a practice only can success be expected in these days of progress and keen competition.

THE MAKING AND CARE OF FARM MANURE

Different sorts—Preservation—Plaster—Dung-heaps—Wood-ashes—Composts.

By J. W. KNIGHT.

It is to be regretted that in this advanced age of agricultural science we



MANURE SPREADER OR DISTRIBUTOR.

and so many Canadian farmers who are considered intelligent, so careless as to their methods of handling the manure made on their farms. When the early settlers first began to till the virgin soil, there was not any need for manuring, as the decomposed vegetation of the past centuries afforded an abundant source of plant food; but this supply has become exhausted or nearly so, and therefore it is necessary to make some return to the soil to replace that which has been removed in the form of crops. In this essay it will be endeavoured to outline a system of handling manure which can be practised by any pains-taking farmer.

Farmyard manure may be called a general fertilizer, and it is the great source from which the average farmer must build up and renew his soil. It is the natural and most economical method of adding to the fertility of the land. It contains all the elements required for plant growth, it has a beneficial action on the mechanical condition of the soil, and its effects are noticed over a much longer period than commercial fertilizers, as it forms into compounds which decompose slowly in the soil. Ordinary farm manure may vary much in composition, the composition will depend upon 1. the animals 2. the food consumed; 3. the kinds and amount of litter used 4. the preservation of the manure.

The manure made from horses and sheep undergoes fermentation very quickly and should be mixed with cow manure to retain its valuable mineral elements. The food consumed has considerable effect on the composition; the manure made from an animal fed on a rich diet will be of more value than that made from an animal fed upon a poor one. The litter must also be considered when estimating the value of manure.

To retain the most valuable constituents of manure, it should be kept under cover and in many cases it is practicable to construct a shed for this purpose. It should be convenient to the stable and built so as to prevent any liquid manure escaping. Sufficient litter should be used in the stable to absorb all the liquid excrement, and the best material for this purpose is peat or moss, but as it cannot be obtained by most farmers, cut straw will be found to serve the purpose admirably. The use of gypsum or land plaster is indispensable. It should be sprinkled on the stable floor behind the animals. It prevents the escape of ammonia from the freshly excreted urine which would otherwise pass off as a volatile gas; by its union with gypsum it forms a compound which is not vola-

tile, yet readily soluble. It also prevents any disagreeable odor arising.

When the solid and liquid manure is together removed from the stable to the manure shed, it should be spread evenly over the whole surface and packed down firmly. Manure rapidly undergoes fermentation; if placed in a heap the mass gets sensibly hot and a large quantity of carbonic acid gas is given off; fermentation is most active when the manure lies loosely, more air then coming in contact with it; it is least active when the manure heap is consolidated.

When fermentation occurs in consolidated, moist manure under a shed, a considerable portion of the carbonaceous matter is destroyed, but little loss of nitrogen takes place. If however the manure gets dry and mould appears, a serious loss of nitrogen has occurred. It is therefore good practice to either wet the manure heap once every three or four days or allow the cattle to trample it freely, this will pack the heap and check fermentation. To further prevent any escape of nitrogen, it is well to throw a layer of land plaster over the heap once a week. Manure cared for in this manner will come out of the shed in first class condition, and will be sufficiently decomposed to apply to the land at once, and will contain all the valuable mineral elements possible to incorporate in farmyard manure.

On farms where it is inconvenient to erect manure sheds, the manure may be kept in the open yard without any very serious loss, if properly handled, when the manure is removed from the stable it should be placed in a square or oblong pile in the middle of the yard which should be so constructed that it will drain to the centre. It is a common sight, on driving through the country in the spring, to see streams of dark colored liquid running along some farmer's barnyard. These streams contain the very essence of the manure, leaving the farmer a heap of leached digested fodder, little better than straw, and he applies this to his land and is surprised that he does not receive a larger return. The sides of the pile should be kept as nearly perpendicular as possible so as to have as little surface exposed as possible. Once a week during the winter, the sides and edges should be smoothed off and all loose and scattered manure thrown into the centre of the heap, any decomposed roots or spoiled ensilage should be carted out and dumped into the pile. If it is desired to make two heaps, when one is finished it should be covered over with earth or other material to prevent washing by rains.

It is not good practice to carry manure over from spring until fall, that which has been made in the winter should be applied to the land in the spring to obtain the best results.

Wood ashes made on the farm are certainly a farm manure, although they are considered as an artificial fertilizer. They are valuable for the potash they contain (1) and are an excellent manure for fruit trees, producing fruitfulness rather than the growth of wood. When applied to clover or potatoes they give good results and never under any circumstances should they be sold off the farm.

In conclusion a word may be said as regard composting. On most farms, there is generally enough refuse to afford material for a compost heap. All decomposed vegetables, the carcasses of animals which have died, bones and such material, should be placed in a heap together with enough earth to cover them, and turned once or twice during the summer. This will be found to be a first class fertilizer for garden stuff. It is about of the same value as farmyard manure, but will mix more readily with the soil.

ESSAY ON MAKING AND CARE OF FARM MANURE.

What it is—Food governs its quality—Manure-cellar.

By W. H. TRENHOLME,

Longue-Pointe.

The universal applicability and usefulness of manure made by domestic animals gives greater importance to the methods of its production, preservation and use than attaches to any other fertilizer that we use on our farms. It is a most direct source of valuable plant food and as it rots down, by reason of its fibrous texture it loosens heavy clay, binds together sandy soils, while its decomposition warms the soil and its power of absorbing moisture from the air keeps it moist.

Farm manure consist of the unassl-

(1) And for the phosphoric acid too. Ed.

milated parts of food which pass through the animals in the urine and dung, plus the litter which is variable in kinds and quality, and the value of the manure is always in a direct relation to the quality of the food. It is only by feeding our animals with food that is rich in the elements that constitute our plants that we shall get the best manure, for the manure of animals fed with straw is not nearly so valuable as the manure of those fed with hay, cotton meal, oil meal and other foods that are rich in plant food.

As regards the value of the excrements of different animals, it is an admitted fact, that the quality of the manure depends on the food.

If fed to a mature animal not increasing in any of its parts, it will return nearly the full equivalent in fertilizing constituents that the food contained, and in proportion as parts of its food are taken to form bones, flesh, milk etc., etc. the manure will be of proportionately less value. It is therefore only by feeding our animals good, rich, wholesome food that we shall succeed in producing the best farm manure. The care of farm manure is second only in importance to its production, and is apart of our farming that deserves far more attention than it usually received.

The best of all places to keep manure until required for use on the fields is in a stove cellar with a concrete floor directly under the animals, (1) so that all the urine will be saved, and if the manure of cattle and horses is put together in such a cellar, with a few hogs which will thoroughly mix and compost the whole, it will be found that manure so saved will be of the very best and will not have lost any of the ingredients that it first contained. When a cellar cannot be made, a shed made so tight as to exclude all rain, and a floor so made so that none of the drainage of the manure can flow away will be found a good substitute, but it would be necessary to use enough litter in the stable to absorb all liquid so that nothing would be lost.

The old system of putting the manure pile under the eaves of the barn has been and still is a source of great loss to our country, and if our government which is doing so much for the encouragement of agriculture, can induce our farmers to adopt better methods for the making and care of farm manure, they will have earned the gratitude of the people of our fair Dominion.

WASTE OF MANURE.—The English "Agricultural Gazette," in its answer to a correspondent, who asks if his practice of dunging young seeds is a correct practice, replies: "Perfectly correct; the only loss is water."

POTASH.—"Potash," says Prof. Wrightson, Principal of the Downton College, Wiltshire, Eng., "exists in sufficient abundance in most argillaceous (clay) soils. It is constantly restored in farmyard manure and in many other ordinary ways. Potash is as important and abundant, while phosphoric acid is important and scarce. If we take as a guide the general practice of good farmers, it appears that the need of potash has not made itself felt as has the need of phosphates and nitrates. There is no general demand for potassic manures, and the general use of farmyard dung has limited the demand, because a dressing of it contains a sufficient amount of potash."

(1) Not too wholesome, we fear! Ed.

MANURING GRASS, etc. At the last meeting of the New-York Farmers' Institute, Mr. Smith, speaking of the impossibility of growing clover on some old farms, said that it was owing to the absence of the "nodulogermis" in the land, and he did not know whether the application of potash would bring in these nodules or not. Some soils are known as "clover-sick," being devoid of these germs. On such soils a liberal application of a fertilizer containing nitrogen would, I think help it." Sir John Lawes' experiments, published in the Journal not very long ago, show distinctly that, where once land has been over-cloved, no amount of manure, however rich in phosphoric acid, potash, and nitrogen, will effect a cure. Nothing but a continued exemption for some years from being sown to clover, will restore the land to its original capacity of growing this valuable plant. At the same meeting, Mr. Rice did not at all approve of Mr. Smith's proposal to dress meadows with cotton-seed meal. He, Mr. Rice, would, and we think very wisely, give the cotton-seed to stock, care well for the manure made from it, and top-dress the meadows with it; thus getting a double return for the meal.

A farmer; name not mentioned; said that he "once used leached ashes to quite an extent on one of his fields, and can still see their effects on the crop, although it was several years ago, and the field has been regularly cropped since." Surely, in this case, it must be allowed that the action agent was phosphoric acid and not the trivial amount of potash left after leaching.

LOSSES IN MANURE.

Urine, &c., run into brooks Manure-cellars and sheds—Making middens—Rotting kills weed-seeds—Low prices.

The immense loss annually in manure alone in this Dominion of ours would very soon pay our national and provincial debts, if it could be prevented, and there is no doubt it could be greatly reduced if proper care and a little attention were given to the subject, without taking into account the great increase that could be made, without comparatively much outlay of money, each year.

In the following lines I will give a few rules which, if followed closely, will reduce the losses greatly. Perhaps, I might mention a few of the ways in which manure is wasted, first, before I give these rules.

The most common practice is to put the manure out by a side hole or window in the stable, there the manure is thrown, layers of straw, manure, and snow, time about, every thaw that comes the snow melts and runs from the roof, and all the rain that falls during the winter and spring. By the time all this water has leached through the manure pile, the greater part of the strength has run into the water hole and thence down the ditches into the creeks, and finally into the rivers and away to the great deep. Another very common way of losing the most valuable parts of the manure is to bore holes in the stable floors, and allow the liquid part to run away.

In the first place, there should be always on hand plenty of straw for bedding; if cut into 4-inch chaff, so much the better, to keep the cattle and horses clean. This will absorb the liquid parts. Dry muck is a good absorbent, wood ashes and even coal ashes will absorb some, and plaster is good; all

these if used will help to absorb the urine. There should, in order to save the manure properly, be a cellar with a roof over and a cement floor; this holds everything put into it, or even if the manure is put on level ground, if there is a cover over it, the losses are reduced very much.

Should it happen that you have not a manure cellar or an outbuilding to put the manure into, dig out a hollow where you intend to place your manure, say 12 to 15 inches deep, place in it some clay and take a wooden maul and tamp the clay down. If this is done properly, say 4 or 5 inches deep over the bottom, it will hold water. It is better to make your manure pile 4 square, by keeping your manure pile a little high in the centre, and after every snow storm shovel off the snow; in this way you will reduce the losses very considerably. In order to have good manure, the horse and cow manure should be mixed every day, if possible; the horse manure heats so quickly when by itself that it burns up the ammonia in it and soon becomes nearly useless, while if mixed with other manure it starts to heat and gets well rotted so that it may be used in the spring. Manure that has not been heated should not be used until it has passed through that process. This kills the seed of any weeds that may have been in the hay or other feed given to the animals to eat. When the manure is drawn to the field in winter time for use in the spring, make the pile as compact as possible, high in the middle with, say a little horse manure in the bottom to start the heating process. This pile should be placed on the highest spot in the field to prevent any danger from flooding, and should any of the best parts wash out, the lower portions would receive part of the waste, before it would get a chance to get to the ditches. Some may say all this may do very well in theory, but in practice it cannot be followed out. There is nothing in the foregoing but what any careful man can do, and should do, for farmers cannot get as good crops as formerly when the soil was rich and fertile. Prices are at rock bottom now, oats less than 20cts for 34 lbs., in fact, in some parts they are only paying 22 cts for 40 lbs., or very little more than ½ ct. per lb., barley 30 to 35 cts, buckwheat 30 cts, and other grains in proportion. The only way for farmers to do nowadays, is to reduce the cost of raising these grains to the lowest possible point, and this can only be done by saving the manure, and using it to make the farms fertile and grow large crops.

A few acres well tilled pay better than many acres poorly tilled: the latter may be done at a loss, while in the former case there may be a good profit—whatever is done now, must be done well.

Trusting that these few rules may be followed, and if followed carefully I have no doubt there will be less grumbling about hard times. Stop up the holes in the stable floors, provide litter or something else to absorb the liquids; keep the manure away from the drip of the eaves—under cover if possible—apply the manure properly, and you will soon see a great difference in your crops. In a word, study your profession, for it is a noble one, and you will be, in a sense, independent. (1)

Yours truly,

PETER MACFARLANE.
Chateaugay, 10th March 1897.

(1) Very good, indeed, Mr. Macfarlane. Ed.

The Apiary.

The following observations, on the Hive and the Honey-bee, have no pretence to originality; for, with the exception of a dozen old-fashioned straw-laves, in which the bees were slaughtered, when their honey was required, by the barbarous system in vogue fifty years ago, we have no experience in the management of an apiary; but, the marvellously well arranged publications on this subject that, nowadays, abound in the publishers shops, furnish such a fund of valuable and trustworthy information to those who, not absolutely unskilled in the manners and customs of the bee, have the patience to, by dint of study and investigation, suck out the deeper secrets of the manufacture of honey, and the very singular course of life pursued by the industrious creatures which inhabit the tiny houses built for their accommodation, that we are not absolutely hopeless of success in our endeavour to lay before our readers some facts and some lessons that shall, if they condescend to study them, avail to induce them to pursue, not without a growing pleasure in the pursuit, an occupation in the first starting of which but little capital outlay is needed, and which, sufficiently profitable on the whole, as regards payment for time and labour, is still more profitable as forming a means of delightful recreation to those who are too old or too feeble to occupy themselves in the sterner labours of the farm: we mean, of course, the occupation of bee-culture.

And, first, of the bee itself.

Honey-bees are insects belonging to the order, "Hymenoptera;" the former part of which word, "hymen," has nothing, in this connection, to do with the God of marriage, but simply means a membrane; the second part means a wing, and the whole is in allusion to the creature's four membranous, gauzy wings.

In a colony of bees, are found: (Plate 2.)

1. The Queen; a bee of peculiar shape. She may well be called the "Mother-bee," as she is the only perfect female in the whole, and all the eggs are laid by her.

2. A multitude of worker-bees, or incomplete females. Their duty is, while young, to take care of the brood, and do the inside work of the hive; and, when older, to roam abroad, gathering honey, pollen, water, and propolis or bee-gum, for the use of the colony, and, at certain seasons of the year.

3. Some hundreds or even thousands of "Drones," or male-bees, or males whose only duty is to fertilise the young queens, or virgin females. (After this duty has been performed, the unhappy creatures are expelled from the hive; the workers sting them, or gnaw off their wings, so that, after expulsion, they cannot return, and inevitably perish from starvation.

The skeleton, so to speak, of the bee is not internal, as is mammals, but mostly external. It is formed of a horny substance, called "chitin" from "chiton," perhaps, the Grecian soldiers' coat-armour, which also is again covered with hairs, each one of which, in form, structure, direction and position has a meaning.

The eyes of the bee are very marvels, and the more so, as each distinct kind is fitted with a an eye peculiar to itself.

Thus, the worker, who spends much of its time in the open air, needs very perfect vision, as a protection against possible dangers, etc., and, consequently, its compound eye possesses no fewer than 6,300 facets!

The queen-bee, on the other hand, rarely goes out in to the open air—only once after marriage i. e., with a swarm!—she has only 4,920 facets to each eye; but strangest of all, the drone, the greatest of stay-at-homes, has 13,000 facets in each eye! Can this be to enable him to distinguish more clearly his bride, the Queen-bee?

It can easily be proved that bees can hear, but to determine the location of the organ is difficult. Their "antennae" are doubtless furnished with the organs of hearing as well as of smelling.

THE QUEEN.

For many a century, all writers on the bee spoke of the ruler of the hive as the King. Butler, an Englishman, was the first to discover, in 1669, the real sex of mother of the hive; but this discovery seems to have lain unnoticed for more than a hundred years, till Swammerdam, ascertained the sex of bees by dissection.

The Queen is the only perfect female in the hive; her sole duty is to lay eggs, and she must be allowed to do that duty well and industriously, as a queen has been known to lay more than 3,500 eggs a day, for several weeks in succession.

A wonderful sight it is, to see the polite way in which the crowd of bees separate, and make way for her, at the approach of the good mother. If she is taken from them, the whole colony is crazy for the time; the bees run wildly over the combs, and even go outside the hive in search of her.

And how, is the Queen-bee reared? Thus: early in the season, if a hive becomes very populous, and if the bees are making preparations for swarming, a number of "royal cells" are begun. They are something the shape of a pea-nut, about one inch deep, and 1-3 of an inch in diameter. The walls are very thick, and are seldom seen after a queen is hatched, as the bees then cut them down into the shape of an acorn-cup. (v. fig. 2).

To these cells the bees pay every attention, and seem terribly anxious that there should be plenty of food in them. These cells open downwards, to save room; the others open sideways.

Any egg can produce a queen, if properly treated; it depends entirely on the food given whether a worker or a queen is the product. The peculiar way in which the royal larvae are fed has the following marvellous effect upon them:

1. A grub or worm intended for a queen becomes mature in nearly one-third of the time it would require had it been meant to be a worker;

2. Its organs of reproduction are completely developed, so that it can fulfil the office of a mother.

3. Its size, shape, and colour are greatly changed—v. fig. 1.

4. It will not attempt to sting, unless it meets with another queen, in the same hive, when it immediately sets to work to kill her.

5. It never leaves the hive, after impregnation, except to accompany a new swarm.

Should the regnant monarch meet with any accident and die, her place is soon supplied. If there are worker

eggs, or grubs not more than three days old, the bees make one large cell out of three, by nibbling away the partitions of two cells adjoining a third. Destroying the eggs or grubs in two of these, they give the occupant of the other the proper food for young queens, and the enlargement of the cell gives it plenty of space for development.

The first act of the amiable denizen of the enlarged cell, on emerging from her abode, is to hunt for a rival, hatched or unhatched.

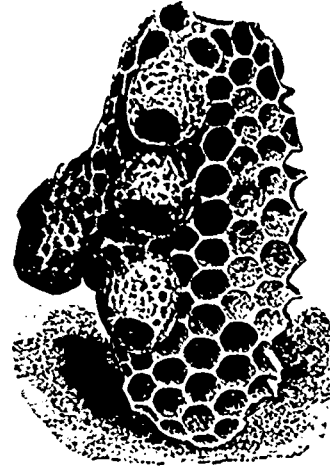
"Hardly had ten minutes elapsed after the young queen emerged from her cell, when she began to look for sealed queen-cells. She rushed furiously upon the first that she met, and, by dint of hard work, made a small opening in the end. We saw her drawing, with her mandibles, the silk of the cocoon, which covered the inside. But, probably, she did not succeed according to her wishes, for she left the lower end of the

throw out its occupant, whether worm, nymph, or queen. Therefore, as soon as the victorious queen had left this second cell, the workers enlarged the opening and drew out the nymph that it contained. The young queen rushed to a third cell; but she was unable to open it. She worked languidly and seemed tired of her first efforts."—(Huber.)

"Sometimes two queens hatch at the same time. We give below a translation of Huber's account in such event:

"On the 15th May, 1790, two queens emerged from their cells, at about the same time, in one of our observing hives. They rushed quickly upon one another's antennae, so that the head, corselet and abdomen of the one, were touching the head, corselet and abdomen of the other. Had they carved the posterior extremity of their bodies, they could have stung each other, and both would have perished. But it seems that Nature has

Although it is generally admitted that two queens cannot share the same hive, it sometimes happens that mother and daughter are found living peaceably together, and even laying eggs at the same time; but this only occurs when the bees having noticed



QUEEN-CELLS IN PROGRESS

that the elder queen has in part lost her natural fecundity are anxious to provide a successor.

(To be continued).

The editor can recommend a very respectable young man, as a "Landscape and Jobbing Gardener," in Montreal.

Household Matters,

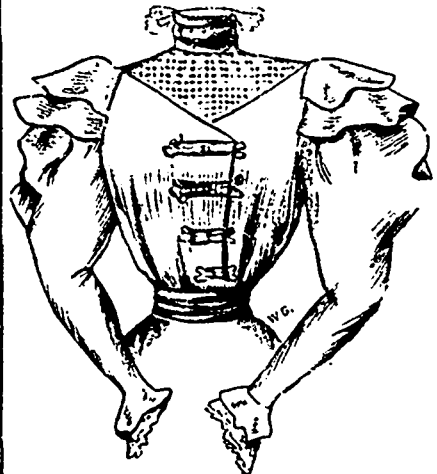
ILLUSTRATION.

This is an exceedingly pretty but very simple waist to make, being loose in the front it will be nice and cool.

The lappets on the shoulders help to make a trimming for the small sleeves now so fashionable. These might be edged with lace, which would make it still more stylish.

The collar and filling in round the neck are made of silk of some colour to tone in with the rest of the waist.

The waist lining is made to fit and



the rest fitted over this, back and front alike, with the exception of the braid on the front only, at the end of which the outer part must fasten either with hook and eye or with buttons.

A NEW FASHIONED IRON HOLDER.

People who do much ironing, know what trouble there is in keeping the holder from shifting, either causing burnt fingers, or, what is worse, constantly catching fire. I have found out a way to prevent this, and it answers the purpose well. Start by a bit of cloth

six inches long by five wide, and tack on layers till you get the desired thickness, good long stitches and plenty of them. By tacking on in layers, it is more easily done, as the stitches will not get burnt and will hold together much longer than by quilting through the whole at once. I found and made my first holder with some old "fibre chamois" I had, that had been used in a dress. It was soft, and being a non-conductor of heat was just the very thing for my purpose.

Two bits of anything strong, one for lining and the other for the cover, which must be larger than the holder by about one inch all round.

Leave the ends free, but turn the lining and tack on the outside, tack down outside over this. Take linen and cover at either side, turn in a bit, and run a gathering thread, both rather long stitches, draw the thread tight, and sew firmly, do this and you will have it shaped like a horse-shoe, thus forming a holder that won't slip and will last a long time.

Much talk about a small matter, but quite worth the labour.

ABOUT CLOTHES.

Pack your cloth dresses never so carefully when travelling, you are almost sure to get them wrinkled, usually right down the front. If the cloth has been sponged before making up and is of a good safe color, the trouble and delay of waiting for a hot iron may be avoided by dampening the hand in clear lukewarm water spitting the dress over the wrinkless. Then lay the spot over a smooth surface and gently smooth with the bare damp hand. Hang smoothly over a chair for a few moments to dry and the wrinkles will have disappeared. Remember, the goods must be dampened, not made wet. The same holds good with black silk.

Black lace which looks shabby can be revived by being washed in strong tea, which should be tepid. Squeeze the lace well in the tea, then rinse it in fresh tea, and let it remain for about an hour; then remove and carefully squeeze the lace, spread it evenly on a cloth, and beat it between the hands to abstract the moisture. Spread the lace out, right side downward, on a sheet of common foolscap paper, placed on the ironing sheet; carefully pull out the points of the lace with a pin then cover with more paper, and iron until perfectly smooth and dry. If it is necessary that the lace should be slightly stiffened, add a little gum arabic which has been previously dissolved in tea.

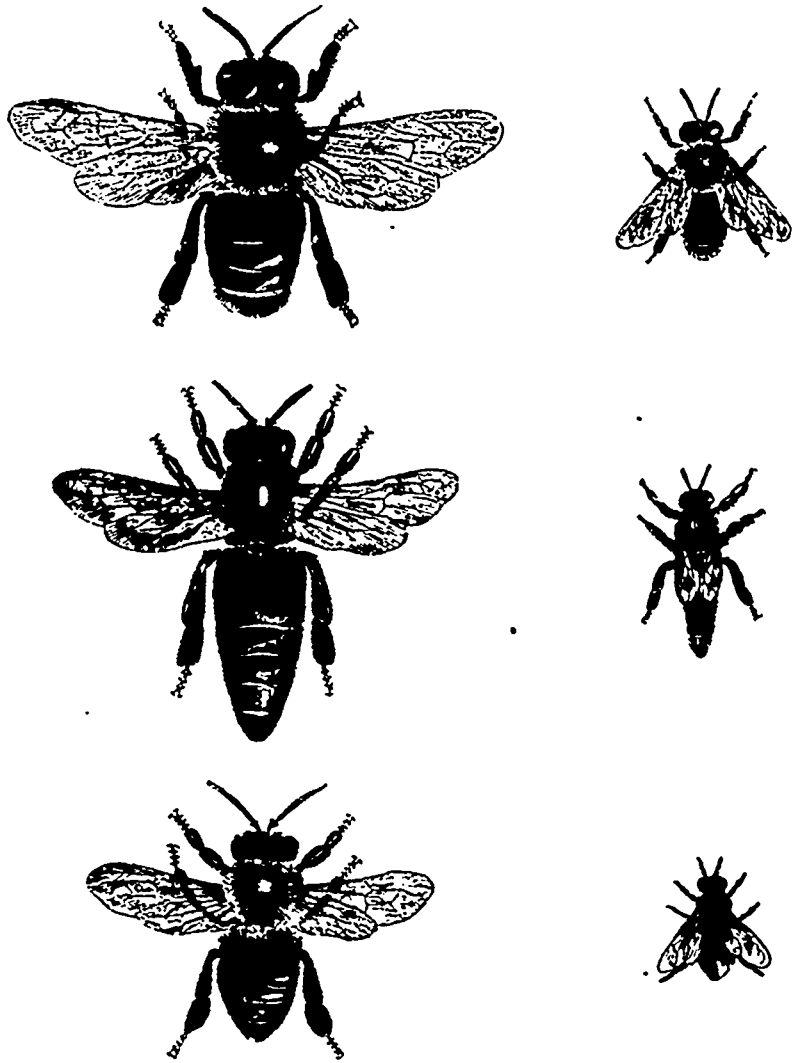
All traces of mud can be removed from black clothes by rubbing the spots with a raw potato cut in half.

Silk which has become badly wrinkled may be smoothed by sponging on the right side with weak gum arabic water, and ironing on the wrong side.

PLUCKING CHICKENS

FEATHERS AND MUSIC.

The sailor has his musical shanty to which he keeps time as he trots about the capstan until the anchor is hoisted to the peak, the farmer trills a lay to lighten his labors as he pitches hay into the wagon, and those songs are familiar to many, but whoever heard or saw a gang of Italian chicken pickers sing



QUEEN, DRONE, AND WORKER—Magnified and natural Size.

cell, and went to work on the upper end, where she finally made a wider opening. As soon as this was sufficiently large, she turned about, to push her abdomen into it. She made several motions, in different directions, till she succeeded in striking her rival with the deadly sting. Then she left the cell; and the bees, which had remained, so far, perfectly passive, began to enlarge the gap which she had made, and drew out the corpse of a queen just out of her nymphal shell. During this time, the victorious young queen rushed to another queen-cell, and again made a large opening, but she did not introduce her abdomen into it; this second cell containing only a royal-pupa not yet formed. There is some probability that, at this stage of development, the nymphs of queens inspire less anger in their rivals; but they do not escape their doom; for, whenever a queen-cell has been prematurely opened, the bees

not wished that their duels should result in the death of both combatants, and that it is prescribed to queens, while in this position, to flee instantly with the greatest haste. As soon as both rivals understood that they were in danger from one another, they disentangled themselves and fled apart. . . . A few minutes after, their fears ceased, and they attacked one another again, with the same result. The worker bees were much disturbed, all this time, and more so while the combatants were separated. Each time, the bees stopped the queens in their flight, keeping them prisoners for a minute." "At last, in a third attack, the stronger, or more savage, of the queens, ran to her unsuspecting rival, seized her across the wings, and, climbing upon her, pierced her with her sting. The vanquished queen, crawled languidly about, and soon after died."—"Nouvelles observations.")

and denude fowls to the time of the mangle? asks the San Francisco Call.

Such a scene can be witnessed any Friday evening at the Clay Street market, while the servants of the big poultry houses that have their places of business there are preparing for sale the chickens that the housewife buys for the Sunday dinner.

The men seat themselves in a half-circle and each takes a fowl. One stroke of a sharp knife across the throat puts the unfortunate squawking broiler out of his misery, and then the foreman of the gang starts his song. As they catch the air and the time, the others chime in, and in an instant the plucking begins. With rhythmic motion the nimble fingers grasp the feathers and pull them out during all the time of the song.

Feathers fly in all directions, but the song goes on until the last pin-feathers are removed and the carcasses are tossed into a pile, ready for the man who puts on the finishing touches and prepares them for the inspection of prospective purchasers.

The rapidity with which a chicken is stripped of its feathers is astonishing to the uninitiated who has tried it but a few times, and so adept have these men become that they finish their fowls simultaneously, and the process is repeated in unison. Three dozen birds are not considered a heavy night's work for one man, and when pressed for time, they manage to compass even more than that.

The song they sing is remarkably lively and sweet, and much resembles the song of the fishermen as they row their boats, though the time is much faster.

S. F. CALL.

The world is a looking-glass and gives back to every man the reflection of his own face. Frown at it and it will in turn look sourly upon you; laugh at it and with it and it is a jolly, kind companion.

Whether we really enjoy any lot in life depends upon the disposition we carry into it. The kind of eyes with which we see, the kind of temper with which we act will make much of little or little of much.

"Housekeeper."

DAMPNESS IN WALLS.

Both in the city and the country, a frequent source of worry is dampness in the walls of our houses.

The only resource in such a case is to try to make whatever materials are used to coat the walls impervious to moisture. For this purpose Messrs. Sanson and Corragre recommend—in the "Revue scientifique"—the following liquid:

Water at 100°, 10 litres (17.60 pint.)
Sulphate of soda, 3 kilos (6.612 lbs.)
Tartaric acid, 4,500 grammes (9 lbs.)
Sulphate of Zinc, 500 grammes (1 lb.)
Magnesium sulphate, 500 grammes (1 lb.)
Sugar candy, 1,500 grammes (3 lbs.)

The building materials—or the walls if already erected—are first treated with a solution of alkaline salts; they are then hardened by the wash which we have just given, applied by means of a brush; then give a coating of paraffine and linseed oil.

J. F. H.

The Orchard and Garden.

THE CARE OF THE FRUIT-GARDEN.

Now that the snow has all disappeared and the orchard and fruit garden are easy of access is a most suitable time for the fruit-grower to inspect his trees before the more laborious tasks of the farm claim his attention. The horticulturist ought not to forget that any extra care bestowed in ridding his stock of insect pests and injurious fungi will surely be followed by an increase in the quantity and quality of his fruit.

At this season the egg clusters of the tent-caterpillar are somewhat conspicuous objects and should be carefully crushed or better still burnt. From branches which are inaccessible to the hand they may be removed by mounting shears on a long handle. In this way less harm will result to the foliage of the trees than would occur if the worms were allowed to form their webs or "tents" and then burnt with a torch dipped in kerosene. The latter method always causes more or less injury. It resorted to after the leaves have appeared. The black knot is now easily discovered and should be removed and burnt so as to prevent its spread to other trees. Where it occurs on the trunk or large branches it may be cut out with a chisel, and the wound burnt with a red hot iron. The wild cherry, which commonly grows along fences, is frequently infested by the fungus and ought to be destroyed in order to prevent the contamination of the cultivated varieties of the cherry and the plum. In removing these excrescences, care should be taken to wound the cherry as little as possible so as to prevent the flow of gum which is liable to weaken the tree.

All trees should be freed as much as possible from the fungi and the adhering eggs of insects by scraping the bark.

This is also the proper time for the application of those fungicide and insecticide solutions which must be used only before the bursting of the buds; such, for example, as are used against the plum scale. In spring, the presence of this pest may be detected by the filthy black condition of the bark, produced by the fungi growing on the deposit of honey dew emitted by the scales in their young state. Should the scale prove a source of serious injury in this province, its attacks may most effectively be met by employing kerosene emulsion (standard formula diluted with four parts of water. This should be applied twice before the buds burst. If the remedy is to be used when the young scales are seen to be moving late in June, then it must be diluted with eight parts of water to prevent injury to the leaves. In like manner, the other winter washes against the woolly aphis, other scale insects and the leaf blister mites may be applied to advantage.

We are glad to note that the practice of spraying is now being recognized by our progressive fruit growers in this country as an essential part in their annual operations.

One orchard which came particularly under our notice last fall was badly affected by the fungous disease commonly known as the "scab," to such an extent, indeed, as greatly to de-

crease the marketable value of the apples. This state of things is disgraceful—the more so because it is preventable. The same condition of things no doubt obtains in other localities.

In this connection, a correspondent writes:—"We experimented on the Fameuse by leaving a row as a check among the sprayed trees, and there was from sixty to seventy per cent. difference when they were sprayed four times, the check row being badly spotted, and foliage showing a marked difference, being yellow and spotted. A check row in a different part of the orchard had been left unsprayed the previous year, and we noticed that the fruit last season was not so good as where trees had been sprayed." (Quoted in C. E. F. Report for 1895.)

Our fruit trees having last year produced such an abundance of fruit, we are likely to have a period of comparative rest for recuperation. Still, the horticulturist ought to avail himself during the coming season more than ever before of the method of spraying, if he wishes to improve the quality of his product. Even in these days of excessive production and keen competition there is always a good demand for sound fruit.

J. F. HAUSDEN.

THE PLANTING OF TREES

What trees to plant—Fruit garden—Orchard—Plums.

The following article has been sent us by M. A. Dupuis, nurseryman, Village des Athlates, county of Pilet, P. Q.

The spring time, with the days of glorious sunshine have come, and the snow is now visibly disappearing, yet a little while and we shall have green grass and the trees will be covered with leaves and flowers.

What a joyous season and how fraught with hopes for the horticulturists, especially those who endeavour to improve every year the condition of their orchards!

On the other hand, how the careless and remiss; who are always putting off. I am not now alluding only to the improvement between the necessary planting; are going once more to regret their neglect.

But even for these it is yet time to make good this omission. What's there to prevent them from setting to work this spring and ordering good fruit and ornamental trees?

But perhaps, they will be inclined to ask, as in the past. Why plant trees at all?

Our answer is that by so doing we increase to a considerable extent the value of any property, be it a large farm or even a simple village or town lot. The reason of this increase in value is that trees beautify a piece of property and give it that appearance of comfort which is peculiar to home.

Your trouble and your sacrifices will in this case be well spent in increasing the happiness of your family, and you will be amply recompensed for the trouble you have taken in seeing your efforts crowned with success. It is so easy and involves so little expense to plant trees in our country that it is really astonishing that this practice

is not more generally followed.

Trees form such excellent screens to protect us against the cold in winter, and afford us in summer such a delightfully cool retreat against the rays of an almost tropical sun, that after having once enjoyed their benefits it is hard to see how we can well do without them.

But, where are trees to be planted?

It seems only natural that trees destined to ornament our streets should be planted in the road itself; but we know nevertheless, that such is not generally the case. It is usually the custom, in villages and even in towns of some importance, to plant a row of trees along the front of the lots, at the distance of a foot or two from the line of the street. This is precisely what I have done myself, but if I had known as much as I know now, I should have planted them in the street, one foot or two feet outside the sidewalk, for that is the proper place for them. It may be said, perhaps, that it is easier to protect them, when they are inside the fences, from the mutilations of the thoughtless, both old and young, and against the injury which may be done them by horses and cattle; but you protect them sufficiently against both these sources of injury by boxing them in a suitable manner, unless the circumstances are exceptional.

It may now be asked, what trees we ought to plant.

One of the finest trees to plant along the road-side is the sugar-maple. Great care must be exercised in digging it up as well as in transplanting, otherwise it is not likely to take root again.

The soft maple, especially the variety with silvery leaves, is a fine tree which readily takes root.

The Norway maple roots well, it is a very fine species and grows vigorously.

The American elm is the shade tree par excellence for our streets and avenues, provided the soil be not too light or too dry.

The European birch, with cut or denticulated leaves, is one of the finest ornamental trees. Sandy soils are well suited to it.

The oak, the black walnut, and the butternut are fine shade-trees, if they are planted in good soil. Try to procure fine trees from the bush, or buy trees grown in the nursery.

For the church-yard lot, the trees and shrubs the most prized are the European weeping birch, the weeping willows Kilmarnock, new American and Rosemary, the Snowball and the White rose bushes "Merveille de Lyon", "Madame Bruant" and the "Belle of Baltimore." For the garden, the bushes which are the hardiest and have the best appearance are, the Snowball, the Climbing honey-suckles, the Tartarean honey-suckles, the D. u. z. a., the Spiraea, the seringas and the Barberry-bushes. To all who wish for choice roses, I can recommend the following varieties:

"Général Jacqueminot" bears large, crimson, scented roses.

"Madame Joly", of the form and sweet scented.

"Merveille de Lyon", a double and very large white rose.

"Paul Neyron," the largest and of a deep rose colour.

"Princesse Camille," a very fine rose, with dark red velvety flowers.

"Crested Moss," very fine and sweet scented.

"Belle of Baltimore", the roses are nearly white and grow in clusters. The effect is superb. This rosebush is very popular; it blooms at the end of summer and is very hardy.

"Yellow Harrison," a double rose of a bright yellow.

FRUIT GARDEN.

Plant apple trees that are hardy and which bear fruit early, as life is too short to plant trees which do not bear before 12 or 18 years; plant such early varieties as:

"Russian Transparent" producing at 2 years apples excellent for the table or for cooking. Ripens from the 1st to the 16th of August.

"Duchess of Oldenburg", a fine autumn apple. This tree bears early and is prolific.

"Wealthy," or Fameuse of the North-West, very early and a prolific bearer, producing fine, large, red winter apples.

PLUM TREES.

The "Damson," "Bradshaw," "Lombard," "Imperial," "Golden Drop", deserve the place of honour in the fruit garden; do not neglect the strawberries, raspberries, gooseberries and the currant bushes. If they are planted early they may yield some fruit even this season. Let those who derive pleasure from their orchards and wish to have fine trees make haste to place their orders with experienced nurserymen. Herein lies the secret of success.

A. DUPUIS.

Villages des Aulnaies, Co. de l'Islet.

LET US PLANT FRUIT TREES

Grafting and budding of the plum-tree and the cherry-tree—The best varieties of apples for the English market—Varieties for the East and South-West of the province.

G. A. Gignault, Esq.,

Assistant-Commissioner of Agriculture, Quebec.

DEAR SIR,

If the Honorable M. Beaubien carries out his intentions, it will be possible to send grafts by post at the rate of two cents for every package of twenty grafts.

I have given up grafting the plum and the cherry because I have received so many complaints from people to whom I had sold them. Budding in summer is preferable for the cherry-tree and the plum-tree. No apprehension need be felt in delivering in the district of Quebec the grafts of any of the following kinds of apple-trees: "Russian Transparent," "Duchess," "Wealthy," "Russet," and "Ben Davis," "The last two varieties, which you recommend for England, thrive perfectly as far as Rimonski, and the first three as far as Chicoutimi and the Magdalen Islands.

The "Spies" and "Kings," which are so popular in England, according to your report, corroborated by the trade bulletins this fall, have yielded magnificent fruit here this year. They deserve to be tried in the counties of the south-west of the province. I have sufficient material to graft about 1000 of each kind. You have taken so much trouble to find out what varieties sell

for the highest prices in England, that every effort ought to be made to spread and disseminate them.

I have the honour to be, Your obedient servant,

AUGUSTE DUPUIS.

Village des Aulnaies, February 18th, 1897. (Translated from the French by J. F. HAUSEN.)

CIDER AND VINEGAR

The manufacture of cider and vinegar is a large and growing industry in this State.

The operations are usually conducted on a large scale, and machinery takes the place of manual labor, wherever possible. Probably, the largest establishment of this kind in the State, or in the world, is that of the Genesee Fruit Co. at Holley, N. Y., which has a capacity of 10,000 bushels of apples per day and an annual product of more than 1,000,000 gallons.

In the yard, outside the cider mill, apples can be dumped from the farmers' waggons into a hopper, sunk in the ground, from which an elevator takes them to the top of the building and to the machine, which grinds them into pomace. The pomace passes into large vats on the floor below from which it is drawn as the presses, still another floor below, require it.

The extracted juice is carried by steam pipes to any portion of the various buildings where needed for the vinegar generators, storage or shipping. The juice and vinegar is stored in large wooden tanks ranging in capacity from 2,500 to 80,000 gallons. The pressed pomace, the removal of which used to be a source of expense, is now burned in the boiler furnaces.

The varieties of apples are seldom separated for cider making, with the exception of the Golden Russet, from which is made the popular Russet Cider. The greater quantity of the cider produced is used in the United States, only a limited quantity being exported to Great Britain. Most of the cider produced is used in its natural sweet state. By exercising great care in the manufacture, fermentation may be delayed or prevented to a certain extent. The racks and cloths should be regularly steamed and sterilized, so as to remove all particles of fruit as well as germs which cause fermentation, and the juice, as soon as it leaves the press, removed from contact with the atmosphere and kept at a low temperature.

In the making of refined ciders, various processes are employed, which are considered by the manufacturers as trade secrets and not divulged.

A sand lacking in iron, and obtained from Shorburne, Massachusetts, has been largely employed in refining cider. The juice was filtered through the sand but this has now been superseded by wood pulp.

It is generally conceded, however, that to keep cider sweet for any length of time, salicylic or other acids must be employed.

For economy in packages and freight, cider is sometimes condensed into one fifth of its original volume, this is done by evaporation in machines constructed for the purpose. The cider is restored to its normal condition by the addition of an amount of water equal to that evaporated.

The apple juice is converted into vinegar by means of generators or converters. These are large upright wooden tanks of varying capacity. As in

the case of the operations in connection with the refining and keeping of cider the manufacturers do not care to give details of the process, which, as far as I can learn from outside sources, is somewhat as follows.

The generators are filled with beech-wood shavings, corn cobs, or other material which will not affect the flavor of the juice. This material is then saturated with vinegar, when the generator is ready for operation.

The fresh juice is admitted at the top by means of an automatic arrangement which, when full, reserves and distributes the juice evenly over the whole surface of the tank, this is repeated as the machine again fills, the liquid constantly descending through the saturated mass until it reaches the bottom, by which time it is converted into vinegar.

The principle which secures this rapid fermentation appears to be the free contact with the air obtained by the fermentation.

The vinegar thus obtained is used almost entirely in the home markets where it finds a ready sale. State laws are enacted providing for the proper labeling and sale of vinegars, thus providing against competition from the cheaper or acid-made stock.

GENERAL REMARKS.

Notwithstanding the number of evaporators, cider and vinegar mills and canning establishments, the products of the orchards of Western New-York this year was too great to be used. Large quantities of apples were allowed to remain in the orchards after having been gathered and the first quality sorted out and barrelled. This was most noticeable in Niagara County, almost every orchard containing large piles of red, green and golden fruit, Baldwins, Greenings and Russets, spoiled by the frost.

Good apples for canning or evaporating are supplied at ten to sixteen cents per 100 lbs. and for cider and vinegar as low as 5 cents per 100 lbs.

Evaporated products are quoted at:

- Apples, prime... 3 cents per lb.
" Chops... 1 to 1 1/4 "
" Waste... 3/4 to 1 "
Juice or sweet cider... 3 cents per gal.
Prepared Sweet Cider 4 cts per gallon.
(Guaranteed to keep 30 days) (1)
Vinegar... 4 cts per lb.

These prices are exceptional, owing to the unprecedented crop, and both growers and manufacturers unite in the opinion that there is no money for them in the business, this year.

The average prices obtained during the past few years have been nearly double those quoted for the above products, enabling the evaporator to pay from 15 to 20 cents a bushel for the fruit.

The earlier or summer varieties of apples are not evaporated to any extent, being softer and fresh they do not give such a large product as the hard fleshed varieties, and being deficient in sugar, the product is not of much value for the making of cider or vinegar, for which purpose, much of the waste and chops of the harder varieties is employed.

The evaporated products from a bushel of soft or summer apples range from 4 to 5 1/2 lbs, and of winter apples 6 to 7 1/2 lbs, the cost of manufacture being the same: 10 to 12 cents per bushel. The size of the apples add to or lessen the product, there being less waste in those of large size.

(1) Our Gloucestershire cider we have often drink 5 years old: as sound and "dry" as good sherry. Ed.

CONCLUSIONS.

The chief object in evaporating fruit is, that in this form it is more easily kept and more cheaply transported to distant markets, the fruit is not materially changed or the purposes for which it may be employed, thus, immature or poor fruit will ensure a product no more fit for use than in its natural state. The success or magnitude of the fruit evaporating industry would therefore appear to depend upon the quality of the fruit, an abundant supply, and the price at which it could be obtained.

The foreign markets are at present chiefly supplied from the United States; and it is claimed by the Fruit Growers of Western New-York that they can grow apples at a profit, and supply the evaporated product at five cents per pound. If we are to prosecute this industry on a large scale in the Province of Quebec, our farmers must grow more winter apples, as the summer varieties are not profitable for evaporation.

I have the honor to be, Sir, Your obedient servant, W. W. DUNLOP. Secretary Pomological and Fruit-Growing Society of the Province of Quebec.

CANADIAN PRODUCTIONS IN DEMAND IN ENGLAND

It appears, from information we have received from Quebec, that Mr. Harrison Watson, the Manager of the Imperial Institute in London, is desirous of knowing all about the various productions of this country, since several of the chief importers in England of foreign goods have asked him for information concerning our honey, maple-sugar, and flax.

Now, as regards maple-sugar, for instance, we have just received a bulletin from Prof. Macfarlane, the chief analyst at Ottawa, in which it is clearly demonstrated, from the results of 104 analysis of that comestible, that hardly such a thing as the most trifling adulteration of it is practised in this country, and in the excessively rare cases in which some meddling with it had occurred, the analyst could only detect a slight addition of glucose-syrup, which is as harmless and wholesome as any saccharine matter can be; though, of course, the consumer has every right to be protected against being served with an article other than that which he asks for and pays for.

Our honey is as good and pure as any that we have ever tasted, and we hope that when a trade in this article is established with England, the producers of that article will see to it that no temptation induces them to contaminate it with any by-product of any kind.

Our flax is, we fancy, grown more with a view to the production of seed than for fibre; but, as many thousand acres all over the country are perfectly adapted to the growth of this plant, and as there are plenty of streams and brooks well suited to the retting of the stems, there is no reason why Canadian flax should not become a favourite article on the English market.

We strongly advise Canadian exporters to put themselves into communication with Mr. Watson, who will, doubtless, give them all the information on this most interesting matter that they can desire. We are convinced that a great and increasing trade, in the three articles mentioned above, can be estab-

blished with Britain, and we trust that our merchants will see the advisability of taking early and strenuous steps to promote it. The Department of Agriculture is collecting samples of these goods, and will shortly forward them to England.

Swine.

A FEEDING FLOOR FOR SWINE.

CORNSTALKS AND STRAW.

"Eds. Country Gentleman."—Any one familiar with swine-feeding in the central and western States, knows that feeding floors are an exception rather than the rule, and that nearly all the corn is fed on the ground—the best of all floors when the ground is in proper condition, and as poor as can be when very muddy. As floors are not used much, feeding is often done in the mud. While we have no plank floors, we manage so that little feeding is done on muddy ground.

The spring pigs we aim to have on the market before the very soft weather of the fall comes on. One fall we failed to do this, and to get the hogs that would weigh over 200 pounds each off the pasture where we had been feeding them, we turned them into a lot surrounding the straw stack, and to prevent this lot from becoming an unfathomable mud-hole, we pulled straw from the stack and scattered it over the place where we wished to feed the ear corn. We did it, not because we thought the straw at all desirable for the purpose, but with the hope that it would prove better than the mud.

We were agreeably surprised at the results. By pulling out of the side of the rick every day or two and scattering the fresh straw over the feeding ground, we had a clean place to scatter the corn, and also made holes for comfortable beds for the hogs in the side of the rick. The hogs seemed to enjoy eating the corn on the clean straw floor, and as they have no rings in their noses, and never have had any, they took great pleasure in turning up the straw for the shelled corn that worked into it while they were eating from the cob. The hogs' faces always looked neat and clean; they had no mud on their feet and legs, and from all appearances, they made an excellent gain while fed in this way. The pointer we got then we have put into practice, more or less, ever since.

As we rotate our crops and our hog feeding as well, permanent feeding floors and houses are not desirable. And if we can get clean feeding floors without using plank, we save considerable expense which helps us to make the cheap pork that we must sell cheap.

As is the practice in this part of Ohio, we feed most of our corn fodder out of doors in boxes, in lots adjoining the barns and sheds. Our brood sows are kept in one of the barn lots where the horses and some of the cattle are fed fodder during the day. The sows are fed their corn scattered over cornstalks. Sometimes we shell the corn before scattering it out to them. This is desirable because it compels them to take exercise to find it. And more, when they get each grain by rooting the stalks about for it, they chew it thoroughly and consequently digest it better. While they are hunting for the corn, they are doing an other job for us that we are glad to have them do—that of forcing up the cornstalks and mixing the droppings with them.

In another lot we are feeding fodder to young cattle. Adjoining this we have a lot where in good weather we have been feeding our fall pigs. For a while this has been too muddy for ground feeding, and as the pigs have the run of the cattle lot, we concluded to feed them on the cornstalk pile, but to do this it was necessary to shell the corn.

This we scatter over the stalks, and let them root for it. We find them good faithful workers, and that their appetites are improved by it. We much prefer to have them work two hours here to get all their feed, than to have them get in it half the time and lie in the shed the other half. Their working over the stalks hastens decomposition, and fines them so they can be hauled to the fields and scattered as manure any time we wish. Without the work of the pigs the stalks would have to be worked over with a fork by hand—or allowed to lie till fall to decompose. The way we work it, the cornstalk manure can all be moved to the fields during the spring and summer, whenever we have leisure, with the teams.

When we have straw, we use it under the troughs where we feed middlings and bran, and the slop that accumulates about the kitchen. We find it answers an excellent purpose. If a little straw gets into the troughs it is not as bad as mud.

Farmers that have floors to feed on know that the hogs tramp or carry mud onto the floors. This can in a great measure be prevented by scattering straw around the floors so that the hogs will have to pass over it before going onto the floor. By doing this they leave most of the mud on the straw.

I want it understood that I would not undertake to feed pigs or small shotes on a straw floor, about a straw stack, and allow them to make their nests in the straw. They would soon overheat themselves by lying in wet nests, and be attacked by the diseases incident to the exposure of their steaming bodies in inclement weather. The larger hogs nest themselves to better advantage, and do not bury themselves in the straw as the pigs and shotes will.

JOHN M. JAMISON.

"Ross County, O."

THE BROOD SOW.

"Ed. Hoard's Dairyman."—When I visit the stock yards and see the number of brood sows that are fattened and sold this season, I ask myself the question: Does the farmer turn these valuable sows off, out of sheer habit and custom, for their greater weight, or has he never given it any thought and considered their value as breeders, mothers, and milkers? When we put a young, untrained sow in her place, we have first an uncertainty as to the above mentioned essential qualities; next the cost of keep, if we wish to develop her—give her an unstimulated growth, as we should—would differ but very little. In the two-year-old sow we have an animal, if well cared for, that is perfected in all respects as to growth and maturity; and it is no new theory that parent stock should be fully developed, and that their offspring will be more perfect in size, vigor and constitution.

The much complained of want of bone, size and vigor may find its rea-

son in the much abused practice of immature breeding; and probably with no other domesticated animal is the abuse of the natural law as great as that in swine breeding. Breeders of pure bred swine, that are masters in their occupation, know only too well the value of aged sires and dams to perfect their breeding stock, and are not infrequently led to part with them, so as to supply their customers with a new strain of blood.

It might not be in the interest of the breeders' fraternity if boars and sows were kept to a greater age on the farms generally, but it would greatly improve many desired qualities in the farmers' hogs. There are always a sufficient number of old sows that must and ought to be discarded as breeders, because of unsatisfactory results, showing therefore, that with each new selected lot of young, unfired sows, we are departing each year farther from the law of selection of the best, so essential for the improvement of stock. And where there is a number of old sows retained, it avoids the necessity of breeding the new in-coming sows at too early an age. A young sow has a better chance to develop her maternal functions when warm weather and nutritious grasses assist her.

If other rules as to cure and feed are complied with there would be less complaint of ailments that are too often caused by immature breeding.

The common phrase, so generally used in swine husbandry, "bad luck," is generally due to lack of intelligent management.

THEO. LOUIS.

OVER-FEEDING BROOD SOWS.

Many a fine litter of pigs is lost and especially in times when farmers want to be particularly good to their brood sows by giving them too much feed the first three days after farrowing. We have often noticed that the experienced brood sow should she be allowed to have her own way at that period and has the range of the farm will prepare her nest carefully on the south side of the hill, if possible, or with some other protection from the north-west winds. She will, if possible, make her nest near a spring or slough. If her habits are closely watched, it will be noticed that she will eat nothing the first day. The second day she will probably go to the spring and take a drink and may be nibble green grass if there is any convenient. The third day she may be looked for to come home bringing her pigs with her with pardonable pride, and will usually bring a full litter of healthy squealers.

We do not recommend giving sows this liberty, but it would be better for some farmers if they did. By studying nature we can provide better quarters than nature furnishes, can take advantage of the instinctive wisdom of the brood sow and also of the wisdom of man, but upon one point, however, nature is inexorable; the brood sow must not be fed heating food the first three days. To do so is to invite caked udder or what is known as milk fever, and destroy a litter of pigs. The first day give nothing but water—dish water is as good a thing as can be given. The next day stir a little bran in it; the third day add a little bran and oats, the fourth day a little corn might be added, but the sow should not have a full feed of corn for a week or two.

There is no trouble in giving bran or shorts, or ground rye or barley, in the form of slop in other words, the brood sow with a young litter of pigs should be given a dairy cow's ration. She should be fed for milk and not for meat. It should be remembered that for the first three days the system is feverish and that in no fever is there any appetite, and therefore to encourage a sow to eat food such as corn is simply inviting disaster.

Never give sour milk to the brood sow with a young litter of pigs. To do so is to invite scouring and ruin the prospects of the litter. When pigs are two or three weeks old there is not much trouble in developing them right along provided there is no disease to interfere with feeding operations. The difficult thing is to feed properly during pregnancy and the first two weeks after the litter comes into the world. There has been no time in the state when it was so important to look after these matters.—"Exchange."

ARTICHOKES FOR HOGS.

The hogs ate the tops greedily. When I would go back to the patch the next day, not only the artichokes and tops, but also the roots would be eaten up clean. I told my man to pull up and throw over to the hogs a mess every day. When I went in the evening to feed them more artichokes, they had cleaned everything up so clean, roots and all, that I upbraided him for failing to feed them some of the artichokes in the morning. He told me that he had given them more in the morning than I had just thrown over for their evening meal, and said, "You take the pole and go fishing along the creek and you will find that the hogs have eaten up the artichokes, the tops and the roots, clean." I did as he suggested and found it was true. The stalks are very brittle and tender and if cut before Septer 1st would yield twenty tons or over per acre on rich soil. I found them sweet and palatable to the taste and free from fibrous covering such as hemp has. They shade the ground so as to minimize the effect of drought. Once planted, if not rooted too late in the spring, the tubers on the root joints produce a new crop. The way to kill them is to plow and harrow shortly after the shoots have come up. This was my first year, but it has satisfied me that the white French artichoke is of great value. I shall save seed in March, before turning the hogs in.

JOHN H. ROE.

Chana, Ill.

"Hoard."

SWINE BREEDERS IN COUNCIL.

At the annual meeting of the Cheshire Association at Ithaca, N. Y., (briefly noted on page 51), Prof. Roberts said:

"The original type of hog in England, the wild boar, and the type found in India, which may have a pedigree 1000 years old, when united made a combination which was hard to improve, and whose influence is still occasionally seen. If you think it easy to improve on the original types, try the bison. Life is too short and the young breeder had better buy of some breeder and begin where the seller left off. Hogs were too long in the ear, nose and leg

Better food was given, and improvement, which is another name for fat, began. The Sussex came in as a protest against waste and cheap portions. This protest was carried too far, and they, with the other breeds, became too small. The red hogs found a place in public estimation when the rebound came. At present all breeds are, with slight peculiarities, practically identical in shape.

Our aim should be growth—any breed will fatten. We should steer clear of the errors of the past and recognize the fact that it is more difficult to feed than to breed.

"Question."—Shall we fatten for showing at the fair?"

"Answer."—The average man wants to see what the possibilities are, and the opinion of the judges compels an exhibitor at present to show fat animals if he receives any premium. Such animals are generally ruined as breeders, and a breeder should have two sets of animals, one for show and one for breeding. The breeder should strive to educate all, and should not sell show animals for breeding purposes.

W. B. Mandoville spoke on Feeding and Fattening Swine in substance as below:

Commence feeding for large, strong pigs before they are born, as many generations back as possible. Pigs from ancestors that have been kept under proper sanitary conditions, and have healthy digestive organs, can take disease germs into their system with impunity, because the germs find no weak or diseased place to attack, and are harmless. Will the hog kept in a filthy 7-by-9 pen, with slanting floor on which it slips and slides as it moves for corn among the manure, produce as good pigs as the one which has a clean, dry pen, a chance to exercise in the sunshine, and feeds on clover bran or middlings in summer, and in winter such succulent food as turnips and beets? Said an exhibitor to me at this fall's fair: "If your hogs were as fat as mine, they would be over on their hocks and turn up their toes as bad as mine." "No," said I. "They have out-door or shed exercise every day in the year and never break down." The sire may be half the herd, but I would have healthy, vigorous mothers first, and as good a sire as I could. Too many feed with the single object of producing flesh alone. I would rather have a profit on a 200-pound pig at six months than to make the same pig weigh 400 pounds at the same age at a loss. The ability to brag of the biggest hog does not pay debts. At two weeks of age, I would feed the litter a little thin slop made of five parts wheat middlings to one part oil meal; unless milk can be had, mix with water. Feed away from dam. Do "not overfeed." In winter, at six weeks, add sliced beets; in summer, young beets; add to the variety of food as they get older. In clover pasture, sow oats, wheat, barley and rye in equal proportions, three bushels per acre. Feed peas, vines and all, when large enough for table use. Have sweet corn come in when peas fall. They will eat stalks and all. Would feed slop and fodder once per day. Would not feed all they will eat, but all they will digest, and there is a wide margin between the two. There is peculiar smell, about the droppings of any animal that has been overfed. It comes from fermentation of food instead of digestion. At three months make the slop of 400 lb. wheat bran, 400 lb. wheat middlings, 200 lb. corn meal and 100 lb. oil meal. We want healthy, lean meat and fat with some

fiber in it rather than a lardy carcass. Take a pig of 200 lb. weight that has been fed as I have indicated, sugar cure the hams, shoulders and bacon, smoke them thoroughly with green hickory wood and you will agree with the Jew who said, "Ah, mine friend, Moses did not understand the seductive qualities of a sugar-cured ham when he spoke."

Any man can put a given quantity of food into the trough for a given number of pigs, but a few minutes spent in watching them eat is not wasted time. A slight falling off of appetite or lack of vigor will be noticed and remedies applied in time.

The man who fails to keep the pen clean and does not use disinfectants is making a mistake a balanced ration will not rectify. Earth is good. Oxide carbolic acid diluted 100 times or lard plaster, should be used to purify the pens after every cleaning.

"Question."—What makes pigs potbellied?

"Answer."—Feeding a ration too bulky and poor in quality, compelling the pig to distend the stomach to obtain enough nourishment to live, or else a concentrated rich ration which produces fermentation and gas.

"Question."—How much feed is required for a pound of pork?

"Answer."—From 273 to 561 lb. for a gain of 100 lb. of meat on pigs weighing 50 to 300 lb. The first may cost 2½ c. and the last 5½ c.

"Dr. Smead."—Oat hulls cause indigestion, also too rapid feeding. The hog in its native home eats at time. Scatter grain in straw and compel exercise. (This advice has often been given for poultry, but is new for swine.) The larger the run and the more young pigs root and race, the better and straighter will be their legs. C. E. O.

Farmers' Clubs.

REPORT OF A SHORT TOUR IN HUNTINGDON COUNTY

Agriculture is progressing—A model of a Barn Shipment of milk to Montreal—Orchards spraying, pruning—An active Farmers' Club—Winter butter-making—Draining a swamp.

Montreal, April 2nd 1897.

G. A. Gignault, Esq.,

Assistant-Commissioner
of Agriculture,

Province of Quebec.

Sir:

Agreeably to your instructions, I have the honor to report that I have visited, and delivered seven Lectures on Improved methods of Agriculture in the County of Huntingdon. It is gratifying, in the first place, to note that since my former visit in 1894, there is a decidedly greater interest manifested by farmers in the cultivation of their land, and in the breeding and management of their stock, and I have no doubt this is attributable to the efforts of the Government in the establishment of Farmers' Clubs, publication of literature bearing on the subject, especially the "Journal of Agriculture," which is greatly appreciated, and by Lectures.

At Hemmingford I found an audience who greeted me very kindly, and showed by the numerous questions they propounded that they were thoroughly in earnest.

On my way to Vickers, I inspected a herd of milking cows belonging to Mr. James Burke. I found them in admirable condition, and the building they occupied was a model, in many respects. It was perfectly well lighted (a matter too frequently neglected), the ventilation was complete, and the animals quite clean. Mr. Burke sends his milk by railway to Montreal, and by this means he realizes a better price than otherwise, and, though he buys largely of feeds, he states that he makes his business pay. He demonstrates the fact that cows will yield an abundance of milk throughout the year by proper treatment.

At Vickers, I had a very intelligent and appreciative audience, in which were many ladies, who took a good deal of interest in the proceeding. I was in the vicinity of Covey Hill where are the extensive orchards of Mr. Edwards, a frequent prize-winner at the Exhibitions, and, at the request of that gentleman, I had the pleasure of explaining the process, and impressing the necessity of spraying, of and, paying close attention to all the details of culture necessary to make an orchard successful.

I also had an interesting talk with Mr. Edwards, and he was quite of the opinion that some more must be made as to the more careful packing, inspection, and placing our fruit in good condition on the markets of the Old World, if we are to insure fair prices and secure the confidence of buyers. I passed by the large orchards of the late Canon Ful'ou. I was surprised at their extent and the size of the trees, which looked in a healthy condition, and, I am informed, are to have, this season, the pruning they require. One of the greatest mistakes I noticed in all the orchards is, that the trees were originally planted too close to each other, and no effort is made to thin out the branches by proper pruning. At Franklin Centre, I found a good deal of interest in dairy farming, and had to answer a number of questions. The Farmer's clubs here have been very active, and a spirit of enquiry and progress is the result.

Cazaville, a large and representative meeting of farmers, presided over by J. O. Stewart M. D., an extensive and enthusiastic farmer in addition to his profession. I found here that great progress had been made since my last visit: many silos have been built, and the creamery has been running successfully all the winter. A Hop Garden here, 100 acres in extent, gives employment to a good many persons, during the picking season, as many as 800.

Dundee, has good land for fruit and pasturage, and the farmers, as a rule, are progressive and prosperous.

In a conversation I had with Captain Smallman, he told me of a writer in the "Rural New-Yorker" who asserts that he has cut 5½ tons of cured hay per acre off 5 acres and 6 tons off one acre, by a peculiar method of preparing the land and seeding. He states that his plan is to sow no cereal crop but to get the land into a highly fertile state, by rolling and harrowing it a number of times until it is perfectly smooth, it is in such a state that every seed will grow. Then he sows 32 quarts of mixed grasses to the acre. Captain Smallman, who is a good farmer said that he could not believe the statement until he knew, and studied the "modus operandi," and then he began to think it reasonable and is now experimenting on a piece of land to test the result by sowing 24 quarts to the acre. The writer of the article alluded to, is of the

opinion that it is a loss to sow oats or barley the same season as clover or mixed grasses on the same land, because the small seeds are overshadowed by the grain, and perish before they are well rooted in the soil.

At St. Agnes, I had the pleasure of meeting a gentleman, Mr. Emloft, who purchased a 150 acre farm here, 5 years since, which was a swamp and considered almost valueless. He went to work and drained it, by means of open ditches; ploughed it carefully etc., and last year harvested 15,000 bushels of oats, had more hay than he required for 36 cows an average of 6 horses and feed for a number of hogs. This is a good object lesson of what may be achieved by a little capital and well directed effort. We have thousands of acres of such land awaiting the enterprising immigrant.

Respectfully submitted,
GEORGE MOORE.

EXTRACT from the ANNUAL REPORT OF THE FARMER'S CLUB OF BARNSTON IN THE COUNTY OF STANSTEAD.

There has not been any special experiments or essays made by any member of the club, during the past year, but there is great progress in agriculture generally. There is more than double the quantity of carrots, turnips, fodder corn, oats, pease and vetches raised now, for green food for cows in summer and autumn, than there was before our club was organized three years ago. This increased amount of feed has caused an increase of milk, both winter and summer.

And this increased amount of milk in winter, was the cause of creameries being built. During the winter of 1895 there was a first class butter factory built at Way's Mills, Municipality of Barnston. It is a joint stock company owned by the farmers of the municipality; there was also a butter factory started in Hatley the same winter, owned and managed by J. D. Morrison. Both these factories have been in constant operation since they were started and are doing a good business. In November 1896, Mr. G. B. Hall, of Barnston corner, started a first class butter factory. I was present at the first churning on the 24th November 1896. He is also doing a good business this winter. All this progress in agriculture and dairying, in the past two years, I attribute to the lectures given by the Farmers' Club, and I would make special mention of the lectures given by the Hon. Sydney Fisher and Mr. R. H. Pope: see my reports of lectures. I think there are six cheese-factories in the municipality, but I am not certain about the owners. See my report for cheese-syndicate of the county of Stanstead for season ending 31 November 1896.

I have the honour to be,
Your obedient servant,
W. H. DAVIDSON,
Sec.-Tres., B. F. C.

PLAN OF BARN, STABLE, COW-HOUSE &c.

(By M. J. A. Martin, Joliette)

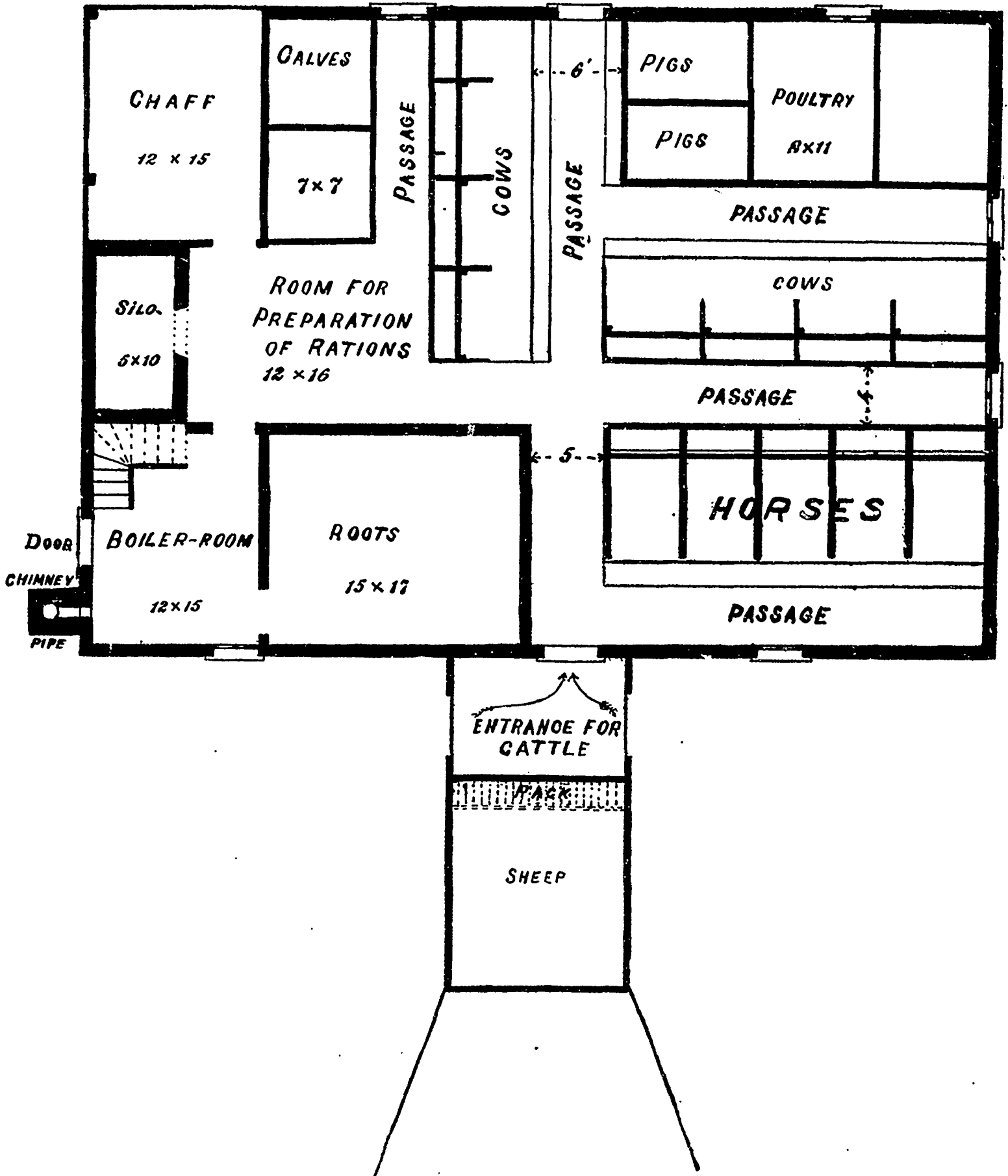
The Rev. Père Lacasse, agricultural lecturer, has sent us the following letter, accompanied by the plans of a barn, etc., which we publish on pp. of this number of the Journal.

BARN AND STABLE

42 x 60 feet.

By J.F.A. Martin, Joliette.

DUNG

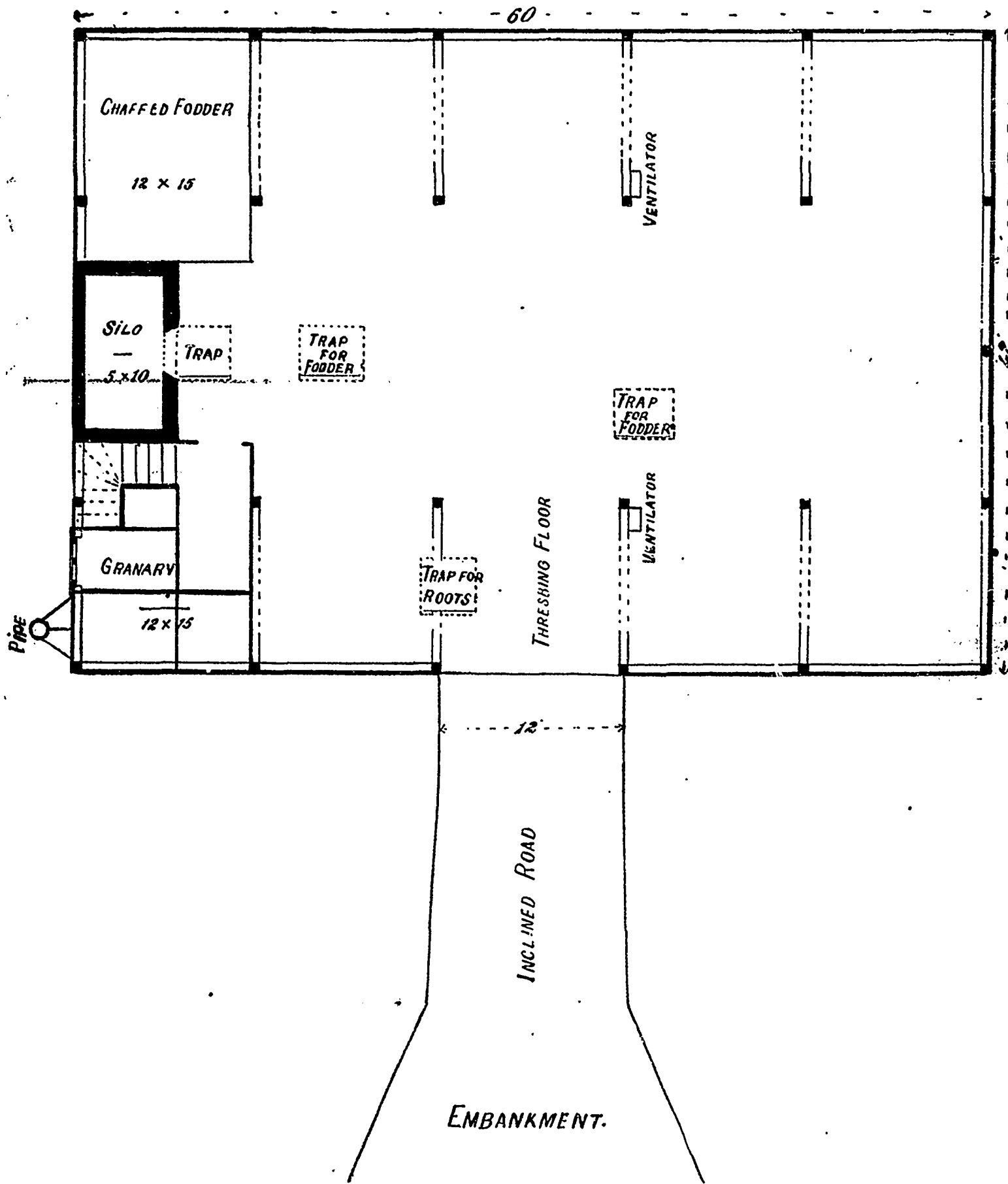


Division Plan--Basement--Cowhouse

SCALE--8 FEET TO THE INCH.

BARN, STABLE, &c.

By J. A. Martin, Joliette.



Division Plan—Upper Storey—Barn.

SCALE—8 FEET TO THE INCH.

Sir.—I send you a plan of a stable, barn, etc., invented by M. J. A. Martin, of Jollette.

Dr. Grignon and I were so much pleased with this plan that we thought it worth sending to you. We saw, at Ste-Marie Salomé, M. Ernest Gaudet's barn, built after this plan. He says that it is the perfection of convenience, and only cost him \$600.00 ready money.

M. Menier, the proprietor of Anticosti, is so pleased with this plan, that he has made up his mind to build one like it on his Island.

In the basement, there is room for 10 cows. It is easy to see how very easy it is to feed the horses and other stock in this barn.

The farmers of St-Jacques have been to inspect M. Gaudet's barn, and are determined to build theirs after the same fashion.

Bien à vous,
Z. LACASSE, ptre. O. M. I.

Farmer's Club of Coteau-du-Lac.—Experiment with a fertilizer on meadow land.—I the undersigned certify to having carried on experiments with plaster and ashes on a meadow 3 years old. The soil is light. On the 28th of April I worked it with an iron harrow, and then used a roller, weighing about 7.0 lbs. On the 9th of May, I spread 4 bags of ashes and a barrel of lime; on the 5th of June a bushel of plaster to which I added about 20 lbs. of superphosphate.

RESULTS.—The crops had a finer appearance, the plants being of a deeper green, this being more noticeable in the case of the clover than in that of the timothy. The yield was somewhat increased, probably about $\frac{1}{4}$ more.

The reason was very unfavorable.

JOSEPH PHARAUD.

Coteau-du-Lac, Sept. 30th., 1896.
(From the French by J. F. Haussen.)

To the Directors and Secretaries of Agricultural Societies and Farmers' Clubs.

We take the liberty to remind you that years' subscription to the Journal of Agriculture expires with the distribution of next June.

In order to avoid any delay to the members of the above associations in the receipt of the "Journal of Agriculture", we respectfully beg the secretaries to send as early as possible in May, to the address of the "Secretary of the Council of Agriculture," a list of the members who have paid their subscription for 1897.

Said list to be alphabetically arranged, and the edition either French or English, which each member desires to receive to be designated by "E" or "F."

Science.

ROTHAMSTED EXPERIMENTS.

SUMMARY ON THE FEEDING OF ANIMALS.

(Concluded.)

In introducing the subject of the feeding of the animals of the farm, attention was first called to the amount of the constituents of the crops grown in an ordinary four-course rotation, which would, if the grain only were at once

sold, be retained upon the farm for further use. In fact, for the production of meat, milk, and manure, and for the exercise of force. There will, as a rule, be a greater or less amount of grass in admixture with the arable land of the farm; and, according to its amount and other circumstances, there will, of course, be more or less stock food available in addition to that produced on the arable land. So far as manure is concerned, in some cases the grass land, and in others the arable, will be the gainer by the admixture of the two, accordingly as the one or the other receives back more or less than the amount derived from the consumption of its own produce. Then, again, the influence of the growing modern practice of selling more than the grain, and of importing cattle food and manure from external sources has to be taken into account. Nevertheless, the illustration derived from a consideration of the proportion of the constituents of the crops grown under a particular system of rotation which will probably be available for feeding purposes is not without interest and utility.

The facts and arguments which have been adduced may be very briefly summarized as follows: It has been shown that the amount of food consumed, both for a given live weight of animal within a given time, and for the production of a given amount of increase, is, as our current food stuffs go, measurable more by the amounts they contain of digestible and available nonnitrogenous constituents than by the amounts of the digestible and available nitrogenous constituents they supply.

That this should be the case, so far as the consumption for a given live weight within a given time is concerned, seems consistent enough when the prominence of the respiratory function in the maintenance of the body and the large requirement for nonnitrogenous constituents of food to meet the expenditure by respiration are borne in mind. But, at first sight, it seems less intelligible that the quantities consumed to produce a given amount of increase in live weight should also be much more dependent on the supplies of the nonnitrogenous than on those of the nitrogenous constituents of food.

It has been shown, however, that store animals may contain as much, or even more, of the nonnitrogenous substance—fat—than of nitrogenous substance, while "the bodies of fattened animals may contain two, three, four, or more times as much dry fat as dry nitrogenous matter." Obviously, therefore, the proportion of fat to nitrogenous substance in the increase in live weight of the fattening animal must be much higher than in the entire bodies of the animals.

Then, it has been further shown that the nonnitrogenous substance of the increase, the fat, is at any rate in great part, if not entirely, derived from the nonnitrogenous constituents of the food. Of the nitrogenous compounds of food, on the other hand, only a small proportion of the whole consumed is finally stored up in the increase of the animal. In other words, a very large amount of nitrogen passes through the body beyond that which is finally retained in the increase, and so remains for manure.

It is, therefore, only what should be expected, that the amount of food consumed to produce a given amount of increase in live weight, as well as that required for the sustenance of a given live weight for a given time, should, provided the food be not abnormally

deficient in nitrogenous substance, be characteristically dependent on its supplies of digestible and available nonnitrogenous constituents.

Again, it has been shown that in the exercise of force there is a greatly increased expenditure of the nonnitrogenous constituents of food, but little, if any, of the nitrogenous.

Thus, then, for maintenance, for increase, and for the exercise of force, the exigencies of the system are characterized more by the demand for the digestible nonnitrogenous or more especially respiratory and fat-forming constituents than by that for the nitrogenous or more especially flesh-forming ones.

In our paper "On the composition of oxen, sheep, and pigs, and of their increase while fattening," published in 1860, (1) we concluded that if fattening oxen were liberally fed upon good food, composed of a moderate proportion of cake or corn, some hay or straw chaff, with roots or other succulent food; if sheep were fattened under somewhat similar conditions, but with a less proportion of hay or straw; and if pigs were liberally fed chiefly on cereal grain, the increase would, with as much as 5 or 6 parts of total nonnitrogenous to 1 of nitrogenous compounds in the dry substance of such fattening food, probably be very fat. Further, that in the earlier stages of growth and feeding, a lower proportion of total nonnitrogenous constituents—that is, a higher proportion of the nitrogenous compounds—is desirable; indeed, that it is frequently the most profitable, having regard both to the rapidity of fattening and to the value of the manure, for the farmer to employ, even up to the end of the feed process, a somewhat higher proportion of nitrogenous constituents in his stock foods than is necessary to yield the maximum proportion of increase in live weight for a given amount of dry substance of food consumed. But that when the mixed fattening food contains less than about 5 parts of nonnitrogenous to 1 of nitrogenous compounds, the proportion of increase in live weight for a given amount of the dry substance of the food will not increase with the increased proportion of nitrogenous compounds consumed; while so far as these are in excess, the proportion of carcass in the live weight will probably be somewhat less, and the carcasses themselves will be somewhat more bony and fleshy, with less fat.

We at the same time pointed out, however, that the comparative values of food stuffs, even as such, could not be unconditionally determined by the percentage of the total nitrogenous and the total non-nitrogenous constituents; that it was necessary to examine more closely into the nature and condition of the proximate compounds of food stuffs to distinguish those which are digestible and assimilable from those which are not so, to determine the relative values of the comparable or mutually replaceable portions, and finally, to fix our standards of comparative value with more of reference to direct experimental evidence on the point and to existing knowledge of the composition of the animal bodies than had hitherto been usual, or even possible.

Since then an immense amount of labor has been expended in the determination of the digestibility of the individual constituents of various food stuffs, and the results so far obtained form a valuable contribution to our information on the subject. There is,

(1) Jour. Roy. Agl. Soc. England, 1st series, Vol. XXI, 1860, p. 433.

however, wide variation in the composition of different samples of nominally the same description of food. Then, the determinations of the amounts of the various constituents remaining undigested have generally been made with animals fed on limited supplies of food for maintenance only, and the experiments have frequently been made with the individual foods given separately. Great care and reservation are therefore necessary in the application of the results to actual practice. Thus, in the liberal feeding of animals for the production of increase it is generally economical to give within limits an excess of food, if a maximum result is to be obtained for a given live weight of the animal within a given time; and, in the case of animals liberally fed for the exercise of force, there will also generally be an excess of food given. It is obvious that, under the conditions of actual practice here assumed, greater proportions of the various constituents consumed will remain undigested than would be indicated by the figures representing indigestibility obtained under the usual conditions of experimenting on the point above referred to. Then there is the important consideration that conclusive evidence is still wanting as to the exact rôle in the system of some prominent constituents of food stuffs. For example, there is yet much uncertainty in regard to the position of the various amides, which enter so largely into the composition of feeding roots and hays; in fact, of all succulent and unripened products. Indeed, in the calculation of "nutritive ratios," the amides have sometimes been classed with the albuminoids, and sometimes in large proportions with the nonnitrogenous constituents. We have from time to time had the results of our numerous feeding experiments with both sheep and pigs calculated according to the published tables of digestibility. But the so-calculated "ratio" varied so considerably for different rations within the range of good practice that it would be misleading to attempt to give anything like a summary of the results and general conclusions therefrom, without full discussion, which would be neither appropriate nor possible on the present occasion.

In conclusion, as our current fattening food stuffs go, assuming of course that they are not abnormally low in the nitrogenous constituents, "they are, as foods, more valuable in proportion to their richness in digestible and available nonnitrogenous than to that of their nitrogenous constituents." As, however, the manure of the animals of the farm is valuable largely in proportion to the nitrogen it contains, there is, so far, an advantage in giving a food somewhat rich in nitrogen provided it is in other respects a good one, and weight for weight not much more costly.

AS TO AIR-SLAKED LIME.

EDS. COUNTRY GENTLEMAN.—The remarks concerning lime on page 208 may perhaps mislead those who are not experienced in the use of lime as a fertilizer. The term air-slaked, for instance, as used in contradistinction to hydrate of lime, is wholly misapplied. The practice among farmers who use lime more or less every year, as the rotation returns to the wheat and grass or clover seeding, is to bring the lime fresh from the kiln and take it to the field where it is to be used and drop it in suitable heaps at stated distances. Thus, if forty bushels to the acre—which

is the ordinary amount used is to be spread, the lime is dropped from the wagon in small heaps two rods apart each way, which, of course, gives one bushel to four rods and forty to the acre. The lime thus exposed to the dew and the moisture of the air becomes air-slaked, or as your correspondent—on the page above referred to under the head of lime—says, hydrated or caustic lime. These terms are all equivalent, for the lime is simply air-slaked by exposure to the air which contains sufficient moisture to reduce the lime to an impalpable powder, in a short time, without in the least affecting its caustic property. It is hydrate of lime unquestionably, and and as certainly it is air-slaked, which is quite a different thing from water-slaking, which cannot be done for this purpose without very great trouble and in a measure spoiling the lime for the use it is intended for.

The Flock.

(From "The Farmer's Advocate.")

QUESTIONS.

- 1.—Do you believe in keeping lambs, shearlings, and older sheep separate? If so, what are the advantages?
- 2.—Do you consider it well to confine sheep to pens all the time, or at nights, or do you allow them access to the yards and pens all the time?
- 3.—What is the character of your coarse fodder for sheep? (a) To what extent do you use pea straw? (b) To what extent do you feed hay? (c) How do you feed each or both, cut or uncut, in racks, troughs, or on the floor?
- 4.—What is your experience with feeding roots or ensilage to young sheep and to breeding ewes?
- 5.—To what extent do you recommend feeding grain to young or breeding sheep, not fitting for show?
- 6.—How much importance do you attach to keeping the pens cleaned out down to the floor?
- 7.—What do you recommend with regard to watering?

GIVE THE LAMBS A GOOD START.

- 1.—Yes, I believe and practice keeping the lambs in separate pens from shearlings and older sheep, for this season: Shearlings and older sheep crowd away the lambs from the feeding troughs and racks and the lambs do not get a fair share of the feed, and the first winter being a very important period in the life of the sheep, it is important that they should not be stunted or set back. Another reason is that I think it pays well to feed the lambs some grain the first winter, and if not kept separate the older sheep would get nearly the whole of it.
- 2.—Allow them access to the pens and yards at all times, except during severe storms; at such times close them in the pens.
- 3.—(a) If I have it, feed peas (1) twice in the day. (b) Feed hay once a day until the lambing season, then feed twice usually. (c) Feed pea straw sometimes cut, at other times uncut. Always feed the hay or pea straw in troughs or racks.
- 4.—Have not yet fed ensilage to sheep, but feed roots liberally to lambs and other sheep, except breeding ewes. (2)
- (1) Nitrogenous.
- (2) A few roots, with pea-straw and clover-hay will do. Ed.

My plan is to feed roots morning and night and grain at noon; rations being about one and one-half quarts of roots (pumped, sliced or whole) to breeding ewes and two quarts to other sheep; grain (if oats, which I think are best), put to a quart to each sheep; in lbs., would be about two pounds oats and three to four pounds roots each ration.

5.—Answered in No. 4. Think it pays well to feed lambs grain all winter, and breeding ewes should get some from the beginning of February until the lambing season.

6.—Think it injurious to sheep to allow the litter or bedding to accumulate until in sufficient quantities to heat. So long as the bedding is dry and no fermentation going on, do not think necessary to keep bedding cleaned away. (1)

7.—Sheep should have access to water at all times, particularly breeding ewes, except when fed large quantities of roots.

Think the above questions cover the ground pretty fully as to ordinary care of the flock during the winter season, except salting. The flock should be salted regularly at least once a week, or what is better, keep salt before them in boxes at all times. Another very important matter: The shepherd should examine his flock closely when going into winter quarters, and if infested with parasites, such as ticks and lice, see that the usual remedies are applied for their extermination. If this is not done a good deal of feed will be as good as lost and the owner may possibly lose some of the flock.

JAS. TOLTON.

Bruce Co., Ont.

HINTS FOR LAMBING TIME.

- 1.—We think that lambs should be kept separate from older sheep, as they do not get a chance while feeding with older and stronger sheep. Shearlings need not necessarily be kept separate, as they will generally feed and take good care of themselves until after lambing, when they will require good care and extra feed.
- 2.—No, it is well to confine them in pens at night, but allow them all the exercise they will take in daytime.
- 3.—Pea straw, clover hay and corn fodder, cut. (a) Feed pea straw twice daily to breeding ewes and once to young sheep. (b) Hay not fed for breeding ewes until after the lambing season has commenced; to young stock once daily when it is to be had. (c) We have the best satisfaction from cutting both, as the waste is not nearly so great; in racks, with good troughs.
- 4.—We find that young sheep can be grown very cheaply, principally on roots. We feed all they can eat, but only a very few to breeding ewes. Have fed no ensilage to sheep.
- 5.—About one pint of oats for young stock and one-half pint for breeding ewes along with a little bran when not fitting for show.
- 6.—We attach a great deal of importance to keeping the pens cleaned so as not to cause dampness or any foul smell, which is detrimental to the health of the sheep. Would also recommend plenty of pure air, although drafts should be avoided.

(1) Sheep would do better on bare boards with interstices $\frac{1}{4}$ inch wide, and raised about a foot from the ground. Ed.

7.—Breeding ewes should have a plentiful supply of fresh water; also young sheep where turnips or other roots are not fed, but where they can be fed freely they will drink very little. To those who have early lambs it will be necessary to have good, warm pens so as not to chill the young lambs. Do not feed too heavy for one week after lambing, as it may cause garget, the lambs not being able to take all the milk furnished. When they are two weeks old, a part of the pen should be divided so as to allow the lambs to eat by themselves. A little dampened bran and oats will be very acceptable to the young things. Care should be taken to keep them growing until able to turn out on grass, as a stunted lamb never amounts to much. The ewes should be well fed and a fresh supply of water provided daily, also salt should be regularly supplied.

A. TELFER & SONS.

Brant Co., Ont.

HOW TO MANAGE SHEEP FOR PROFIT.

- 1.—Yes, especially the lambs. They require better feeding to keep them growing till matured. This cultivates a tendency to early maturity in the flock. It evens up the lots, giving each sheep a better chance of sharing equally in the feed.
- 2.—I don't think sheep should be confined to pens. They should be allowed to go out and in yard at will. (1) Doors should be wide for the breeding ewes, to prevent possibility of injury from crowding. This often is the cause of abortion.
- 3.—Good pea straw cut a little on the green side for early winter feed (say up to 1st March) is excellent. I have found fodder corn with some fairly matured ears run through a cutting box, cut into half-inch lengths, a first class feed. After about the first of March, depending some on when the ewes are due to drop their lambs, I know of nothing to surpass early cut, well-cured clover hay. Prefer blue grass to timothy hay; prefer rack and trough combined.
- 4.—Have never fed ensilage. Young sheep may be liberally fed on roots at any time with best results. A small allowance may be fed to breeding ewes through the winter, which should be increased after the lambs are dropped to all they will eat up clean and no more.
- 5.—Young sheep should be fed just enough grain to keep them growing, and it should be such as to produce bone and muscle rather than fat, such as oats, bran, and oil cake (nutted is best). (2) Breeding sheep, when the coarse feed is of good quality and having a few roots, require but little grain until after the lambs are dropped, when they may be liberally fed on a similar mixture to the above.
- 6.—It is very important that pens should be cleaned out as often as is necessary to prevent the ammonia from escaping, which depends on amount of bedding, etc., used. In most cases twice during the winter is sufficient.
- 7.—Sheep require, perhaps, the least water of any kind of stock, but what they do want should be regularly supplied of the purest and very best quality (not a lick at a snowbank). If fed very liberally of roots they need less water. By a close observation of the above suggestions there is no reason why any man should not make a flock of sheep one of the most profitable investments on the farm. Sheep have touched bottom and are sure to rise.

JOHN JACKSON. (1)

Wentworth Co., Ont.

THE FLOCK.—It is now time to think about shearing the flock, and, as a preparation for this, we cannot too strongly recommend previous washing, and this for many reasons. 1. Because, if properly done it must clearly tend to free the skin of many impurities; 2. because the yolk or grease is a natural soap, and must wash the wool better than any artificial soap found in commerce; 3. because a Chambly manufacturer of woollen goods told us he never saw such wool delivered at his factory as were some fifty fleeces, that we had washed for the late Amable Demers, of Chambly Basin.

Of course, long woolled ewes and rams, like Leicesters, Lincolns, and Cotswolds, must be shorn early, and therefore the water must be heated for them. But all average sheep, Downs, and natives, can well wait till June, and a large tub, placed by the side of a stream or pond will do very well to wash our small flocks in. The water tub, should be kept constantly full, but not wasted, so to speak, as the natural soap it derives from the wool of the first sheep aids to cleanse the wool of the next. The sheep should be penned in the corner of a grass-field of some kind, and, a dry day having been selected, they should be driven into the pen early, with their lambs, if any, care being taken not to take them along a dusty road, and that for obvious reasons.

In order to allow of the yolk rising, the shearing ought not to be done till about ten days after the sheep were washed. Those who have not tried this plan, will be surprised to find how much easier the fleece comes off the sheep's back than when they are shorn unwashed.

After shearing, when any wound that may have been unavoidably made has thoroughly healed, the sheep should be "dipped" in a composition made for that purpose. Mr. Gray, druggist, St. Lawrence Main Street, Montreal, can supply the stuff. We can recommend Biggs' and Lawes' "dips" as being, both of them, reliable, though, doubtless, there are some dips made here that will answer as well.

If any of our readers farm in a wooded district, where the fly is troublesome, it may be well for them to inspect their flock twice a day, as a fly soon gets through its work, the eggs soon hatch, and the maggots commence the work of destruction without loss of time. Caps, to tie over the head, under the neck, are good protectors, but a cap should never be put over a sore head, as it would conceal the progress of the wound.

If foot-rot invades the flock, close paring of the hoof, and the dressing of the part between the "claws" with butter of antimony or other caustic, is the only treatment worth a farthing.

(1) Mr. Jackson is a breeder of first rate Southdowns, and "knows all about it." Ed.

(1) Right. Ed.

(2) What is "nutted"?

The Horse.

BREEDING AND USING HORSES.

Horses too small here - English horses
- Duke of Portland and his tenants - Government grants.

General want of thorough cultivation on Quebec farms due to want of proper horse power to work agricultural machinery. This is a greater drawback to thorough cultivation, than anything else owing to shortness of seasons in this Province. Would be a great benefit to farmers if, some means were provided by which they could breed a good stamp of agricultural horse cheaply.

Applying manure without cultivation is not farming. Thorough cultivation, according to old Jethro Tull's system, without any manure at all, would produce far better results. And we should have fewer weeds. Under our conditions of climate and seasons, with an abundant supply of agricultural horse machines to be had, on easy terms of payment, I think that thoroughly efficient horse power may be said to be the most important factor in thorough cultivation. The full superiority of horse power over good manual labour, to be correctly estimated at its true value, should be that of good horse power, not bad, or indifferent.

And, in this province, where our farm work has, perforce, to be got through with in a very short space of time, where our farms are all of the most undesirable shape, as far as sowing time in getting from one part to another is concerned, we want quick stepping horses of sufficient power rather than very slow ponderous ones. We require the most efficient horse power, for all our horse implements, more here, than in any other climate or country that I know of, if we want to make sure of getting our tillage thoroughly well done and at the right time. That and draining, I should put manure, and the application of it, with the exception of top-dressing, in the third place, as it is a waste of valuable matter to put it on land untilled, and undrained. In our peculiar climate, Spring and Autumn, exist only in the Almanack, and we jump from winter into summer, and from summer into winter, and there is after, nearly always indeed, barely enough time to get our so-called Spring and Autumn work, completed to the satisfaction of a thoroughly good farmer. And, we should all try to be thoroughly good farmers, if we can.

Until our French Canadian farmers learned how to take better care of their cows, there was not much pretence at dairying in this Province.

They take better care of them now, and feed them better, but they do not yet know or care to breed a good cow. Grass fed horses with very often not even a small feed of oats at midday, during autumn ploughing, will not do good work, and cannot get it done in time. As a rule, here, the horses are turned out of the plough, into the pasture, to shiver through a cold Autumn night, and caught again in the morning, to work off their stiffness in the plough. Is it any wonder that they take a long time to get to the end of a furrow? I have seen more than an equal amount of ploughing, in the same kind of soil,

done by one pair of strong active, well-fed, and well-bred horses, weighing about 1300 lbs, in the same time, than by two, and occasionally, three pairs, of undersized half starved animals.

Canadians who have been on English farms have expressed surprise, at the number of horses used for some particular work, and the, to them, extraordinary care taken of them.

This may sometimes appear to be the case, but then you may be sure that there is never any fear of the work not being efficiently done, and they are all strong, well fed horses, in good condition. The only reproach the good old American farmer can make on this score to the English one, is that his work is sometimes needlessly well done, that less labour or tillage would have been sufficient to produce an equally effective result. The English farmer does not think so, and does not mind keeping a horse or two more, than he does absolutely want, if he feels he can afford to do so. Besides, very often this extra horse is a mare, a good blood mare of her class, who can be relied upon to bring in a recruit to the ranks of the workers, in proper time when required, or put an occasional tidy sum into the farmer's pocket. It is curious that although we may less horses at work, at the same time, on a Canadian farm, that there are a great many more in proportion to the size of the farm, only they are of hardly any value, and of very little use.

Upon any farm of hardly more than a 100 acres, it is quite common to see 4 or 5 horses in different stages of decrepitude, and as many more worthless youngsters in different periods of uncharitable coldhood, when two or three good sound animals of sufficient size, would be sufficient, and could do the work much better.

At the last meeting of the S. I. L. (1) Dr. Couture emphasized the unfortunate fact that the Province of Quebec had adopted the principle of refusing any sort of Government aid for the improvement of live stock of any kind. In Ontario, on the contrary, breeders received an annual grant of \$10,000.

The Society passed a resolution, begging the Provincial Government to vote a grant to the Society of Breeders of the Province of Quebec, in each section, in order to effect improvement in our different classes of live stock.

The object to be obtained, of course, is, presumably, for the conferring of the greatest benefit on the greatest number. We want of course to do something that will begin to make it possible in time for every farmer in this Province, or most of them, to have good stock in his farm instead of bad; by affording him the cheapest means of building it up gradually. And anybody that has experimented with a pure bred bull and a herd of grades, knows that it does not take very long to do this. A good deal of the benefit to be derived from the voting of any sum of money devoted to such a purpose, depends upon the method of its employment. I think that we have seen that in former days. Still, I do not think that it is a matter to be left solely to private enterprise or that private enterprise should be rewarded by anything in the shape of prize money. That would not be of much use to the ordinary farmer nor will special or extra prizes at agricul-

(1) I. e. The Dairymen's Association.

tural Exhibitions do any good. We have enough of these already for the class of people, who avail themselves of this method of advertising, for the sake of which, they do not mind spending 50 dollars to gain a 20 dollar prize.

We have private individuals of much enterprise in this Province, who are breeders of valuable strains of thoroughbred stock, but the results achieved by their private enterprise, however successful to themselves, are not of any benefit to the ordinary farmer. They naturally prefer to sell their stock at the highest price obtainable in the best market.

Where do most of our best Jerseys and Ayrshires go?

To the United States, and not on to our Quebec farms, or if they do, certainly not at farmers prices.

There is no duty on thoroughbred stock for breeding purposes going into the U. S. and the expenses of transit from here, are not greater than from many parts of the U. S. to others. In many countries in Europe, certainly in France and Germany, farmers receive most valuable assistance, in the way of obtaining the services of thoroughbred sires at very low figures, and in England farmers have always been able to benefit by most liberal arrangements on the part of wealthy landlords, and do so continue to benefit, even in days of hard times for land owners.

Take the Duke of Portland's propositions to his tenants on the Welbeck Estate for instance.

"The Duke of Portland will provide at his own cost a limited number of sound mares for breeding purposes and distribute them amongst certain of his tenants chosen after application for same, under following conditions. The mares can be ridden or worked in the ordinary way in connection with the farm.

"Mares to be covered every season by one of the stallions provided by his grace, or by any other approved thoroughbred horse. On a mare proving in foal, it must only be lightly worked prior to date of foaling, and not for two months after foaling. Returns of foals to be made every year and of barren mares.

"The Duke of Portland will allow the tenant the use of the mare for three years at least, but she will be liable to be removed from the care of the tenant at any time, should his grace consider such a course advisable. The Duke of Portland requests that each mare be exhibited at the Welbeck Tenants' Show and 1st 2nd and 3rd prizes will be given by him to the animals considered to be in the best condition for breeding, by a competent judge. Each tenant accepting a mare on the foregoing conditions will keep her entirely at his own expense, and will further give the Duke of Portland the first refusal of the produce up to three years old, at a fair price.

"If his Grace decline to purchase, then the tenant is at liberty to dispose of the produce, as he may think fit, but, he would prefer the fillies were retained, to breed from in after years, as his sole object is to encourage a better class of half bred animals on his estate. The Duke of Portland would strongly urge tenants to give especial care to their foals, the first year, so as to make them more valuable afterwards. It is to be distinctly understood the mares provided by his grace, belong to him, and although they may be worked as men-

tioned, they are lent to the tenants for breeding purposes." We do not want to tempt farmers to lose money in trying to breed winners of big Government prizes, nor would any good be done in that way, but in the absence of any sort of private enterprise, of the value of the Duke of Portland proposition, with the fairness of which, there is not much to be found fault with, it is perhaps not unreasonable, that those who take a great interest in the improvement of live stock in this province, should expect that a Government, that professes very highly indeed to favour agriculture, should do as much for one of its most important branches, as they do in Ontario.

C. F. BOUTHILLIER.

PATENT REPORT.

Below will be found the only complete up to date record of Patents granted to Canadian Inventors, which is specially prepared for this paper by M.M. Marion & Marion, Solicitors of Patents and Experts, Head Office: Temple Building, Montreal, from whom all information may be readily obtained.

- 55,091—D. Colleen, Inwood, O.—Car Coupler.
- 55,095—F. L. Barthelmes, Toronto, O.—Wood Pulley.
- 55,096—G. T. Laird & J. K. Gould, Mont Pleasant, O.—Feeding Troughs.
- 55,105—S. J. Schneider, Toronto, O.—Sheet iron stove.
- 55,118—W. Hayes, T. W. Double & H. F. Klipp, Tilsburg, O.—Storage door.
- 55,124—J. B. E. Rousseau & J. Boulet, Québec.—Leather cutting Machine.
- 55,125—I. Fréchette, Montreal.—Machine for making endless wire nails.
- 55,153—F. R. Edwards, Thurso, P. Q.—Rowlocks.
- 55,138—John Lee, East Toronto, O.—Safety controlling device for automatic air-brakes retaining valves.
- 55,142—J. G. Legrand, Montréal.—Ore washing machine.
- 55,143—D. Blondeau & H. H. Gaudry, Québec.—Combined inkstand with envelope and cigar cutter.
- 55,147—W. Chipman & R. Lemox, Ottawa.—Vehicles wheels.
- 55,149—G. E. Green, Assiniboia, Ont.—Machine for moving stone, earth, etc.
- 55,153—H. M. Gardner, Hamilton, O.—Combined Grocers' package, Grater, Slicer, Mouse and Fly Trap.
- 55,162—J. A. Manning, Toronto.—Excelsior packing.
- 55,167—W. L. Marshall, Port Perry, O.—Harrows.
- 55,182—A. Green, Abingdon, O.—Road carts.
- 55,183—Jas. Ingells & M. Birkett, Brantford, O.—Churns.
- 55,191—W. A. Cowan, Middleton, O.—Stove pipes.
- 55,198—Jos. Edward, Smith Falls, O.—Weather strip.
- 55,200—J. Braithwaite, Winchester, O.—Curd cutting mills.
- 55,204—J. F. Ross, Toronto, O.—Self sealing cans.
- 55,208—Henry Morris, Walkerville, O.—Guard rails.

Special Notices.

A Dandy Windmill, Make it Yourself.

I have a neighbor that made one of the People's Windmills, and I have been watching it closely, it is the best mill I have ever seen and anyone can make one for less than \$10. I am going to make two immediately and don't see why every farmer cannot have a windmill when he can make it himself for so little money. The mill is durable, powerful and runs easily. Any person can get diagrams and complete directions by sending 48 two-cent stamps to Francis Casey, St. Louis, Mo., U. S. A., and an active man can undoubtedly make money anywhere putting these mills up for others, and I see no use of paying \$50 or \$60 for a mill when you can make one just as good for \$10
A BROTHER FARMER

That Wonderful Churn.

I want to add my testimony to the list of those that have used the Lightning Churn. It does all that is claimed for it, you can churn easily in one minute and get a large percentage more butter than with the common churns. I never took the agency for anything before, but so many of my neighbors wanted churns that I ordered 30 and they are all gone. I think in a year every farmer will have a Lightning Churn, in fact they can't afford to be without one as they make so much more butter and a good little bit of money can be made in every township selling these churns. By writing to J. F. Casey & Co., St. Louis, Mo., U. S. A., you can get circulars and full particulars about the churn.
A BROTHER

THE BEST BUTTERMAKER

Cannot Make Fancy Butter
If Poor Salt is Used.



IS THE
"PUREST AND BEST"

And cost no MORE THAN inferior Salt.
For sale by all the leading Grocers in the Dominion.

WINDSOR SALT CO., Limited,
WINDSOR, ONT.

ATTENTION

Bee-keepers

Bee-keeping may be made very profitable if rightly managed.



Everything in the line of Bee-Hives, Sections, Comb Foundations, Honey Extractors, Smokers, Italian Bees etc., etc.

Largest Stock and Best Goods at Hand. Times Prices. Special Offer: To more fully introduce them, I will send a sample of my Improved Model Bee-Hive, taking 2 regular Langstroth frames, completely nailed, not painted for \$1.40. Clark Smoker and Sample Hive, \$2.00. 3 Sample Hives, partly nailed, with nails to finish, \$4.00, with Smoker, \$4.60. Illustrated Circular and Price List Free.

F. W. JONES,
Bedford, Que.

GET THE IMPROVED 1897

Alexandra
Cream Separators.

POWER SIZES	HAND SIZES
BELT AND TURNING	EASY RUNNING
Prices: \$160 to \$410	Prices: \$60 to \$120
Capacity: 650 to 2000	Capacity: 175 to 650

Estimates Supplied for Creamery Outfits.
Several Second-Hand Separators. All makes.

Sargains - In Perfect Order. - Power or Hand Sizes. From \$25.00 up to \$250.00.

The Dominion Dairy Supply Co.

J. de L. Taché,

HEAD OFFICE: Scott-Junction, Que.
Quebec Office: St. Hyacinthe Office: At Taché & Desautels.
L. J. Belleau.

FOR SALE or EXCHANGE

A Good Thoroughbred Cow. A Registered Ayrshire Bull Calf May 15th 1896. Also a few of Black Minorcas. All of first class stock at reasonable prices.
G. H. HUR, Côte St-Laurent,
or F. O. Box 719, Montreal.

IT IS FREE

Our booklet, "Paint Points," will help you in deciding what is the proper paint to use for your cupboards, baseboards, shelves, floors, luggies, wagons, boats, farm implements, barns, fences, chairs, houses—in fact, anything that can be painted.

There are great differences in paints. Some give a bright, glossy finish, others an oil finish that can be washed. The secret of painting is to know the right paint for your purpose, then use it. The old zinc bath tub is an eye sore. You can make it look like porcelain, and wear like porcelain if you use

THE SHERWIN-WILLIAMS BATH ENAMEL

"Paint Points" tells what you want to know about paint. Tells the good and the bad points about good and bad paint. Tells about the brushes to use, and how to take care of them.

THE SHERWIN WILLIAMS PAINTS are made for every purpose, not one paint for all purposes. Send for the booklet to-day—it is free. For booklet, address 1 St. Genevieve Street, Montreal.

THE SHERWIN-WILLIAMS CO.
CLEVELAND
CHICAGO
NEW YORK
MONTREAL

BINDER TWINE

CONSUMERS CORDAGE COMPANY Limited
MONTREAL, CAN.

All up to date Farmers use Binder Twine, made by this Company, and won't use any other.

STANDARD BRANDS: Blue Crown, Standard, Red Crown, Blue Ribbon, Red Cap, Sterling.

Once used, always used. Why? Because it is the only Twine that will allow the Farmer to ride all day long on his Binder without stoppage, and consequently will do more and better work than any other.—There is none "Just as Good."

The Longest Row

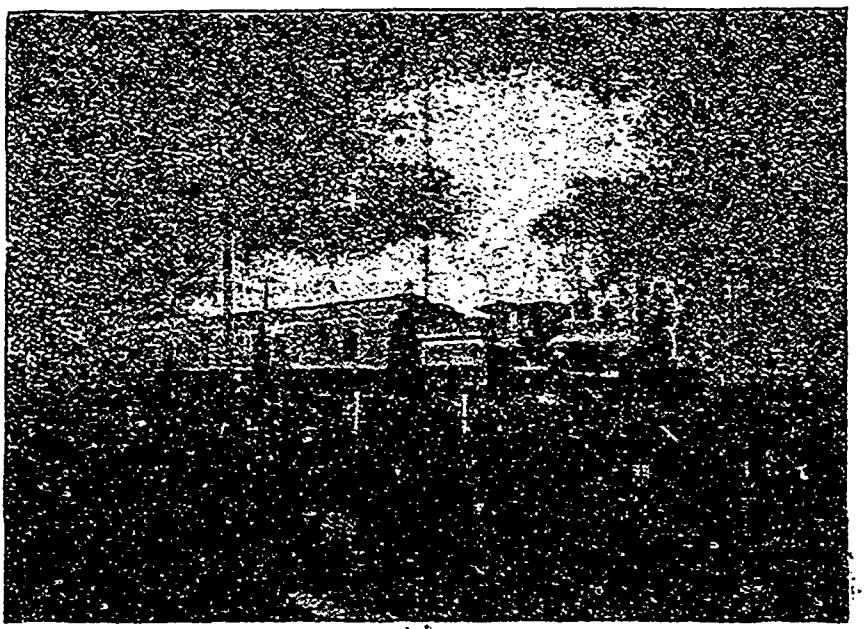
is shortly hoed with the "PLANET JR." No. 15 Single-Wheel Hoe. Has Cultivator, Rake and Plow attachments. Quickly converted into a hill or drill seeder by a seed dropping and sowing attachment—sold separately. Almost any of the twenty "Planet Jr." Farm and Garden Tools will do the work of six men. If you make money without them, you'll get rich with them. "Planet Jr." hoe, for 75c, is ready and costs nothing—write for it.

S. L. ALLEN & CO., 1107 Market St., Philadelphia.

HATCH Chickens BY STEAM with the MODEL
EXCELSIOR Incubator

Simple, Perfect, Self-Regulating. Thousands in successful operation. Lowest priced First-class Hatchery made. GEO. H. WATKINS, 114 to 122 S. 6th St. Quincy, Ill.

Wm. Wylie, Howick,
or 228 Bleury St., Montreal.
BREEDER OF HIGH CLASS AYRSHIRE.
A few choice Young Bulls and Heifers for sale, at moderate prices.



This fence is just as suitable for farm use as for railways. Although there are hundreds of miles of it in use on Canadian railways, there is several times as much on the farms. If you are interested in fencing, write the Fago Fence Co. Ltd., Walkerville, Ont., and they will gladly send you some good reading matter well illustrated Free.

Hops.

In hop culture the margin of profit is now very narrow. Those growers who treat their hop fields to liberal doses of fertilizers containing not under 8% actual

Potash

find themselves on the profitable side. Improved quantity and quality always result.

All about Potash—the results of its use by actual experiment on the best farms in the United States—is told in a little book which we publish and will gladly mail free to any farmer in America who will write for it.

GERMAN KALI WORKS,
93 Nassau St., New York.

LEMIRE
STONE & STUMP LIFTER

Patented 1894.
Capacity of Lifting 18,000 lbs.
(With no equal.)

Lifting and carrying stones at will, so you can make with them fences from 4 to 5 feet high. When buying this strong and durable machine, you can make your fence with big stones instead of buying spike wire for fences. You will clear your land for the mowers and reapers. To lift a stone you make the lever work and the hooks will hold it when lifting. You can lower it in the same manner or make it fall by touching a ring fixed in the wheel. You can lift, remove and put into fence a stone in 10 minutes. Agricultural Societies should buy it. Farmers if they like may join in club to buy it. Price moderate. For all particulars address to

A. LEMIRE, Proprietor, Wotton,
Or at the Plessisville Foundry, Somerset.

BEE-KEEPERS
SUPPLIES

NEW PROCESS COMB FOUNDATION
STRONGER AND BETTER.

Bees and Queens.

Circular and sample copy "Canadian Bee Journal" free.

ADDRESS:
Goold, Shapley & Muir Co., (Ltd.),
BRANTFORD, ONT.

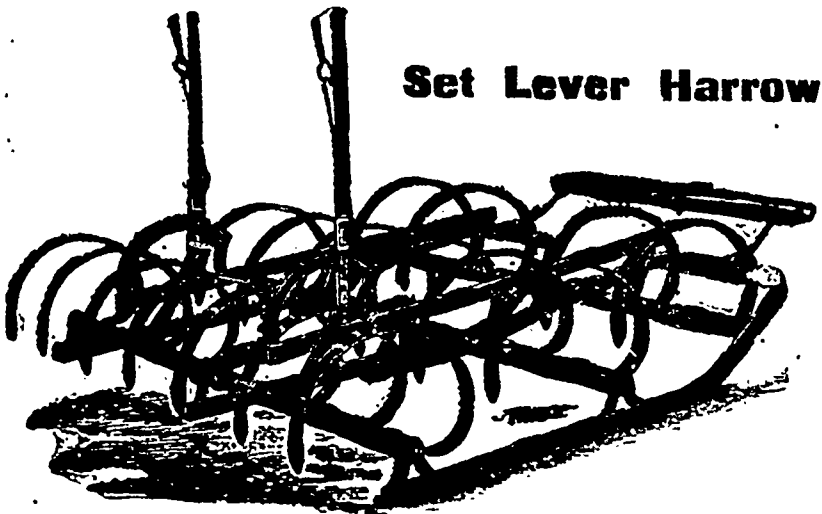
DAWES & CO., LACHINE, QUE.

BREEDERS OF
Pure Bred Horses,
Ayrshire and Jersey Cattle,
Berkshire and Yorkshire Pigs.

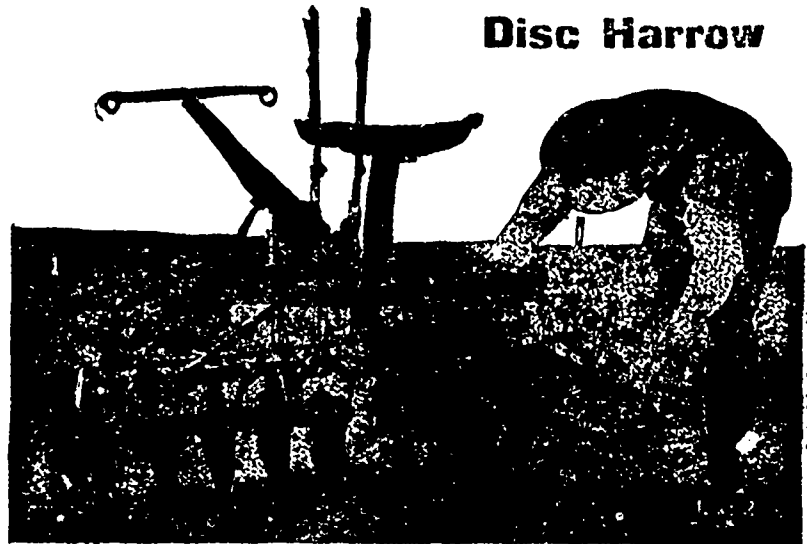
CANADIAN OFFICE & SCHOOL FURNITURE CO.
PRESTON, ONT.

THE BANK OF CANADA & THE BANK OF MONTREAL
OFFICE, SCHOOL, CHURCH & HOUSE FURNITURE
SEND FOR CATALOGUE

Moody's Labor Saving Farm Machinery



Set Lever Harrow



Disc Harrow

Our Set Lever Harrow is the best spring tooth Harrow in the world. It is made of more expensive material than the other harrows on the market and is therefore somewhat higher in price than the cheap harrows. The difference in price is however more than made up by the difference in quality. Convince yourself by examining them.

Our Disc Harrow is the best machine of its kind on the market. Its superiority is so great and self evident that we are ready to place it alongside of any other disc in the market with full confidence in the result. It cuts an even depth under all circumstances, and the gangs have great flexibility. It is both an inthrow and also an outthrow machine.

Our Seeders.—We have them for one horse for sowing only both grain and grass seed, that is without any harrow teeth. This machine will sow 9 feet wide. We have also our regular 4 section Seeder with improvements added for this year. This machine is well known and is guaranteed to be first class in every respect.

We are sole agents for Province of Quebec for the celebrated WILKINSON PLOUGHS AND SHARERS, and are keeping a stock of their repairs as well as their machines on hand. You can get them through our local agent.

MATTHEW MOODY & SONS,

MONTREAL OFFICE: 10, 12 and 14 LeRoyer St.

TERREBON, B. QUE.

FARMERS, GARDENERS & FLORISTS

SHOULD USE THE

Nichols Chemical Co.'s Fertilizers.



It increases crops from 25 to 40 per 100 and in many instances doubles them. POTATOES are much less liable to rot. CORN yield more. TURNIPS, BEETS, VEGETABLES mature earlier, give greater returns when these Fertilizers are used. HAY and GRAIN of all kind are greatly improved.

NO BAD WEEDS, or FOUL SEEDS, go with them like farm yards manure.

Every one who cultivates Flowers, Garden or Field, should use them.

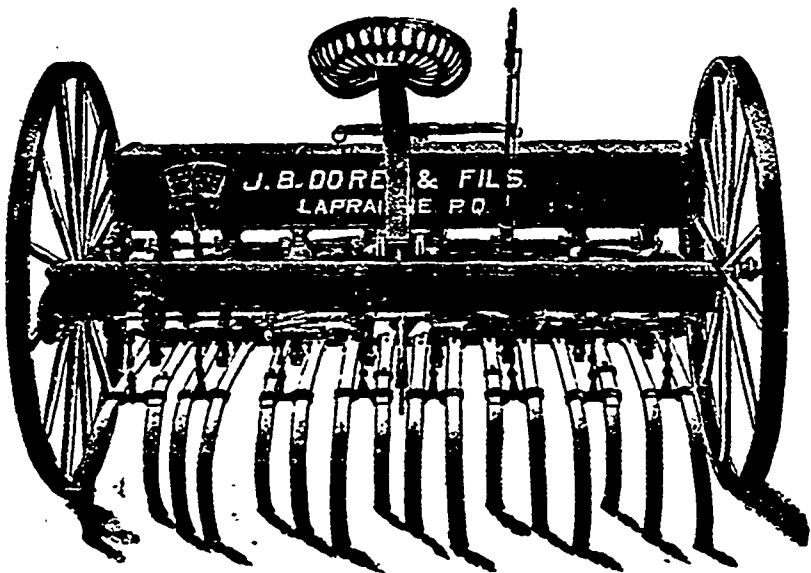
2000 Farmers will tell you it pays 100 per 100 to buy those Fertilizers.

Selling Agents:

R. J. LATIMER, Montreal. P. T. LEGARE, Quebec.
F. L. BEAN, Sherbrooke.

New Model of Cultivator and Seeder.

The only Eight Section Cultivator on the Market.



The most perfect Cultivator ever made, for food, would not break the grain. Sows to perfection. Teeth raise higher than any other, light to draw and operate. Will make better work on uneven ground, will cultivate the knolls and holes at even depth, and will leave the ground in better shape. See it before placing your order. Warranted in every way.

Agents wanted where territory is not given. Catalogue sent free.

J. B. DORE & SON,
Manufacturers, Laprairie, Que.

MICA ROOFING

USE

USE

MICA ROOFING

On all your buildings.

It is cheaper than shingles.

Waterproof and Fireproof.



MICA PAINT

To Repair Leaky Roofs.

Shingle, Iron, or Tin Roofs painted with it will last twice as long.

Rapidly taking the place of Shingles.

Is put up in rolls of one square each, 40 feet long by 32 inches wide, and costs only \$2.25, including nails, thus affording a light, durable, and inexpensive roofing, suitable for buildings of every description—especially flat roofs—and can be laid by any person of ordinary intelligence.

HAMILTON MICA ROOFING COMPANY, Office—101 Rebecca St., Hamilton, Ont.

TO IMPLEMENT DEALERS . . .

Fleury's Plows,
Medal and Diploma at Worlds
Fair for

EXCELLENT DESIGN
and GOOD WORKMANSHIP

Cultivating Implements and
Stock Raisers' Machines.

The LARGEST and BEST Line
in Canada.

Write us. Catalogue on request.

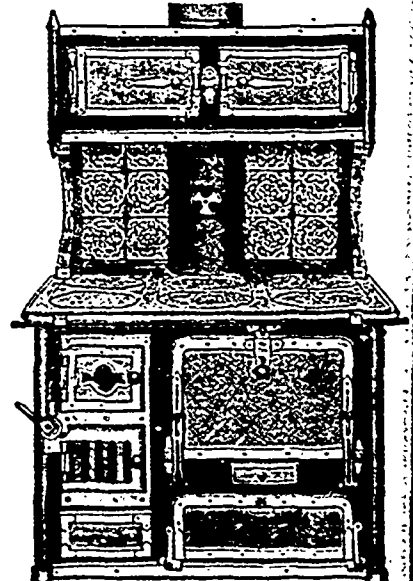
J. Fleury's Sons,

R. AURORA, (near Toronto).

COLEMAN'S Celebrated Table and Dairy SALT

The Canada Salt Association,
CLINTON, ONT.
Guarantee prompt shipments.
Fine, Coarse, or Land Salt.
For Table or Dairy use.

17 IS IMPERIAL



This Range is fitted with our patent elevating grate which can be raised or lowered, making fire larger or smaller; thus saving time, money and fuel. Call or write for Catalogue, to
John Burns & Co., Manufacturers,
775, Craig & 2599 St. Catherine St., Montreal

SPRAYING PUMPS

Our New Spraying Pump is the latest and best, per feet distribution. Strongly made of best materials and moderate price. Agents wanted. Send for circular of full lines of Spraying Pumps.

J. A. McMartin & Co.,
NATIONAL PUMP WORKS,
64 St. George St., Montreal.

NOTICE

So as to obviate any misunderstanding we cancel the offers of apple-trees as prizes, which were made for the Spring of 1896 only.
The Rev. Trappist Fathers, Oka, Ont.