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AGRICULTURAL REVIEW.

MARCH, APRIL.

CONTENTS:—Official Department.—Meeting of the Board of Agriculture for Lower Canada—Re-election of the retiring members—Culture of the Vine, by M. Courtois—Second Society granted in Loblino—Petition of Verchères Agricultural Society No. 2—The coming Provincial Exhibition in Montreal—Rimouski Agricultural School—The Elements of Agriculture, by Mr. Smith—Presentation to the Board of Agriculture for Lower Canada, by the Emperor of the French, of a Percheron Stallion, of a Norman coach horse, and of several Merino sheep—Importation of improved machinery for the preparation of flax and for its conversion into tow and thread—Importation of Flax and Hemp seed for distribution—A new Model Farm—The Lower Canada Agriculturist.—**Editorial Department.**—Agricultural College of the State of Pennsylvania—As a purely Educational Institution—As a Practical Institution—As an Experimental Institution—As a means of protecting the Industrial Interests—Buildings—Course of Study—First, Second, Third, Fourth, and Fifth years—Auxiliaries to Study—Conditions and form of admission—Agricultural College of St. Thérèse—Buildings—The Agricultural Course—Conditions of admission—Agricultural and Veterinary Institution in Toronto—The subject of Landed Credit—The advisability of establishing a "Banque de Credit Foncier" upon a solid basis—The practicability of the scheme as applied to Lower Canada, and the principles upon which it should be applied.—**Farm Operations.**—Maple sugar making—Calendar of Operations for April—Farm—Buildings—Cattle—Cellars—Clover—Drains—Farm accounts—Fences—Grain—Grass Seeds—Hired men—Horses—Ice-houses—Manure—Potatoes—Poultry—Seeds—Sheep—Swine—Tools—Orchard and Nursery—Apple trees—Scions—Evergreen Trees—Grafting—Insects—Manure—Pear trees—Pruning—Small fruits—Transplanting—Kitchen and fruit garden—Artichokes—Asparagus—Cabbage—Cold frames—Cucumbers—Fruit trees—Grapes—Lettuce—Onions—Peas—Small fruits—Flower Garden and Lawn—Box Edgings—Green and Hot houses—Grapery and Orchard-house—Apiary in April—Report of the Hemp and Flax Encouragement Society, by Wm. Bon—Some Sorghum items—The crop of 1862—Good crops follow good culture—How much Sorghum pays—Paper from the Beagoo—About seed for 1863—The best soil for Sorghum—How to get sugar from Sorghum—Home-made manure.—**Breeders' Department.**—Rules for management of Cows—Early care of fattening animals—Over working of young horses—Injury of the foot of a horse from a nail—Sheep and wool—Rule to determine the weight of animals—Change of pasture—The value of a dead horse.

BOARD OF AGRICULTURE FOR LOWER CANADA.

QUEBEC, 11th March, 1863.

Present:—The Honorable the Minister of Agriculture, Hon. L. V. Sicotte, President; O. E. Casgrain, Vice-President; Hon. J. U. Tessier, Hon. E. Turcotte, M. E. E. Campbell, C. Taché, F. Ossaye, Professor of Agriculture at Normal School, Jacques Cartier; Rev. Langevin, Professor of Agriculture Normal School, Laval, Rev. F. Pilote, Professor of Agriculture at Ste. Ann's College, Kamouraska; J. Smith, Professor of Agriculture at the Agricultural and Industrial School of Rimouski.

The President took the Chair. The official report of the Minister of Agriculture, indicating the result of the election of the members of the Board for 1863 was read. The Board then proceeded to elect a President and Vice-President.

Moved by Hon. E. Turcotte, that Hon. L. V. Sicotte be re-elected President. (Agreed.)

Moved by Hon. E. Turcotte, that Major E. Campbell, be elected Vice-President. (Agreed.)

On a motion of Mr. C. Taché, it was resolved:—That this Board, after satisfactory proof of Mr. J. Smith's qualifications as Professor of Agriculture of the Industrial and Agricultural School of Rimouski, admit Mr. Smith as one of the members.

The President laid before the Board a letter from Mr. Grant, enclosing two copies of the Report of the Special Committee of the Agricultural Association of Ireland, on the culture and preparation of flax. This letter was sent through the medium of Er. Watkins.

The President submitted the following Report of Mr. Pilote.

Report on the use of \$100 given by the Board of Agriculture of Lower Canada, to the Model Farm of Ste. Anne for the encouragement of the cultivation of flax and hemp.

To the Hon. President and Directors of the Board of Agriculture of Lower Canada:

Gentlemen,—The trial which you wished to encourage at Ste. Anne has not had all the desired success. It has been impossible to sow hemp seed last spring. The flax seed did not arrive till the first days in June, consequently too late to prepare a crop to steep the flax in the ordinary way, by exposing it on the grass

thin layers.

The seed was purchased from Messrs Lyman & Co. of Montreal, through the medium of the Central Society at the price of \$19 for five bushels, one of which was of Riga. The whole has not been sown; what remains is kept in reserve for next year.

The 7th of June we sowed three quarters of a bushel on a piece of land of 1 arpent and 4 perches, which had been improved by the ordinary process of a good cultivation. The half was seed from Riga, the other was the ordinary flax. Notwithstanding a continued dryness, this piece of land yielded 110 large bundles of beautiful flax, $3\frac{1}{2}$ feet long for the Riga and $2\frac{1}{2}$ for the other kind; fifty-five bundles of Riga yielded 4 bushels of seed and 55 bundles of the other 5 bushels.

I gave a few gallons of the same seed on trial to two friends in our vicinity and the result was about the same as the above. Several of our neighbours intend to cultivate more flax for the future. I am in duty bound to observe here that the lectures given last summer, by Mr. Ossaye, have largely contributed to diffuse here the love of this cultivation.

The scutching machine which has been deposited here last spring, has not all the requirements for its immediate operation. The trials which were made have had sufficient success, but in order that the operation be made with continued velocity and without fatigue, it must be moved by other powers than strength of arms; I have been unable to get the proper instrument for this purpose. I have adapted to this machine a temporary wheel five feet in diameter having two handles attached to it. Two men suffice to put this machine in operation without much fatigue, provided the work does not last a very long time.

This machine comes from the workshop of Mess. J. Rowan and Sons of Belfast, in Ireland. It is destined for flax only, being two weak for hemp. The proprietors therefore offer it to the public only as "a new patent scutching machine." From the printed directions for its use, with a velocity of 400 revolutions to the minute for ordinary flax, the machine may yield from 25 to 35 lbs of a very fine tow.

I have thought, Gentlemen, I was acting in

accordance with your ideas; and favour the laudable efforts which you make to encourage the cultivation of so useful a plant, by subscribing \$20 of the money which you have been kind enough to place at my disposal, here to help the *Central Society* in buying one or several Hemp scutching Machines or some other useful implement. I have sown hemp on a narrow slip of land in my garden which did very well. Within three years, I have repeated this experiment with seed bought by myself in Dublin in 1859. It has always perfectly well succeeded, whether it be cultivated for the fibre or for the seed.

Disease and divers circumstances, have prevented me, Gentlemen, doing more to carry out your views. Having spent \$39, there still remains a balance of \$61 to continue our experiment next year. This money is still in the hands of the Treasurer of the Board of Agriculture for Lower Canada.

The President submitted to the Board Mr. Courtenay's work on the Culture of the Vine and Emigration, and asks help in favour of this gentleman.

Resolved,—That the sum of \$200 be voted in favour of Mr. Courtenay, as an encouragement both for the culture of the vine and to help him in the publication of his book, entitled *The Culture of the Vine and Emigration*.

The Secretary read a petition from the inhabitants of the County of Lotbinière, asking for the formation of a 2d Agricultural Society.

Granted on condition that the Society be organized before the 1st of May next.

A petition from the Agricultural Society No. 2 of Verchères, stating their opposition to the formation of Agricultural Regions, and praying that the government grant be raised to \$1000, and divided in equal shares; that the secretary be not obliged to report to the Hon. Minister of Agriculture; and that the subscription to 20 copies of the "Revue" be not compulsory.

The secretary received instruction to answer to said Society.

A petition from Mr. A. Nadeau, of St. Isidore, County of Dorchester, praying for help or certain improvements on his farm. (Refused.)

Resolved,—That the subscription of the Agricultural Societies to 20 copies of the "Agriculturist," be conducted and governed in accordance with a resolution of this Board passed on 6th September 1861.

Resolved,—That the next Provincial Exhibition be held this year in Montreal, provided the Corporation of said city vote the sum of \$4000, in favour of said Exhibition; and that a Committee composed of Messrs. Sicotte, Campbell, and Taché, be named with power to take other members of the Board to prepare and organize every thing connected with the Exhibition.

The secretary read two petitions from Rimouski praying for aid in favour of the Industrial and Agricultural School of that place.

On motion of Mr. O. Taché, it was resolved,—That the sum of \$200 be voted as an encouragement to the Industrial and Agricultural School of Rimouski.

A petition from the Agricultural Society No. 2 of Verchères, asking permission to use part of its funds to give prizes for the best cultivated lands. (Permission granted.)

Agricultural Society No. 2 of the County of Charlevoix, asking permission to use its funds to purchase seeds and agricultural implements. (Granted.)

Agricultural Society of the Town of Sherbrooke, praying for the remittance of \$400, which it had promised in aid to the Provincial Exhibition held there last September. (Refused.)

The President informed the Board that he had received a telegram from the Clerk of the Corporation of the City of Montreal, informing him that a sum of \$4,000 had been voted by the Corporation in aid of next Provincial Exhibition to be held in Montreal next September.

M. J. N. Duquet prayed for help from the Board of Agriculture, for a publication under the title of *Elements of Agriculture for the use of Canadian Youth*.

Resolved,—That 500 copies of this pamphlet be purchased by the Board at ten pence each, to be distributed by the secretary, according to the instructions he may receive.

Mr. Ossaye gave to the Board information about the intention of the French government to give to the Board, a stallion (Percheron), a Norman coach horse, and a few merino sheep.

The President was requested to correspond on the matter with the French consul at Quebec.

On motion of Mr. Sicotte it was resolved,—That the sum of \$300 be appropriated to purchase and import improved machinery for the preparation of flax and for its conversion into tow and thread.

Resolved,—That \$1000 be appropriated for the purchase of flax and hemp seeds to be distributed under the control of the Board of Agriculture; two thirds of said sum to purchase flax seed from Riga, and the other third for Russian hemp.

Resolved,—That a Committee, composed of Messrs. Campbell and Archambault, be named to examine and audit the accounts of the Secretary, and report at the next meeting.

The Editor of the "Agriculturist" prayed for an aid from the Board to continue the publication of the "Agriculturist."

Resolved,—That a Committee, composed of Messrs. Sicotte and Taché be named to look into the affairs of the "Agriculturist," and that a sum not to exceed \$400 be voted for this purpose, in case the Committee should think it proper in the interest of this publication; and on such conditions as the Committee may determine.

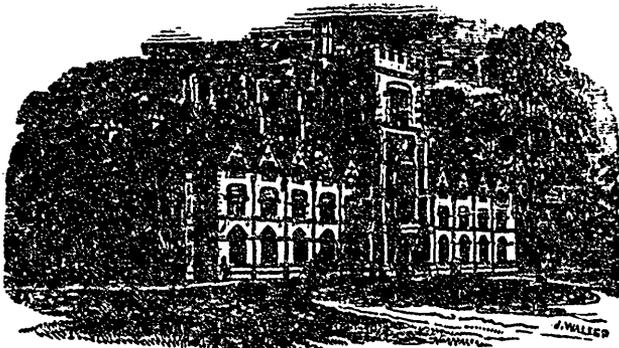
Resolved,—That the President be authorized to receive from the Agricultural Society of the County of Montmagny any cession of land and any moneys that this Society may be disposed to yield to the Board of Agriculture of Lower Canada, for the purpose of founding a model farm, and to pass any deed with that Society respecting such cession or gift.

The Board then adjourned.

(By order,)

GEORGE LECLERE, Secretary,
B.A.L.C.

EDITORIAL DEPARTMENT.



AGRICULTURAL COLLEGE OF THE STATE OF PENNSYLVANIA.

The Agricultural College of Pennsylvania has for its object, to associate a high degree of intelligence with the practice of Agriculture and the industrial arts, and to seek to make use of this intelligence in developing the agricultural and industrial resources of the country, and protecting its interests. It proposes to do this by several means.

1st. As a purely educational institution.

Its course of instruction is to include the entire range of the Natural Sciences: but will embrace most especially those that have a practical bearing upon the every day duties of life, in order to make the student familiar with the things immediately around him, and with the power of nature he employs, and with the material through the instrumentality of which, under the blessing of Providence, he lives and moves and has his being: and since agriculture, more than any other of the industrial arts, is important to man; and since for the complete elucidation of its principles more scientific knowledge is required than for all other industrial arts combined, it follows that this should receive by far the highest degree of attention. The course of instruction is thorough, so that it not only affords the student the facts of science, but it disciplines his mind to habits of thought, and enables him fully to comprehend the abstract principles involved in the practical operations of life. In doing this it is not deemed possible to educate every agriculturist, artisan, mechanic, and business man in the state, but to send out a few students educated in the college course, that they, by the influence of precept and example, may infuse new life and intelligence into the several communities they enter. A single individual who is thoroughly educated in the principles and the practice of an art, followed by a community, will often exert a more salutary influence upon the practice of this art, by the community, than would result from sending the whole community to a school of lower order than that which he attended. A single practical school of the highest order in Paris (the Ecole Polytechnique) during the last generation made France a nation celebrated alike for profound philosophers, great statesmen, able generals and military men, and civil en-

gineers. If one high school is established, subordinate schools affording the elementary education of the latter, will follow in due time.

2d. As a practical institution.

The Agricultural College of Pennsylvania has adopted the fundamental principle, that whatever is necessary for man to have done, it is honorable for man to do, and that the honor attaching to all labor, dependent upon the talent, the care, and the fidelity ex-

hibited in performing it. It is further considered essential as a part of a student's education that he be taught the practical application in the field and laboratory, of the principles he studies in the class-room; and manual labor is also necessary for the preservation of health, and the maintenance of habits of industry. An incidental, but not unimportant result of the operation of these principles is a reduction of the cost of tuition by the value of the labor, so that the college can take students at the present very low rates of admission.

All students without regard to pecuniary circumstances, are therefore obliged to perform manual labor as an essential part of the college education and discipline and training. In these respects consists a most essential difference between the idea associated with manual labor at this college, and that of all other attempts made heretofore to combine manual labor with study. Instead of the idea of poverty and want being associated with those who labor, that of laziness, worthlessness, and vagabondry, is associated with those who refuse to work efficiently; and the experience of the institution has already most assuredly shown that no young man, of whom there is any hope for future usefulness and efficiency in life at all, is insensible to the disgrace which thus attaches to lazy vagabonds who will work only as they are watched, and cheat their fellow students by refusing to do their share of the labor assigned them; and nothing is more conclusively settled than that those students who are the most studious and industrious in class, work the most efficiently and are the most trustworthy in the performance of their daily three hours' work.

3d. As an Experimental Institution.

The Agricultural College of Pennsylvania has an unbounded field for labor. The principles of Agricultural science, which shall ultimately constitute the subject of instruction in its class-rooms, are as yet only very imperfectly developed, and so great is the labor, expense, and time involved in making scientific agricultural experiments, that as yet little has been done in this direction. In this embarrassed condition of the finances of the college, it has not been possible to employ more scientific aid than was absolutely necessary to maintain a proper degree of efficiency

in the educational and practical departments, nor could the other expenses requisite for extended scientific investigation be met with the means heretofore at the disposal of the Board; a few experiments upon the manufacture, preservation, and use of manures for the growth of crops, have, however, been inaugurated, while corresponding initiatory steps have been taken to experiment in other departments. It is most earnestly to be hoped that the recent appropriation of public lands by Congress to the state for agricultural purposes will afford means for the development of this department of the institution. The development of no other department would yield richer and more lasting results, or would confer more substantial benefit upon agricultural practice than this. It must not, however, be supposed that these results will manifest themselves at once, or that they will pay as experiments are being made: as well might the farmer expect to reap his crop the day he sows his grain. They will, however, ultimately, pay a thousand fold, as have the practical application of the sciences of electricity, heat and optics, in the present day, paid for the half century of apparently unpractical, purely scientific investigations that led to the results now obtained through them.

4th. As a means of protecting the industrial interests.

Of the State, and most especially the agricultural interest, from the sale of bad or worthless or too high priced material (as manures, seeds, plants, and implements used in agricultural practice). The only efficient means of accomplishing this object is to diffuse a higher degree of intelligence, and a more extended scientific knowledge amongst farmers: for so long as they are unacquainted with the principles of agricultural science, there will be quacks and impostors, and ignorant empiricists, who will prevail on them to invest at least a little money in some new manure, seed, plants or other things, in the hope of realizing the large gain from it, that they are told will follow its use. Farmers have satisfactory means of testing agricultural implements, and they also can test seeds and plants with a good degree of satisfaction, but their methods of testing manures, chemical salts, guanoes, phosphates, poudrettes and other similar articles are very imperfect, and hence we find that the market is filled with worthless or very high priced manures, such as the farmer never would purchase, if he knew their composition and real value. A beginning has already been made towards making known the character of some of these manures; and although it is not expected that such work can be accomplished without opposition from parties interested in their sale, there is no doubt that before long all the bad manures will be driven from the market, and good ones, better and cheaper than the best and cheapest now sold, will take their place. In order to hasten this time farmers are requested and particularly urged to purchase no high priced artificial manures without having a legal guarantee with it, that it shall contain a specified amount of valuable matter, equal in value to what is paid for the manure.

Buildings.

The main college building is a stately and substantial edifice constructed of a silicious magnesian limestone of excellent quality for building purposes. It consists of a central part and two wings connected with the latter by outtains, the central parts and the wings facing on the same line, 234 feet long in front; and the central part resting on 54 feet of the front line, and extending back 130 feet; the two wings each resting on 42 feet of the front line, and extending back 81 feet. While the two curtains each occupy 48 feet on a line parallel to the front line, but ten feet back from it, the curtains extend back 56 feet. The building has five stories above a commodious basement. Each story has a large hall running from one end to the other, parallel with the front line, and extending through the middle of the curtains. From this hall, and at right angles with it, three halls extend back, one on the middle line of the central part, and one in each end wing; on each side of these halls, doors open into dormitories, recitation-rooms, museums, &c. The entire building embraces 165 dormitories, ten by eighteen square and nine to eleven feet high; a library room, twenty-four by forty-six; geological and mineralogical museum, twenty-four by forty-six; anatomical museum, twenty-six by thirty-six; museum of agricultural productions, twenty-four by twenty; chemical laboratory for beginners, in basement twenty-four by fifty-six; and two laboratories on the first story, each twenty by forty, for more advanced students; two lecture rooms, each twenty-six by thirty-four feet; four recitation rooms, each twenty by thirty-four feet; and several smaller rooms for apparatus for special scientific investigations, and for store rooms; also a large room eighty feet long and twenty-eight feet wide for a chapel, and two rooms, each fifty-six feet long and twenty wide, for society halls; and the entire back central part, forty-eight feet wide and eighty feet long, on first story, for kitchen and dining-room, and a room on the first story twenty by thirty-six feet, for an elementary or preparatory department, with an adjoining recitation-room, fifteen by twenty feet. The basement is mainly to be devoted to coal and hot-air furnaces, of which there will be sixteen of the largest size, from which heated air is conveyed in separate flues to every room in the building. All the rooms are also ventilated by flues extending to the top of the building from each room. The basement also contains the laboratory above noted, in addition to store-rooms, bake-house, and kitchen for culinary department, and three other laboratories for the rougher kinds of scientific work. The above, in addition to two reception parlors, and commodious apartments for one professor with family, and for the family of the culinary department, constitute the extent of internal arrangement of the buildings. For commodiousness, completeness of detail, and stability of construction these buildings are not equalled by the buildings of any Agricultural College in the world.

The other buildings embrace,—

1st. An excellent double decked barn, fifty-nine by seventy-five feet, and constructed upon the most approved plan, with wagon shed, corn crib, water cisterns, &c.

2d. A large hog pen, with a granary over it, twenty-two by eighty-three feet, including also a complete slaughter-house.

3d. A blacksmith shop, twenty by twenty-eight feet, with all the appliances for doing smith work.

4th. A carpenter shop and tool-house, sixteen by forty-four feet.

5th. Wash house. This building is sixteen by forty feet, situated near the barn, and is fitted up for washing the students' clothes.

6th. Two frame dwelling houses, one twenty-eight by twenty-eight feet, now occupied by the carpenter and Superintendent of the washing department, and the other, thirty-two by forty-four, occupied by the professor of botany. In connexion with the latter house is a small green-house, with choice native and foreign plants.

COURSE OF STUDIES.

The full course embraces four years, but students can enter any part of the course dependent upon their degree of advancement.

The first year.

The Student studies Arithmetic, Elementary Algebra, Horticulture, Elementary Anatomy and Physiology, Physical Geography and Elementary Astronomy, English Grammar and Composition, Elocution, History, Practical Agriculture and the details of management on the College Farm. Students, who have mastered the common school-branches, will be prepared to enter the classes of this year. In order to be fully prepared for it, they are advised to pay particular attention to Grammar, Geography, Reading, Writing, Spelling, and Arithmetic.

Second year.

Advanced Algebra and Geometry, General Chemistry, Vegetable Anatomy and Physiology, Zoology and Veterinary, Surgery, Geology, Paleontology, Practical Agriculture and Horticulture, Logic and Rhetoric. Students who are sufficiently far advanced in Algebra, Geometry and English Grammar, are admitted to this class, without respect to the other studies of the first year.

Third year.

Surveying, Navigation, Levelling, Drafting with the use of Instruments, Analytical Geometry, Trigonometry, Elementary Calculus, Natural Philosophy, Chemical Analysis, Veterinary Surgery, Entomology, Agricultural Botany, Practical Agriculture and Pomology, Political and Social Economy. Students who have mastered Davies' Legendre and Trigonometry, and who possess a corresponding degree of knowledge of the English Branches generally, and who have gone through a good academical text, book course of Natural Science, are admitted to this class.

Fourth year.

Analytical Geometry, Differential and Integral Calculus, Engineering, Drafting, Mechanical Drawing, Quantitative Chemical Analysis.

Veterinary Pharmacy, Gardening, Agricultural accounts and Farm Management, Moral and Intellectual Philosophy.

The ability to enter this year's course, is dependent so much on the Students having gone through the studies of the preceding year; and the latter being peculiar to an Agricultural College, of which there are no others in the country, no students prepared to enter it are likely to apply.

Students who successfully complete this course of studies, and pass a satisfactory examination, and prepare a dissertation of not less than fifteen pages of foolscap paper, upon some scientific or literary subject, (if scientific, it must embrace an original investigation) approved by the faculty, and whose general standing in the school shall have been good, shall upon the recommendation of the faculty, have the degree of Bachelor of Scientific and Practical Agriculture, *B. S. A.* conferred upon them by the Board of Trustees of the College.

Course for Graduates. Fifth year.

Students who after having taken the degree of *B. S. A.* shall devote three years to Practical Agriculture, or to any intellectual pursuit or profession, shall take the degree of Master of Scientific or Practical Agriculture, *M. S. A.*, or, if they remain another year in the Institution, and devote their time to special investigation, they can this degree at the termination of the year.

Private Laboratories with means for investigation, will be fitted up for graduates of this or any other college, in which to pursue prolonged, special, scientific investigation. Graduates of Literary Colleges, who may only have pursued an ordinary text book course in science, and who wish to devote some time more especially to science, in connexion with agricultural practice, can take any part of the above course, or devote themselves to scientific investigation with the graduates of the fifth year, at the same time they are familiarizing themselves with the details of agricultural practice on the farm.

Scientific Excursions.

The valley and neighboring mountains afford rare opportunities for botanical study; and for physical Geography, Paleontology and Geology. This district is unsurpassed by any other in the country. The great Synclinal and Anticlinal Palaeozoic waves east of the Alleghenias, are here shown in every variety of position and angle of inclination, while good outcrops of nearly all the subdivisions of the palaeozoic rocks from the lowest to the coal measure, are to be seen. Frequent excursions are made with classes to observe them.

AUXILIARIES TO STUDY.

Mathematics.

A transit instrument of first quality for field work, ordinary surveying apparatus, with compass, for the use of Students, and Mathematical figures and forms for illustrating Geometrical and Crystallographic principles.

Natural Philosophy.

Large Electrical Machine, Air-Pumps, Magnetic Machine, Galvanic Batteries, an extensive collection of apparatus for illustrating the

principles of Optics, Statics, Dynamics, Mechanics, Pneumatics, &c., and opportunities are offered for Students learning to use this apparatus themselves.

Chemistry.

A large collection of apparatus adapted to the lecture room and class recitations, for illustrating principles by experiments; also, a large Chemical Laboratory for beginners, and two other smaller Laboratories, each affording room for twenty-four more advanced Students, and several private Laboratories for special agricultural scientific investigation, all fitted up with the aids and appliances of the best German Laboratories, where the Students may pursue a thorough course of qualitative and quantitative Analysis. Also, collection of Marls, artificial Manures, Limestones, Ores, Minerals, &c., from different localities of America and Europe.

Botany.

Herbariums with extensive collections of American and European plants; microscopes; a botanical garden and green house with native and foreign plants; nursery for practice in budding, grafting, &c.; and anatomical preparations for illustrating vegetable structures. The neighboring flora, embracing, as it does, the wide range of the valley and mountain soil, affords excellent opportunities for botanical excursions.

Geology and Paleontology.

A collection of nearly six thousand specimens of rocks, limestones, fossils, ores, &c., collected from all parts of the State,—together with a large collection from Europe. The neighborhood is one of the finest in the world for the study of the numerous subdivisions of the Palæozoic rocks, from the "primal" to the "serial" of Rogers, in all of which the Student will have an opportunity of obtaining good specimens on geological excursions.

Mineralogy and Crystallography.

A good collection, embracing specimens of all the ordinary minerals known, and many rare specimens; also, collections of models, of crystals, blow-pipe apparatus for mineral testing, &c.

Practical Agriculture and Horticulture

A farm of four hundred acres limestone land of excellent natural quality, coming into a good state of cultivation; with all the tools, implements, and machines for efficient farm practice. Experiments with all the chemical elements of manures are carried out every session for the purpose of illustrating the effect of each element alone and in combination, as also experiments as to the time of planting and sowing seeds, and applying manures. Each Student will have an opportunity of learning all the varied operations of ordinary farm, garden and nursery work, in connexion with the management of farm stock. A small nursery is especially devoted to practice for Students. There are also extensive vineyard, orchards, &c.

Library

An extensive collection of choice literary and scientific works, with maps, diagrams, and charts, are accessible to the Student.

Reading Room.

A comfortable room, with all the leading scientific and literary papers and journals, is set apart for a reading room in the building.

Students' Societies.

There has been in the Institution from the time of its first organization, two Students' Societies, the "Oresson Literary" and the "Washington Agricultural" Societies. Each Society has a large and commodious room in which to hold its meetings, as also adjoining rooms for libraries, all fitted up in appropriate style by the members of the respective Societies.

CONDITIONS, AND FORM OF ADMISSION.

Qualifications.

Applicants must have attained the age of sixteen years, and present satisfactory certificates of good moral character and industrious habits; and must also have a good knowledge of the elementary branches of the common school course.

On entering, they must consider themselves pledged to conform to all the rules and regulations of the Institution, among which is the daily performance of three hours' manual labor.

Expenses.

The sum of one hundred dollars must be paid in advance, on entering. This, with the labor above specified, will meet all expenses for boarding, room rent, tuition and washing, for the term of ten months.

Applications.

These may be made, either by addressing the President of the Institution directly, or by applying through the Agricultural Society of the county, in which the applicant resides.

Certificates of Character.

These should be signed by the student's last teacher, the officers of the Agricultural Society of the county in which he resides, or by some other friend of moral and agricultural improvement.

It is the earnest desire of the officers of the College to fill it with industrious, trustworthy and gentlemanly Students, whose sense of honor and appreciation of duty will be a guarantee that they will conform to its rules and regulations.

It is their design to admit no other than such.

Expenses.

In addition to the one hundred dollars above specified, Students will incur only the following expenses:

Books and Stationery.

These will be supplied at city retail prices; and will cost about eight dollars per term for the third and fourth classes, and ten dollars per term for the first and second classes.

Apparatus.

The Students of the Second class will require about fifteen dollars' worth of apparatus, with which to study chemical analysis in the laboratory. This, when not damaged, will be taken back, if desired, at the close of the term, at a reduction of twenty-five per cent. on the first cost. With ordinary care, when the apparatus is returned, the cost of it per term will not exceed eight dollars.

Incidental expenses.

A slight incidental expense will be incurred for light, broom, towels, pitcher, wash basin, &c., in all not exceeding five dollars per annum.

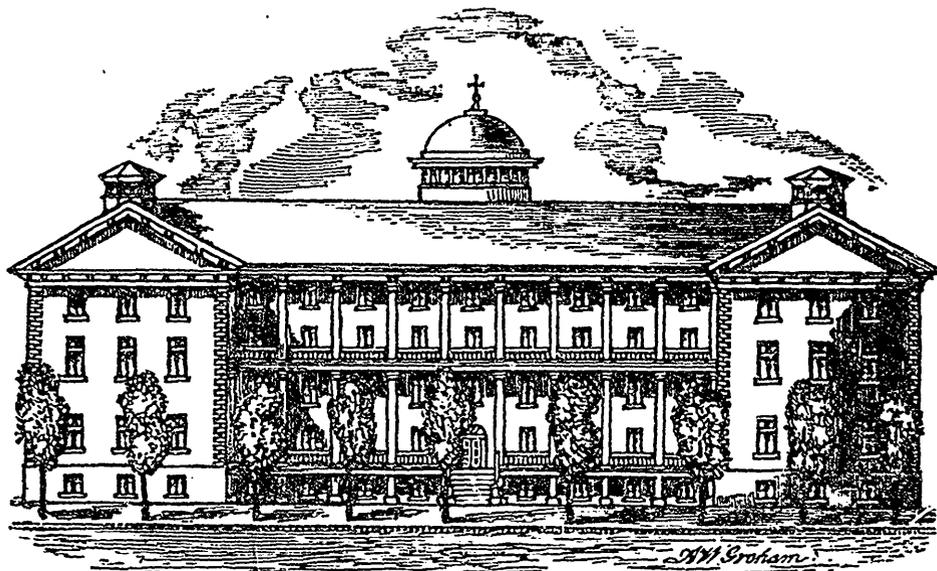
Economy.

As it desirable to impress upon Students the necessity of forming habits of economy, parents are advised not to be too liberal in giving them money; and they are recommended to deposit such sums as they may intend for their sons or wards in the hands of the Faculty, who will see that it is not spent improperly.

Clothes.

Each Student should come prepared with an additional suit of clothes, of common material, for wearing while working on the farm. As warm weather will commence soon after the beginning of the term, he should also make arrangements, previous to entering, for a supply of summer clothing.

Although not indispensable, some delicate Students have found an advantage in bringing with them a thick comfortable for their beds during a few cold days just after the opening of College, or near its close.



Engraving No. 1.—The Agricultural College of St. Therese—County of Terrebonne.

AGRICULTURAL COLLEGE OF ST. THERESE

The college is built on a five hundred acres farm, most of which is in a high state of cultivation. A large variety of soils from the stiff clay to the sandy loam offer to the student an application of the different systems of farming. Under drainage has been extensively applied to the draining of a large swamp now yielding the largest returns. Composting is one of the main operations of the farm and supplies a large quantity of valuable manure. More than twenty acres of land are annually put under green crops. An orchard garden and grounds afford all the necessary means of becoming thoroughly conversant with practical horticulture. More than 600 feet of farm buildings afford ample accommodation for any number of cattle. The fattening of beef and swine is carried on a large scale so as to provide for the annual consumption of the whole establishment, numbering 200 persons. Thirty milking cows will add new material for new and interesting experiments connected with the raising and feeding of stock. Engraving No. 2 is a plan of the farm buildings including the Court yard. The Pigsties **P**, as can be seen

are placed each side of a wide passage. **M** is a store room next to the Pigsties **R** shows the shedding where are the winter sleighs. **V** is a byre with interior distribution similar to that described further. **E** are the stables. The harness are closeted behind each pair of horses, so as to protect them against moisture. **CCC** are the barns. **RR** implement and vehicle sheds. **P** is the pump and the passage leading to the farm yard. **CH** is a grain store. **M** is a hay store in communication with the main byre **V** divided in two parts, the first occupied by the milk cows and the second by the fattening cattle. On the right are a number of pens for sucking calves.

Engraving No. 3, shows the interior arrangement of the byre. **A** is a wide passage for the distribution of food to the cattle. Hay and straw are thrown in the passage from the left through a trap. **XX** are the mangers. **PP** the floor. **RR** the drains. **SS** are another floor allowing easy circulation behind the cattle.

The building represented by Engraving No. 5 contains a room where the cooking of the food is done. **C**. a work shop **B**. a Butcher shop

D. a washing room I, and a dairy L.

The engravings, Nos. 3, 4, 5 show the front view of the buildings we have just described.

Improved implements have been in general use on the farm long since, such as, double mould board, horse hoes, straw cutters, root cutter, thrashing machines, &c. A work shop well provided with tools will enable every pupil to become acquainted with the most approved construction of agricultural implements and vehicles.

The Agricultural Course.

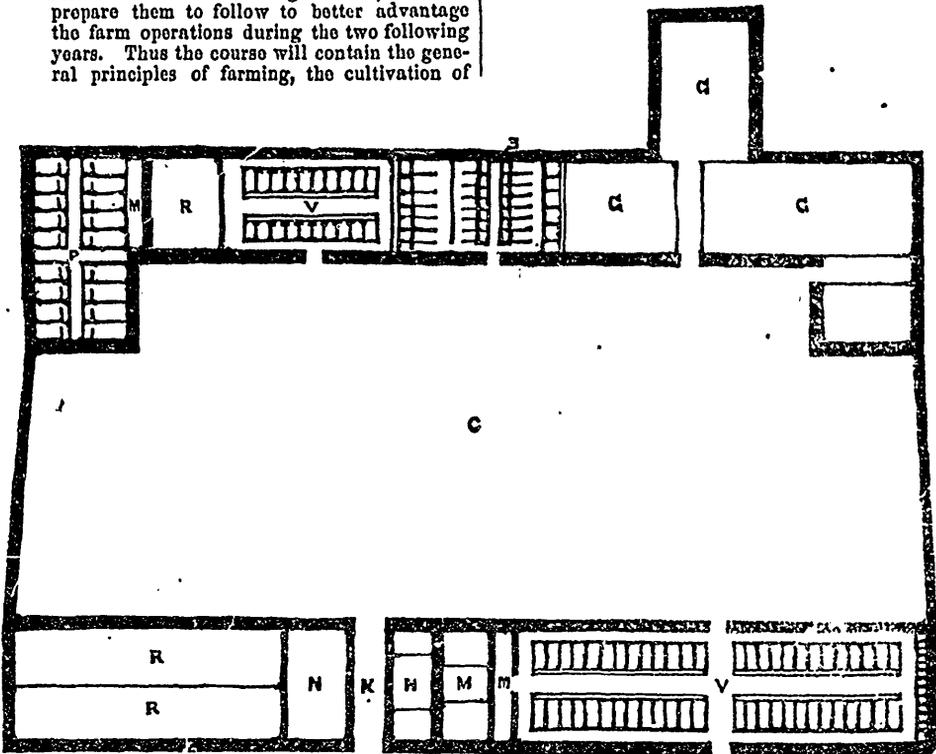
The full course will last three years and will be as follows. 1st year.—The course will give to the pupils an elementary knowledge of every science connected with agriculture, so as to prepare them to follow to better advantage the farm operations during the two following years. Thus the course will contain the general principles of farming, the cultivation of

plants, rotation of crops, horticulture, book-keeping, the general management of stock.

2nd year.—The course will consist of a more complete study of soils, manure, rotation, cultivation of plants, and horticulture.

3rd year.—Lastly the greater part of the studies will be directed on the management of Cattle, Anatomy and Physiology, veterinary, the improvement of breeds. Butter and cheese making will principally occupy the attention of the pupils.

The students will be allowed to follow the course of Chemistry and Natural History given to the pupils of the classical College.



No. 2.—General Plan of the Farm Buildings of the Agricultural College of St. Theresa.

So as to enable every farmer's son to benefit of the Agricultural college it is proposed to give a one year's course to those who could not afford the means of a larger time given to agricultural education. This course will be that of the first year. The pupils will have to work on the farm a certain number of hours without exception; they will also follow the professor every day in the fields and byres when practical operations will be going on. The students must be 15 years old at least and have an elementary education.

The college course will begin on the 12th March to finish on 31 December. Winter has been preferably used for holidays, as farm operations at that time are less pressing.

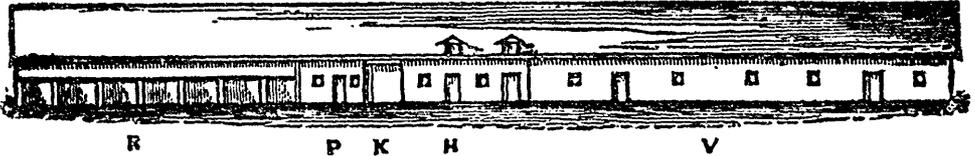
Conditions.

The price for board and tuition amounts to \$72 so as to facilitate the study of agriculture by a large number of pupils. They will be allowed to board out of the College. Tuition will then be charged \$24 only. Lodgings will be provided by the College for \$4 a year and the pupil will be allowed out side only for meals.

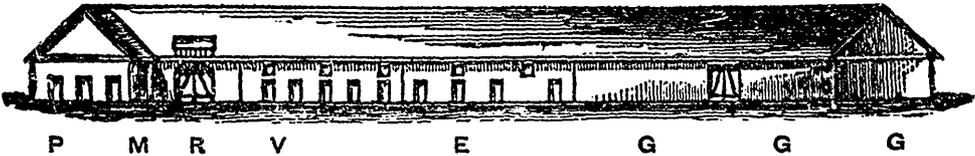
This plan of agricultural instruction meets with our entire approval. No doubt a large number of our farmer's sons in both sections of the province will avail themselves of the very great advantage offered them to acquire a full knowledge of theoretical and practical agricultural at an extraordinary low price. No

institution in the province is in the position of giving the same amount of education and comfort at so low a price. Besides there is the advantage for every English speaking pupil of learning French at the same time. The course of natural sciences, so important to the practical farmer, is here given in full, and will at once place the agricultural student on an equality with the professional men, with regard to general education. Latin and Greek are certainly useless to the farmer, and the agricul-

tural school of St. Thérèse does away with the necessity of studying them for several years before coming to that of the natural sciences, as it is done in every classical college of the country. Our farmers will no doubt understand this advantage and send their sons where nothing but what is useful, and every thing which is useful to the practical farmer, will be taught them during the course of studies. Already several English pupils have made application for admission.



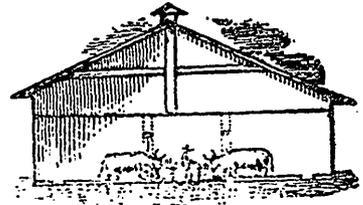
No. 3.—Elevation of the Shed—Byre and Store of the Agricultural College of St. Thérèse.



Elevation of the Piggsties, Byre-Stables and Barns of the Agricultural College of St. Thérèse.



No. 5.—View of the Shops.



No. 6.—Section of the Byres.

AGRICULTURAL AND VETERINARY INSTITUTION.

A class is about to be formed at Toronto for the encouragement among our young farmers of the study of Agriculture in its scientific and practical relations, and of the Veterinary art, in reference to the Anatomy, Physiology, Diseases and their modes of treatment of farm animals.

The latter will comprise the history of the races, and the principles of breeding, with appropriate illustrations. Mr. Smith is familiar with the most approved methods of treating in Europe, being himself a licentiate of the old Veterinary College of Edinburgh, where he attained a high standing, and will study to adapt his instruc-

tions to the capacity and special wants of his students, who will have additional opportunities of facilitating their studies by engaging in dissecting and the use of instruments.

In the department of Agriculture, Professor Buckland will receive valuable assistance from several of his colleagues in University College, in Chemistry, Geology, Botany, Entomology, and other branches of Natural History; all of which have important bearings both on the theory and practice of Agriculture. The composition of soils, plants and animals, will be as fully treated of as the time will admit, with descriptions of the most approved implements and machines, and the principles on which they

act. Manures, their composition and modes of action; rotation of crops, and a description of the various products of the farm, and their comparative value; the alteration and construction of farm buildings, the laying-out of fields, fences, road-making, fruit and ornamental planting,—will also receive attention.

The chief design of these lectures is to point out to young men actually engaged in farming, who have not had the means or opportunity of making themselves acquainted with the scientific principles on which the agricultural art is based, *the cheapest and readiest way of acquiring this knowledge.* With this great end in view the pupils will be fully instructed how to read and study the best treatises on the various subjects that will come under their consideration, and to form a correct habit of observing, recording, and applying the agricultural phenomena of daily life. As the successful prosecution of agriculture, as a business, greatly depends on a correct and vigilant habit of every day observation, the opening of the eye and the exercise of the reason and judgment on the changes that occur in nature, and in the markets of commerce,—great pains will be taken to develop these qualities in the class, and to *prepare young men to think, study, and observe for themselves.* It being intended to form a class of this character every winter, its studies will as far as possible be made complete in one term; but in case of students presenting themselves a second time, facilities will be afforded for carrying out their studies and investigations to a wider extent.

In the Veterinary department the instruction will proceed from rudimentary principles to their application in practice; and the main object aimed at, is to enable young men to acquire a correct general knowledge of the structure and physiology of the domesticated animals, and of the most approved methods of treating ordinary diseases; an acquisition in itself of no mean practical value. The pecuniary loss to farmers, every year, from a want of this kind, and degree of knowledge and skill, is much greater than is generally imagined. Mr. Smith is ready, we believe, to receive *professional* pupils,—such as intend to follow the Veterinary art as a means of livelihood: and one of the chief objects of the Board of Agriculture in originating this movement is the hope of establishing ultimately, in this section of the Province, a regularly organized Veterinary School, in which the various branches will be thoroughly and *professionally* taught by a complete staff of Professors. This, however, must be a work of time. As the live stock of the country has been of late rapidly increasing, both in amount and quality, and consequently in money value, the proper understanding and treatment of disease is daily becoming a matter of greater moment. Hence the necessity of making a commencement in this direction.

As the introduction to the class, to which we have now drawn attention, will be gratuitous, and no further expense to pupils need be incurred beyond that for board for a week at the most leisure period of the year, it is hoped that a goodly number of young men, desirous of self-improvement, from different sections of the Province, will present themselves on the approach-

ing occasion. Let none keep back from a supposed deficiency in preliminary qualifications; an ordinary English education is all that is really required. The principal *requisite* is a *desire to learn.* No kind of examination will be required either on entering or leaving the class.

But to such as may be disposed to pass an examination in all the subjects at the end of the term, prizes in books will be awarded in accordance with the proficiency attained. We like the idea of these prizes much; they will tend to stimulate study and a healthful rivalry among the pupils; and those who are successful will take with them into the country some of the best books relating to their pursuits, that will for a long time to come benefit both themselves and neighbors. Such young men will in time become rural missionaries in their respective localities, and diffuse around them a desire for knowledge and agricultural improvement.

THE SUBJECT OF LANDED CREDIT.

A very remarkable pamphlet has just been published on this important question by Mr. George Henry Macaulay of Quebec. The discussion of the subject is conclusive and numerous quotations from the best writers on political economy afford ample proof of the desirability of such a scheme, as the only means of improving the present state of things. Our farming interests require capital; and it is only fair that the farmers should have the same facilities to procure it as the more favoured manufactures and commercial men. An agricultural loan to be any thing like useful must be made at a low rate and redeemable only at a distant date. Farmers are well aware that agricultural improvements will not give large immediate returns, especially on worn out lands; they know that crops will not, the next year yield abundantly even if manure has been extensively applied to the land. In clay soils, especially, several years will elapse before all the fertilising constituents of a manure will have been converted in to crops. And even then a large amount of fertility will be imparted to the soil, which for several years will give some return. Hence the necessity for the farmer to borrow for a long period which will allow him to reimburse the capital intrusted to the land, just as fast and no more as the land itself will return it.

Again, for stock: who will deny that the price paid out in the importation of improved animals, is invested for several years before a cent can be obtained from their offsprings. No doubt when used as crosses the utmost is at once realized; but if thorough bred stock is raised, before the farmer is in a position to sell out a few heads, a very long period of valuable time will elapse, during which uneasiness will be felt, if the capital engaged in the improvement must be promptly reimbursed.

Again with regard to permanent improvements such as Draining, farm buildings, composting no immediate return can be expected to such an amount as to repay in a few months the total expense. Improved implements and labour saving machines are certainly most useful and most profitable when properly employed, still these implements to be procured

require a large outly, which the farmer cannot make if money is not to be procured on easy terms.

Thus the proposed Territorial bank is calculated to bring about general improvement through the land; and we can only wish that the scheme after standing on its own merits will be made to work for the general welfare of the country. Mr. Macaulay's pamphlet gives a very good view of the subject; and we extract from his very remarkable work the two following chapters, which throw considerable light on the question.

The Advisability of Establishing a "Banque de Crédit Foncier" upon a solid basis.

Any calm observer, who has resided for a length of time in the country Parishes of Lower Canada, must have perceived the peculiar position occupied by the "habitants," or peasants of that section of the Province. It cannot be denied that they are healthy, active, and industrious; that they use every effort to improve the properties which have been inherited by them from their ancestors; but there are evidently some causes which produce effects contrary to those which we might expect from a class which enjoy so many natural advantages. The soil is, on an average, good, but the climate is not so favourable to agriculture as that of the upper section of the Province; the habitant farmer is naturally intelligent and active; he gains his daily bread by the sweat of his brow, and laborious exertion has no fears for him; but there is a restraining power, a something which interferes with ultimate success, and hampers the full and untrammelled exercise of his energy. He is continually accused of being deficient in spirit of enterprise; he is taunted with following too closely in the footsteps of his predecessors; he is frequently included in a comparison with the superior race of farmers in Upper Canada, the comparison resulting of course unfavourably to him, and in fact, he is the butt of every publication, whether agricultural, educational, or commercial. The sincere political leaders of the French Canadian "habitants" have long been aware of the existence of those unfortunate causes, which have restrained their constituents in their onward progress, and they now intend dealing with the germ of the disease, by the application of what they consider to be a reliable remedy, viz: the establishment of *La Banque de Crédit Foncier*. We maintain that the main causes of the want of progress among this class, have been, the weight of debt which burdens almost every farmer's property in the county parishes of Lower Canada, and the want of available means to place the repayment of that debt on such a footing that it may be easily accomplished. In addition to these, but of course as relative consequences, we find a universal system of ruinous usury, to which the overburdened farmer is compelled to resort, to save his family from expropriation; the real cause being the want of some system through which the undoubted security he can offer, might enable him to obtain credit at a moderate rate of interest.

Mons. Wolowsky, in a treatise on this sub-

ject, published in 1852, thus describes the principal object of a "Crédit Foncier Bank" in France.—:

"Public opinion has been actively occupied during the past few years with the question of the "Crédit Foncier." The published principles of this scheme are: to place landed property and capital in immediate and favourable contact with each other; to remove the obstacles which prevent the establishment of confidence when the security is really of the most reliable kind; to facilitate the debtor's discharge, and to place at the continual disposal of the creditor, the funds which he may have advanced. We think that the principle would long since have been adopted in France, had it not been complicated by the suggestion of chimerical plans and false notions with regard to the nature and operations of the proposed issues."

In 1853, Mons. Heurtier, French Minister of Commerce and Agriculture, thus addresses Mons. J. B. Josseau, author of a work on the "Crédit Foncier":—

"The Credit Foncier Institution is still in its infancy in France; but when its principles are understood, and it is wisely organised, the public curiosity, which its existence now creates, will be followed by a general feeling of deep gratitude to the Government, which has succeeded, by the means of this Institution, in relieving landed property from the terrible slavery of debts payable at short date, with the usual consequences of expensive renewals and costly proceedings, generally followed by ruinous expropriation. It is by this successful change in the conditions of loans on real estate, and the amendment of our mortgage system (*système hypothécaire*), that landed proprietors, who have latterly been reduced to the last gasp, find a chance of recovering their lost position."

We may well ask if the above extract is not a correct picture of the position of thousands of our country farmers in Lower Canada. In the seignories, they are oppressed with a heavy balance of arrears due to the Seigneur, through the abolition of the Seigniorial tenure; and each farm has been divided and subdivided until it has ceased to produce sufficient for the maintenance of the numerous scions of the family who have to depend upon it alone for a live lihood. The sons emigrate to a new township, without money, frequently without the materials and food which they actually require to enable them to exist during their preliminary clearing operations. If they borrow money from a capitalist to enable them to purchase what they require, he, of course, exacts a mortgage on the parent's property at a rate of interest as high as 15, 20, and sometimes 25 per cent per annum. The consequence is inevitable, the young farmer is hampered in his enterprise, while the parent is harassed by the exacting capitalist. In many cases the ruin of both father and son is the result of this attempt at progress. This is but one of the many processes through which the lower Canadian farmer is denied fair treatment. Merchants, who settle in the country villages, are

generally the bitterest enemies of the habitant. They have the advantage of a credit in the cities, they are not fettered by the difficulties which surround the farmer; and though they have but little security to offer to the city merchant, still they enjoy a good credit, and make use of it to oppress then men who can offer more real security than they can, and who consequently better deserve to have the benefit of credit in some available form. Your country notary, too, is frequently a bird of prey. He picks up game for the city cormorant who is too indolent to search for it himself. As this notary thoroughly understands the title deeds and means of every farmer in the parish, he is in an excellent position to become acquainted with the pressing wants of Jean Baptiste, or Jean Pierre. He can, he thinks, succeed in obtaining him the money he requires, but as a great favor, at about 15 or 20 per cent. on a first mortgage, payable in a few years. Jean is in a corner; he must make a certain payment on his property, or he must send his son to the new settlements, and he requires supplies which cost money. The notary passes the deeds; and Jean, having received the net proceeds, has a millstone round his neck which will most probably drown him in a shorter time than some of our English Newspapers give to the borrower from the *Crédit Foncier* Bank. Having thus briefly described some of the evils of the present unorganized system of loan on mortgage, let us proceed to ascertain the nature of the basis upon which it is proposed to establish this *Banque de Crédit Foncier*. By referring to the petition of the St. Hyacinthe Convention, it will be found that it is proposed to establish a Bank, with a subscribed capital of one million of dollars, in ten thousand shares of one hundred dollars each. The Provincial guarantee is asked for, to enable the Bank to negotiate its bonds in England. The security offered in lieu of this guarantee is in the shape of *first mortgages (bailleur de fonds)* on the properties of the borrowers, guarded by the important condition that the Bank cannot loan in excess of one half the estimated value of the property mortgaged. We shall not now enter into the details of the working of the system, as such will come under its proper heading; but at the outset we claim that the security offered by the promoters of the scheme is sufficiently sound to warrant us in asserting that it is proposed to form a Bank upon a solid basis. The wants of the rural population are of such a pressing nature, they are suffering so severely under the difficulties which we have before described, that the establishment of some public institution, formed upon a solid basis, which would procure for the "habitants" the advantages of a moderate credit on easy terms of repayment, should at least deserve the attention of all those who take an interest in the progress of the country. We cannot do better than to conclude this chapter with the pithy description, given by Mr. Wolowsky, of the *Crédit Foncier* Institution in Poland and Germany: "The *Crédit Foncier* Institutions which exist in Poland and Germany, by "means of a simple but ingenious combination, "permit a compromise between the require-

"ments of proprietors and the exigencies of
"capital, by marking the security with a
"stamp of solidity, by assuring the regular
"payment of interest, and by providing for
"the ultimate extinction of the debt incurred.
"by the borrower, through the establishment
"of annuities which form a sinking fund
(*fonds d'amortissement*)."

The practicability of the scheme as applied to Lower Canada, and the principle upon which it should be applied.

We feel that it would be imprudent to approach this important branch of our subject without extreme caution. So much has been written through the press, in favor and against *Crédit Foncier* Institutions, that we are compelled, in deference to the contradictory opinions which have been expressed on both sides, to refrain from offering any very positive opinion with regard to the principle upon which it should be introduced into Canada. The opinions of the leading political economists of Europe, which we have quoted in former chapters, and the details of the working of the Landed Credit System in France, as late as 1862, abundantly prove that the institution of *Crédit Foncier* might be advantageously put into operation in this Province. It is very evident that the Provincial guarantee asked for by the St. Hyacinthe Committee, has been the main cause of the opposition which has been manifested, and the objections which have been raised to its introduction into Canada. Twenty millions of dollars is no trifling sum to add to the Provincial liability, and a demand for an equivalent of twenty millions for some purpose, in the Upper Section of the Province, would inevitably be made the principal condition of a grant to the Lower section.

Although we do not share the fears expressed by the opponents of the scheme with regard to the risk which would be incurred by the Province, in giving such a guarantee, still, we fancy that the St. Hyacinthe Convention have aimed too high at the outset of the enterprise.

It might, perhaps, have been more in accordance with the rules of political economy, to have commenced with a smaller demand. There is a wide-spread feeling of alarm throughout the country at the prospect of the guarantee of twenty millions of dollars, and in the present state of the Provincial finances, it might be prudent to moderate the demand. Above all, the movement, whatever phase it may assume, should be joined in by all political men, regardless of the lines which divide political parties.

It should be viewed as a question purely of political economy; it should be treated on its merits, without prejudice and with neither fear nor favor. Members of Parliament will, we are convinced, give the subject an impartial and unbiassed consideration. By such a proceeding they will aid in throwing new light upon the working of the system of Landed Credit, and they will not fail to discover whether it be applicable to the position of Lower Canada, and how it should be applied.

The question of introducing a system of Landed Credit into Canada, was first seriously broached in 1852. A. E. Kierzkowsky, Esq.,

of St. Charles, then one of the directors of the Lower Canada Agricultural Society, now member for the county of Verchères, published a pamphlet with the title, 'The Question of the Seigniorial tenure of Lower Canada, reduced to a question of landed Credit.'

In the preface of this interesting 'brochure' we find the following opinion :

"The cause of agricultural progress is impeded by an obstacle which, so long as it is not removed, will render the efforts of Agricultural Societies, for the most part, fruitless.

"The absence of capital, of which farmers might dispose, is the obstacle to which I allude. The rotation of crops, the use of manure, drainage, artificial meadows, &c., &c., although undoubtedly great improvements and excellent things in themselves, will always be for the majority of Canadian farmers theories of a difficult application so long as the pecuniary means are wanting for the outlay which such improvements render necessary."

The plan of the writer at that time was to abolish the Seigniorial Tenure through the establishment of a Landed Credit Institution, and he expressed his firm opinion that "Agriculture would receive vigorous impulses from the establishment of such Institutions which the Seigniorial Tenure question is alone sufficiently powerful to create in this country."

Mr. Kierzkowski's proposition was to form a compact society composed of the censitaires, and to convert the debt due to the Seigneurs into an amount borrowed from the Landed Credit Society, payable through a Sinking Fund, at long date. He further remarks that, "the plan of which we give the principal features, is the faithful application of the principles followed in several parts of Germany and in Poland, modified and ameliorated to suit the political and social constitution of Canada, and we are satisfied that such a system would be in many respects more advantageous to Canada, than it has been to the above mentioned countries." Further on he says :—"The system has been recently introduced into Belgium and France, and it will depend entirely on the manner in which it will be received in Canada, to give life and motion to public or private credit, or prove its death blow." And :—"The Institution of Landed Credit established at first with view of the commutation of the Seigniorial dues, might at the same time serve to provide Farmers in Lower Canada with the capital which is necessary to them in order to improve the present condition of their lands which are exhausted by a long and improvident cultivation."

If these words were true in 1852, they are of equal importance in 1863. The lands of Lower Canada are certainly not improving. The want of available capital is sadly felt throughout the country villages, and a Landed Credit Institution would be hailed with satisfaction by the whole rural population. Its establishment, though on a small scale at the outset, would sound the death-knell of usury and extortion.

The establishment of a Bank, with a capital subscribed by Shareholders to the amount of even \$400,000, would be a favourable commencement of operations. We apprehend that no objection would be then offered to the Government guarantee for a similar amount. As the Society would conduct its operations with the strictest precaution, it is highly probable that no dangerous loans would be made. The limited capital at the disposal of the Bank would naturally lead to limited and safe operations which would increase from time to time, as circumstances might justify.

The discussion in Parliament will more amply develop the details of the introduction of the system into Canada. That it is practicable and highly desirable, no one, we venture to assert, will for one moment question.

We therefore trust that the establishment of a Banque de Crédit Foncier will receive that attention which its importance deserves.

In conclusion, we have to ask the indulgence of the reader for the many imperfections which this little work contains.

If it can serve, however, to impart some useful information on the subject of Landed Credit, its object will have been amply attained.

THE LOWER CANADA AGRICULTURIST AND THE PROVINCIAL AGRICULTURAL DEPOT.

Our readers will remember that since the first number of the present volume has been published, we have doubled the matter of our monthly edition, and doubled equally our issue, at considerable expense to ourselves. We were under the impression that by thus doubling our circulation, we would be granted a larger amount for advertisements, especially after giving such an increase of reading matter. But the Board of Agriculture not entertaining favourably our proposition, we are compelled to return to our first conditions, which are that the "Lower Canada Agriculturist" shall contain yearly, twelve numbers of 24 pages of reading matter, and no more. To this date we have issued, during the seven first months, 234 pages, thus leaving 54 pages for the next five months; The difficulty which we have experienced in collecting subscriptions, will force us to thus limit our issue, if our agricultural societies and subscribers cannot afford to pay at once their arrears. The Provincial Agricultural Depot has been removed to the Jacques Cartier Normal School, Notre Dame Street, where our collections will be constantly on exhibition, and every information readily given.

YELLOW INK.

Take 3 ounces of alum and 25 ounces of yellow French berries, and boil them together for one hour in 3 quarts of water, then strain and add 1 ounce of gum arabic. Saffron boiled in water, with a little alum also makes yellow ink; and gamboge dissolved in water is sometimes also used. A solution of the bichromate of potash makes a yellow ink for writing upon paper that has been prepared with a solution either of the acetate or the nitrate of lead.

FARM OPERATIONS.

MAPLE SUGAR MAKING.



GREAT requisite in sugar-making is to have all the vessels perfectly clean. Strict cleanliness should be observed during the whole process. Tin vessels are better than wood for this reason. Properly washed, they can never impart sourness to the sap. If made large enough to hold nine quarts each, they would cost about \$35 per 100, and six quart-pails cost \$30 per 100. They may be made square or round, but the latter are better to clean and to keep their shape. They should be large at top, so as to pack away in nests when not in use. The top should be strongly wired, like a tin pan, and a hole made under the wire enables it to hang on a nail driven into a tree, securing it thus from swine and other animals, and preventing the sap from being blown away by the wind. Old horse-shoe nails straightened and sharpened are the best.

The best spouts are made of thick tinned iron. When the vessels are hung as above described on nails, the spouts need not be more than three inches long. They should be widest where they enter the tree. After the sheet tin is cut up to the proper size, the concave shape is given to them by placing them between a convex and a concave piece of wood and giving them a brisk blow with a mallet. Ground sharp at the wide end, they are easily driven into a tree.

Never allow the sap to stand in pails twenty-four hours.—the fresher it is when boiled the purer will be the sugar. While boiling, large quantities should not be poured in at a time, as that will stop it, and make irregular work; but a reservoir should be placed above the boiler, from which the sap may be drawn in a stream through a faucet, just fast enough to supply the evaporation. A little practice will enable the operator to judge how large this stream should be. Two boilers are better than one if the fire is made to pass from under one to the other—the first or hottest being chiefly for boiling down to syrup, and the second or coldest for heating the sap and doing the first evaporating. The faucet of fresh sap runs into the first, and a pipe or syphon, with faucet, conveys it to the second. Cook's patent sugar evaporating is very valuable for boiling the juice of sorghum, as it reduces the juice to molasses in less than half an hour by a continued process, and would be very useful

for maple sugar, but less indispensable. It is on a principle similar to that of the two boilers above described, but more complete and perfect; the sap enters one end and flows from one side to the other many times by means of intercepting partitions, till it reaches the other end, by which time it is reduced to syrup, the proper current being given by raising or depressing the end, as the case may require.

Kettles are poor boilers—they waste fuel and make poor sugar. Shallow sheet-iron pans are much better. They may be kept cleaner, they evaporate more rapidly, make finer sugar, and effect a great saving of heat. In all cases, the boilers should be so set that a thin sheet of flame may pass under them. For example,—a sheet of flame, two inches thick under a boiler, is as good as if a foot thick—the same amount may therefore be spread over six times the surface, and consequently be about six times more economical.

We have seen good home-made pans, used for boiling sorghum successfully, made by nailing good thick sheet-iron to plank, so that the sheet-iron formed the bottom and ends, and the plank the sides—the sheet-iron was secured to the plank by two rows of closely driven nails.

The pans were about 8 feet long, and 4 wide, and 6 inches deep. These would be cheap and very good for making maple sugar. The fireplace should of course be a little narrower than these pans. The chimney should be high enough to cause a good draught.

To make good syrup, the sap must be reduced to one-twentieth or one thirtieth of its bulk, or be boiled twice as much as sorghum juice. The syrup is then to be strained through flannel, and placed aside to cool and settle 12 to 24 hours. Then return it to the pan, and to every gallon add and stir a beaten egg and a gill of milk to clarify it; keeping it carefully from boiling till the scum has risen and has been skimmed off. Then boil it carefully until it will harden, which may be known by dropping some from a spoon into cold water. When this takes place, the liquid sugar may be then poured into proper vessels, and then the cakes placed in a box to drain. To make the sugar perfectly white, lay a few thicknesses of flannel on the top of the cakes while it is draining; these flannels to be wet and washed daily with cold water—they will thus absorb and wash out the coloring matter.

A hundred good sugar maple trees will usually make in a season from two or three hundred pounds of sugar, if well managed; and if every precaution is observed to ensure cleanliness, prevent souring, boil speedily and without burning, and to clarify properly, a larger quantity of sugar will be made, it will be more saleable and command a higher price; or if intended for home use, the smiles of the farmer's kind wife, when she sees such a beautiful article make its appearance, will more than repay him for all the pains he has taken to secure such excellent success.

CALENDAR OF OPERATIONS FOR APRIL.

A glance over a table like the following will generally call to mind some piece of work that would otherwise be forgotten or neglected.

FARM.

Sunshine and the south wind struggle with the frosts and gales of Winter, and Spring asserts this month her right to rule. The thousand trickling rills, starting under the snow banks and gathering fresh strength and many drops from every softening sod, make hill-side and meadow musical with their liquid voices, giving man notice that winter and frost have quit their hold upon the soil, and calling him to his labours. On warm well drained land work cannot commence too soon after the frost and water are fairly out of the soil; but heavy soil is often injured by working while it is wet.

Buildings.

Make provision for the increase of the herd and flock, and attend to inside repairs, painting, etc. Delay outside painting until next month. Heavy rains accompanied by wind will injure a coat of fresh paint.

Cattle.

Some succulent food is very important to the health of all kinds of stock. Feed a few roots, mangels or rutabagas daily. Separate cows near calving from the others, giving them wide roomy stalls or boxes. Keep watch to render assistance if necessary. Working oxen must be well fed and not allowed to overwork at first.

Cellars.

Clean out decayed vegetables, superfluous sand, or lumber. Whitewash with a simple lime wash, to make them lighter, sweeter, and more healthy. Keep barrels, tubs, etc., where they will not dry or decay.

Clover

May be sowed at any time during the month—best when the ground is frost-cracked on a still morning, or else upon new fallen snow, as the seed may then be seen and it can be more easily sowed.

Drains.

Should be examined, as soon as the frost is out of the ground, to see that there are no obstructions. Wet spots in drained land indicate stoppages in drains, which can seldom be repaired before the season is dryer. A perfect system of surface drains is essential, at least where underdrains are not laid, and it is more important to have them clear now than at any other season. If possible get in some new drains where needed; it will make the land 3 to 6 weeks earlier.

Farm Accounts.

No work done on the farm pays better than that done in plaining and laying out the farm for the future, and in keeping full accounts.

Fences.

Re-set posts and walls heaved by the frost; and mend fences before your neighbours turn out their cattle; but do not think of turning your own stock out to grass for two months yet. Happy is he who has a good fence, but happier he who can do away with one.

Grain.

Examine that stored in bins. Keep from dampness, mold, insects, and rats and mice.

Grass Lands.

Pull out bushes and briars by the roots, remove stones, and roll heaved land as soon as the ground will bear the teams. Top dress before

rolling with ashes, Chili saltpetre or guano, where desirable.

Hired Men.

Lose no time in hiring good men for the summer's work; the opinion prevails that labour will be scarce and wages high, but we doubt it. Don't have a shiftless, lazy, or unprincipled man on the farm at any price. Where several hands are employed, give each his own work; every team its own driver; and let the most skilful be employed in his appropriate department.

Horses.

Groom thoroughly; feed carrots (4 qts. a day) to make them shed their coats well and get them in good condition for spring work. Be particularly careful to guard against colds taken by exposure, when unblanketed, and against galls and sores.

Ice-Houses

should be closed up, the Ice well covered with straw, ventilation provided in the top of the house. As poor ice is better than none it may not be too late to secure some, if still needed to fill up.

Manure.

Manure-making may now progress rapidly. The compost heaps will need working over, manure for the field carted out, and all kinds of litter and scrapings of yards, ditches, sinks, hen-houses etc., may be composted with muck or earth. Barn-yard leachings, urine and castor pomace quicken inert compost heaps.

Pasture lands may receive the same treatment as grass lands, in kind if not in degree; and on old pastures benedust, superphosphate, or leached or unleached ashes may be applied with good effect.

Plowing is work never to be done in a hurry or on heavy land when the water is not out of it; and never to be slighted. Manure should never be buried deep at this season, unless the land is to be plowed and manured a second time. Deepening the soil by plowing is best effected in the autumn, but may be done in the spring in connection with subsequent surface manuring.

Potatoes.

Early planting is advisable, and the last of the month is not too early for some localities. It is much pleasanter to sell potatoes for \$1.50 per bushel than 50 cents or less.

Poultry.

Give free range in the orchards and fields; feeding grain with corn and cabbages. They will then not eat buds, but find multitudes of insects. Set hens in places where they may be conveniently taken care of, and out of the reach of rats.

Seeds.

Secure a supply early, and test samples in pots or boxes of earth before sowing or purchasing largely.

Sheep.

A successful shepherd is ever watchful, tender, and careful.

Swine.

Keep a little charcoal and ashes in the corner of the sty; and a handful of flour of sulphur in the swill is a good thing at this season; feed raw roots to breeding sows, but not in quantities enough to produce scouring; and give besides a nutritious diet.

Tools, etc.

We scarcely need repeat the injunction, to look well to tools, harness and wheel vehicles of all kinds, and have every-thing ready for use.

ORCHARD AND NURSERY.

Begin work as soon as the ground is open; protecting trees from freezing after they are removed from the ground. Whoever sets out trees should not bring his trees from the nursery before his ground is ready to receive them, and nursery-men always favour their own interest when they aid their customers, even if it seems to be to their immediate disadvantage. Remove crippled or decayed trees in young orchards. On every farm new places can be found for choice fruit trees. A few dollars in trees will be a paying investment in a brief time.

Apple Trees.

Scrape off all moss and bark lice, and wash with lye. Leave pruning of large limbs until summer, but take off suckers and dead wood. Replace poor sorts by grafting with choice varieties. Graft young stocks near the roots; which may be done in the house.

Cions.

Cut early in the month, if not already done. Keep covered in sand until wanted for use.

Draining greatly improves land for fruit growing, and in the nursery this is oftenthe only time to drain conveniently. Use rather large tile.

Evergreen Trees.

Leave transplanting until May, except perhaps Norway Spruce and Arbor Vitæ, which can be removed with balls of earth adhering.

Grafting.

Begin with stone fruits before the buds swell but after the sap starts; cut grafts and insert as soon as possible. Leave apples and pears until next month.

Insects.

The parent of the canker worm ascends the trunks of trees during warm days this month. Many may be destroyed by surrounding the trunks with paper covered with tar mixed with oil enough to keep it soft, and often renewed. Remove scale from the trunks and main limbs; and look for caterpillar eggs near the ends of twigs.

Manure.

Apply lime or ashes worked in, in a circle around the trunk as far as the shade falls at mid-day; also top-dress the soil with compost or dung.

Pear-Trees.

Let there be plenty of choice standards which are so valuable for both fruit and shade around the dwelling. A few dwarfs may occupy a place in the garden. Procure seedling stocks early,

Pruning.

Pear and other fruit trees, except apples, may be pruned this month. Prune apple trees with the *knife only*; prune grape vines now, or wait till May.

Stone Fruits.

Cherries, Peaches, Plums, etc. Let the homestead be well supplied; good fruit makes any place attractive and adds value.

Seeds of fruit or forest trees kept over win-

ter should be planted as soon as the ground is mellow and warm. Sow evergreen seeds and those of mountain ash on the north side of an open fence or otherwise in half shade.

Transplanting.

Preserve the roots uninjured as much as possible; pare smoothly the ends of those broken. Re-set them as soon as may be after taking up; straighten out the small roots; set at the depth of natural growth in good mold, above soil enriched with compost of leaves or muck, ashes, and a small part stable manure.

KITCHEN AND FRUIT GARDEN.

Nothing can be done in the open ground until the soil is dry and mellow. Then get out fine manure and spread and spade it in with a spading fork. Now-a-days nobody should use a spade except for digging poles or such like work. As soon as the ground is fairly open, work must commence in earnest. The liability to be obliged to replant seeds killed by cold or wet weather, should discourage no one from committing the seeds early to the soil.

Artichokes.

Seldom cultivated in this country. Fork in a dressing of manure, being careful not to injure the crowns. Salt and wood ashes are useful. Make new beds.

Asparagus.

As soon as danger from frost is past, fork in the manure spread over it last fall, and give a liberal dressing of salt. Make new beds, using 1 or 2-year old plants, which are much better than old roots.

Cabbage and Cauliflower.

Sow early in hot-beds, or boxes. Give constant heat and little air at first, afterwards expose much, to harden for transplanting.

Carrots.

Sow in open ground, well manured.

Cold Frames.

Prepare the plants for removal by continued exposure as the weather grows warmer, but protect from frost. Cabbage, lettuce, celery, etc., may be sowed in the cold frames to advantage at any time after the weather becomes settled.

Cucumbers.

State on bits of sod, and put a few seeds among the earliest lettuce and radish plants in the hot-bed, so that when they are pulled, cucumbers may have the soil and finally overrun the frame.

Draining will benefit any garden where water will stand in post holes 6 hours after heavy rains.

Fruit Trees.

Dwarf pears are the only fruit trees we advise to plant in vegetable gardens. These will grow well, but are apt to be troubled by insects; hence prune and wash such thoroughly.

Grapes.

Uncover vines when the weather is settled, and there is no danger from frost. Fork manure into borders, the earlier the better after they are dry.

Hot-beds for family gardens are best made from the middle to last of the month. Have a good bottom heat and then give abundant air.

Kohl Rabi.

Sow with, and treat like cabbage and cauliflower.

Lettuce.

Sow early in hot-beds and cold-frames; thin, or prick out to four inches or more apart, according to variety, and stir the soil about them to induce heaving.

Manure for the garden should be fine and rich compost. Nothing comes amiss if it be only well rotted. A free use of muck, sods or other vegetable mold is very desirable. Liquid manure, made by using the urine from the cattle stalls or the leachings from dung heap very much diluted, and judiciously applied at evening, will astonishingly increase the products of a garden.

Onions.

Sow black seed early when the ground is warm, not before. Top onions, or potato onions, for early use, may be set in hot-beds, cold-frames, or in the open ground—the earlier the better. Black seed sowed in September affords little buds for this purpose much cheaper than top onions which are generally used.

Peas.

Sow Daniel O'Rourke and Champion of England when the ground is warm; scalding the seed.

Peppers.

Sow in hot-bed where lettuce is pulled.

Radishes.

Sow in hot-beds devoted exclusively to them, and keep the tops as cool as possible.

Rhubarb.

Transplant as soon as the ground is prepared three feet each way.

Sea Kale.

Force early with hot manure, covering the crowns with pots or boxes.

Small Fruits.

Currants and Gooseberries, prune and set cuttings, if not done in September. Raspberries, do not lift or tie to stakes before settled weather.

Strawberries.

Rake off the beds, fork in fine compost with unleached ashes.

Spinach.

Uncover protected beds, loosen the soil, water with liquid manure; sow new beds in warm rich soil.

Turnips.

Sow a few as directed for radishes, and in the open ground.

FLOWER GARDEN AND LAWN.

Wait until the ground is settled warm before exposing tender plants, by removing their winter protection, and before sowing seed. Many of the perennial flowering plants may be divided and re-set: by which an earlier and more perfect bloom will be obtained. Among these are the pæony, dicentra, chrysanthemum, sweet william, hollyhock, be-larkspur, phlox, etc.

Flowering shrubs, especially the early blooming sorts, may also be transplanted as soon as the severity of winter is past and there is no danger of the ground freezing up again. The disturbance of their rootlets, and the openness of the soil about newly planted trees, or shrubs,

render them susceptible to injury from hard freezing.

Cuttings of hardy shrubs, etc., such as altheas, spiræas, weigelas, forsythias, loniceras, and the like, may be taken off early in the month before the buds swell. Keep in boxes of earth or sand in the cellar until planting.

Bulb beds which had a coating of manure, leaves, or straw given them for a winter protection, may be partially or wholly uncovered toward the latter part of the month; whatever covering they have during March should be light and strawy.

Pruning of roses and other flowering shrubs and climbing plants may be done at once. Each plant should be cut back with reference to its flowering habit. By strongly heading back those shrubs which only yield flowers upon the terminal branches or on the old wood, as the magnolia, spiræa, etc., the bloom is nearly destroyed. Roses, especially remon-tants (or "semi-occasional" bloomers) may be cut back severely, and a finer autumn bloom is the result.

Box Edgings.

May be re-set as soon as the soil is in a condition to work. Spread each plant out somewhat fan-shaped, clip off the tops even, and prune the root very close, setting in trench by a line, in sand to secure quick rooting, and pack the earth about the plants with a mallet or pounder.

Grass borders, and turfing generally, may be laid or repaired very early in the season better than later. Let the soil below be mellow, and pack seeds so closely and firmly that there shall be no crevices.

Manure may be purchased at this season rather more favourably, considering everything than at any other time. Manure evenly applied upon the land, whether leached or unleached ashes, nitrates, guano, or ammoniacal water, will each and all produce good results; and the present is the best time to manure shrubbery and ornamental trees of all kinds, for which coarser manures may be used.

Hot-beds made for starting cuttings and for sowing seeds are indispensable on a large place. Green cuttings, or those of soft wooded plants, need considerable bottom heat, and to be kept cool at top until they strike root. Avoid excess of moisture, and give good ventilation, gradually hardening them until they are planted out.

GREEN AND HOT-HOUSES.

The green-houses and conservatories should now be very attractive, although some of the more showy plants will have gone out of bloom. Everything should be kept neat, with no rubbish, plant trimmings, dead leaves, moss covered pots or boxes, left upon the floor or shelves, or dust suffered to collect upon the leaves. The rooms should be aired frequently when the weather is suitable, avoiding a chilling draft directly upon the plants.

Heat must be regulated according to the object in view. If the house is merely a receptacle of plants designed to be kept from the frost, and which are to bloom in the open borders, then a moderate fire heat, with the thermometer from 40° to 45°, is sufficient. With

a collection intended for present flowering, or for inducing a rapid growth to use when the out door planting season arrives, a summer temperature of 65° to 75° is needed; and for orchards and other tropical plants, as also for propagating purposes, the houses or rooms may have a temperature of 90° in the sunshine, which must be allowed to fall off naturally at night.

Acacias, heaths, azaleas, and epacris, should be shaded from the direct rays of the sun.

Annuals.

Sow in pots as occasion offers, for turning out into the borders in May.

Bedding Plants.

Push forward those started last month, pinching in and regulating their shape.

Cacti.

Water those showing flower.

Camelias.

Those which have done flowering, examine for red spider; wash foliage, syringe, and prune.

Carnations.

Make cuttings: set out the old plants for layers; never keep plants more than one winter.

Fuchsias, Chrysanthemums, etc., may be now propagated by cuttings from the new wood. Re-pot and prune established plants.

Geraniums, pelargoniums, Chinese primroses, cinerarias in or near bloom, keep near the glass, turning frequently.

Insects.

Destroy by washing and tobacco fumes.

Pansies are best kept in bold frames, and should be aired and kept back by not admitting the light and heat.

Parlor Plants require even more care than those of the Hot-House. It is an excellent plan to set the pots in larger ones of the same material or of tin, and cover the earth with moss to retain moisture. They will also require frequent turning, especially if growing near the window, to keep them in an erect position. See that the drainage is good and only enough water given to keep the plants in a healthy state; the surface soil may have a dry appearance when there is sufficient moisture at the root. Be sure that there is abundant water always evaporating in the room or in connection with the fire.

Roses.

Established cuttings and plants for out-door blooming, need re-potting.

Water is required in proportion to the growth of plants. As most plants are now pushing out vigorously, syringe the walls and foliage of plants, and wet the floors to induce a moist atmosphere from evaporation. It will also tend to keep insects in check. The water should not be of a much lower temperature than the atmosphere of the house.

GRAPERY AND ORCHARD-HOUSE.

Cold graperies should be thoroughly white-washed, mixing flour of sulphur with the wash; the vines may be lifted as the weather moderates, air given on fine days, and the borders watered with liquid manure. Do not tie up to rafters until all the buds have pushed equally, and keep the house moist when buds are

breaking. In more advanced houses, give abundant air, especially where there is bloom; syringe often; thin out superfluous branches.

Orchard Houses.

Give trees in pots and tubs liquid manure in moderate quantities, syringe wall and floors often, and give air freely on mild days. Prune out the fruit. Trees rooted in the ground require manuring and watering quite freely.

APIARY IN APRIL.

The bees will begin to fly pretty freely this month, and in many places to collect pollen. In some sections but little is to be obtained until quite late, yet the weather is often warm enough for extensive breeding in good stocks, if pollen is abundant. The utility of flour as a substitute for pollen is pretty well established. It is difficult, sometimes, to get them to take it, especially when offered after a little is obtained from the flowers; but when given early, and a taste for it acquired, they will use large quantities. If it were of no use whatever after being taken into the hive, I still think it would pay, by keeping the bees employed while they might be getting in to mischief by quarrelling with, or robbing some of the weaker colonies of the yard, and destroying large numbers. To feed the flour, make a floor several feet square, the size proportioned to the number of stocks. Put it in some warm place within a few rods of the apiary. The unbolted wheat flour is best, but not essential; any kind of flour will probably do; buckwheat, I am informed, has been used extensively. If it has been bolted, mixed with saw-dust, chaff, oats, straw finely cut, or any liquid substance to prevent its adhering too readily to their bodies. Begin by scattering some on the ground or in the grass near the floor; they will usually find it in a few hours. Keep them busy by feeding every fair day. Perhaps a little caution is necessary not to feed too much. Although I have never been able to find any left in the combs at the end of the season, or to discover any bad effect from giving too much, yet I apprehend their combs might be filled with it to the exclusion of brood. It would probably be safe to give what would average two or three pounds to the hive.

If warm weather should make the bees in the house uneasy, the room should be cooled, and the bees quieted, by putting snow or ice on the floor, until a fine day occurs for putting them out. For removing them, choose a clear warm day. When practicable let each hive occupy its old stand. Set out a dozen, and two hours later, as many more. Put the first as far apart as possible, and fill up the vacant stands as others are afterwards brought out; they will mix together less in the confusion of their first issuing, and a less number be lost by entering the wrong hive on returning. Any stock having lost its queen during winter, will be likely to show it near evening of the first day; they fly out freely, by running about in apparent confusion. A queenless colony now should be united with some feeble stock, unless the queenless one is much superior in numbers, and in other respects will make the best stock; in which case, that should receive the bees from the other. The combs and honey of a

queenless, hive, if all right, may be set away for a new swarm, taking care to smoke with brimstone once or twice to destroy the worms as they hatch out. If the colony that contains the queen is the one removed, there will be some broods in the combs necessary to be taken out before putting away. Be careful and not save for a new swarm any combs containing foul brood. Ascertain the strength of each stock by thorough examination some cool morning. Contract the entrance of the weak ones, till only a single bee can pass at once. Watch for robbing bees on the first warm days—it requires close observation to detect it at first. Ascertain which are destitute of stores, and feed as they require it, taking care not to expose any honey where other bees may get to it.

REPORT OF THE HEMP AND FLAX ENCOURAGEMENT SOCIETY.

To the Editor of the Lower Canada Agriculturist.

I believe that it is pretty generally known that the County Jacques Cartier Agricultural Society was organized in the beginning of the year 1862 as a central society for the purpose of encouraging the culture of hemp and flax in the surrounding district.

With a view to carry out the intentions of the society there was a sub-committee appointed, consisting of Joseph Robillard, Esq., St. Ann, and Urgile Valois, Esq., Point Claire, and myself. Being elected Chairman of said Committee, I feel it now to be a duty incumbent upon me to lay before the farmers of Canada and all concerned a few practical facts and results which I have come to the knowledge of, since the organization of the society. I adopt this as being perhaps the best method of answering the numerous enquiries coming to me from all quarters concerning the cultivation, the preparation, and value of hemp or flax as a crop, our knowledge of these as yet must necessarily be very imperfect on account of the short time our attention has been turned to them.

A short time after the organization of the society we obtained from government through the Board of Agriculture the sum of twenty-five pounds for the purpose of importing seed from Europe. We obtained through the agency of Messrs. Lyman and Clare a quantity of flax seed said to be Riga: this seed was not clean but mixed with the seeds of a plant resembling flax in its growth, bearing no fibre but a great number of small seeds, rendering the seed from the crop of much less value than it would have been had the seed been clean; but worst of all this seed cost one pound ten shillings per minot: this nearly upset our scheme altogether. What habitant would think of paying twelve dollars for seed to sow one arpent? The society having bought seed resolved to distribute it at a greatly reduced price; and offering a number of prizes for the best managed fields of hemp and flax not to be less than a quarter of an arpent, they prevailed on quite a number of French Canadians to make a trial. The results are quite satisfactory as far as I can judge. I would also refer to the report of the gentleman who inspected the crops on the fields when just

coming to maturity. It was published in the October number of the Lower Canada Agriculturist for 1862.

The Board of Agriculture also presented the Society with one of Rowan's Patent Scutching Machines, which was entrusted to my care. We have had it in operation for some time past: we think it a very efficient machine, being easily managed, requiring little power to propel it, yet performing a considerable amount of work. The power we have used is a pair of Canadian ponies, or the horse power of a common thrashing machine. I send you along with this three samples of fibre which were dressed with the machine—one of hemp and two of flax. We run the machine against time on the hemp without breaking and bruising the stems in any manner, running them into the machine their whole length. It dressed the hemp at the rate of ten pounds of fibre per hour. The handful I send you is a fair sample of the work done. We also run it against time for two hours on a lot of dew rotted flax from the county of Two Mountains, a sample of which I send you, marked number 1. The amount of the two hours, work was twenty-eight pounds ready for the heckle as you see it. This lot was the produce of sixty perches or six-tenths of an arpent, and produced, when all dressed, 184 pounds of fibre, 92 pounds fit for the heckle the remainder as tow, and 9 minots of seed. The seed sown was Canadian. This was a good lot, but badly managed; the seed was not taken until it was rotted, and then thrashed with a flail; which operation had broken the straw and matted the fibres together to about one third of its length, which accounts for the large proportion of tow. The other sample of flax grew on my own farm from the imported seed. It was sown on the 19th day of May, and harvested in the first week of September; the seed was taken off by slashing it into a large box; this method of thrashing takes off the seed without confusing the straw or injuring the fibre. It was then bound into bundles about 10 inches through, and steeped in a pond of clear soft water for five days. When taken out of the water, it was spread upon the grass until dry, and then carried to the barn; this yielded a much less proportion of tow and more long fibre than the Dew rotted.

The Kemp grew on the same field with flax. The seed was American, bought of M. Lyman and Clare, and cost 14 shillings per minot: it was sown at the rate of two minots per arpent, on the same day the flax was sown; harvested at the same time, steeped the same time in the same water, and treated in every respect same as the flax except that it required no weeding. In this respect it can take care of itself if it be thick enough sown, and once get its head above ground. I could almost recommend it as a weed exterminator if it does not leave its seed in the ground and burn out or weed itself. At the time it was harvested, the male plants were in full blossom and shedding their pollen; the female plants were just coming in flower. They were cut promiscuously. The sample is part of the produce.

I am not prepared at present to say what the value of these plants may be to the Canadian farmer; neither can I say which of the two

will be most profitable. This will depend upon the proper management of them, and the price that can be got for them in the market. I will only state what I know to be facts and let the farmers think for themselves. I have already stated that the society offered prizes for the best managed fields of flax: There were eight prizes awarded. The first prize field had half a minot of imported seed sown, and yielded six minots of seed; a portion of this field was pulled before it was ripe, and that of course yielded no seed. I have not the exact measurement of the land. The second prize had half a minot of imported seed sown; the exact measurement of the land was 33 perches, or one third of an arpent less one third of a perch. This field produced six minots of seed: five and a half was first rate quality and sold at 10 shillings per minot, the other half minot may be worth half that price. It would occupy too much of your space to go into further detail, suffice it to say that I saw all the fields that took prizes when the crop was on the ground; and from first to last I don't think there would be two minots difference of produce seed per arpent. As to the yield of fibre, I can say nothing positively, further than I have stated above. I think the yield may be between three and four hundred pounds per arpent. We may be able to give you something more positive by and by. For my own part I am convinced that the culture of both hemp and flax will prove beneficial to the Canadian farmer. There can be no doubt that the soil and climate is well adapted to the growth of either. There is no good reason why we should depend upon Abram Lincoln's rebels for material to make our bags and sheets, and many other articles of clothing when we can produce a much better article of our own. One bag made from Canadian flax or hemp will stand as much wear as two or three made of cotton. O but cotton used, to be so cheap, may be the reply; yes it has been cheap, assuredly cheap cheapened, by the unpaid labour of men and women stolen from Africa or bred in the border States and sold down South, to raise it; just as our good Queen Victoria's subjects breed and sell their sheep and kine. I trust cotton is now blessedly dear, should it open the eyes of mankind to the great danger of depending upon any single article of either food or clothing no matter how cheaply or easily it may be produced. I have lived to see three famines from this very cause,—two for food and one for clothing. When the wheat fly first devastated Lower Canada the farmers were depending almost entirely on the wheat crop. I don't think that many of us died from starvation; but we had to pay famine prices to our American and Upper Canadian neighbours for Indian Corn to keep our lives in. The Potatoe failure in Ireland was another case in which it is supposed one million of people died of starvation from the circumstance that they depended almost entirely on potatoes as food. Let us then take warning from what we have seen and heard, and endeavour to prevent the recurrence of such calamities, by cultivating a fair proportion of all the different articles of food and clothing with which a beneficent Providence has supplied us, and for which our soil and

climate is found to be adapted. Now, sir, should you condescend to give this paper a place in the columns of your journal, and the samples I send you a place in the Provincial Agricultural Depot, although of very little value in themselves, it may induce others who are much better informed than I am on the subject of which it treats, to compare notes through the columns of the Agriculturist. This would tend to the diffusion of knowledge, and render the Agriculturist more interesting to your readers.

I am, Sir, your obedient servant,

WILLIAM BOA.

St. Laurent, County of Jacques Cartier.

SOME SORGHUM ITEMS.

It is difficult to give a Down-Easter who has never visited the West an adequate idea of the revolution the Sorghum product is working and is likely to work in the husbandry of Western farmers. And this leads me to say here, that I never before saw such an opening for the profitable employment of unemployed capital as is apparent now. Land may be purchased cheap, the tools are at hand with which to work it economically, and without the aid of much manual labor; and the crops that may be grown have no uncertain value and yield a large profit. Witness what I shall write below.

The crop of 1862.

It is large in the aggregate, but it is doubted if the yield of sirup is so large per acre as that of some former seasons. It has been an unfavorable season for the production of the cane in most localities. The spring was late and the seed was not planted early; then it became wet and cold, and the plant did not begin to grow much until after the 1st or 17th of July; and then it grew too rapidly. The weeds meantime advanced faster than the plant,—the ground being so wet this could not be prevented. In some instances it was so wet that no team could travel in it. Hundreds of acres, therefore, were left to themselves, and the weeds overtopped the Sorghum. This, of course, diminished the crop, and prevented many fields being harvested at all.

Good crops follow good culture.

This is an invariable rule, no matter what the character of the product. But it has been strikingly established by the Sorghum crops of the present year. Good culture has doubled and in some instances tripled the product. One gentleman told me he knew of an instance where two fields, adjoining each other, were planted in Sorghum at the same time. The seed germinated equally well in each case. One field received thorough culture; the other was neglected, comparatively. The result was, 300 gallons of sirup to the acre from the cultivated field, and only 80 gallons per acre from the neglected one—a difference of \$55 per acre in favor of the cultivated field, reckoning the sirup at the lowest price paid for the crude article at the farm of the producer.

This is not an exceptionable case by any means. I have listened to just such scathing criticisms upon the kind of husbandry pursued by many farmers, at almost every manufactory I have visited in the West this fall. Good culture pays. Poor culture, or no culture, does not pay.

How much Sorghum pays.

Take the above instance of the farmer who produced 300 gallons per acre. At 25 cents per gallon it yields him \$75 per acre. From this is to be deducted the labour and the interest on the capital employed in its production. It would leave a profit of \$50 per acre without any sort of doubt. But 25 cents per gallon is the minimum price for this product. The price the producer realizes is 25 to 50 cents per gallon depending upon the character of the sirup, the distance from market, &c. From 35 to 40 cents per gallon is paid for the crude article in this city (Chicago) for refining. From this must be deducted freights hither.

But it is the best crop grown this year, where it has been properly cared for. One farmer came to this State from New York State a few years since, and purchased a farm of the Illinois Central Railroad Co. He went into grain growing—small grain. Did not pay expenses. He tried corn, and scarcely made a living.

Was about abandoning the West, when the product from a half acre of Sorghum he had planted attracted his attention. He applied a little arithmetic to the result and figured out future profit. The result was the thorough preparation of 23 acres of land for the Sorghum crop of 1862. It was planted and thoroughly cultivated. He sold the product in this city a few days since, and found the *net profit* of the crop to be \$25 per acre; the first money he had made by farming in Illinois, he said.

Paper from the begasse.

But the sirup it produces is not the only merchantable part of it. It is found to be a better material than straw for the manufacture of paper. It is softer and makes stronger paper. It, however, costs as much to manufacture it, and perhaps a little more, than it does straw. But it is valuable to mix with straw.

It softens the paper. The same process is adopted in its manufacture as in the manufacture of straw, either into wrapping or print paper.

Whether it will render print paper cheaper than it now is, must depend much on the price of bleaching powders. It requires double the amount of these to bleach it, that rags do, and more than straw. A manufacturer asserts, however, that if they succeed in its manufacture into print paper, as there is prospect they will do, it will be found profitable to farmers to dry the begasse and bale it ready for shipment. Hence it will be seen that here is another important item.

It is worth as much per tun to the manufacturer as straw; which is worth two and a half or three dollars per tun. In order to insure a sale of this begasse, it is important that the juice be all crushed out of it. The crushing process is a necessary preparation of the fiber for the paper manufacturer; and it is important that the begasse be dried before fermentation can follow. The value of the fiber is quickly affected by fermentation, and its value for manufacturing purposes thereby depreciated.

There are heaps of it about the various mills in the West, which may be made available to the manufacturer by a little timely effort.

About seed for 1863.

Where and how the seed for the crop of 1863

is to be obtained, is now agitating Sorghum men.

The crop of good seed the present year is said to be small. A gentleman of large experience says he believes two-thirds of the seed grown the past year is mongrel. He had traveled three weeks in Iowa this fall to buy seed, and found but two lots that he would plant. Farmers are careless in planting—plant it too near broom corn, or other allied species with which it will hybridize. But the greatest difficulty seems to be, that care is not taken to select the seed of the best corn—the earliest, purest, and that which yields the greatest amount of saccharine matter—that positive improvement in the character of the crop is not secured, instead of positive deterioration.

A gentleman largely interested in these matters suggest that local-Agricultural Societies could do the community great service by appointing committees or a committee to canvass each township and impress the importance of this case in the selection of seed upon the farmers of said township—selecting, and if necessary purchasing, the best seed that can be found. Such committees might do great good; and every man who regards this an important matter may profitably (to the country) employ his personal influence in his neighborhood in this direction. It can be procured from the Provincial Agricultural Depot.

The best soil for Sorghum.

Each year's experience establishes the fact that a light sandy loam, or gravel, or clayey soil is much better for this crop than the black, mucky, prairie soils. This difference is apparent more in the quality of the sirup manufactured than otherwise; but it is found also that the same amount of juice yields a greater amount of saccharine matter. It is found that the crude article of sirup grown on the mucky soils even if as light colored, does not refine as well as that manufactured from cane grown on the light sandy or gravelly soils. Refiners make a difference in the prices they pay for sirup, in favor of that grown on these light and clayey soils.

How to get Sugar from Sorghum,

I find that men who are best posted, and who have had the aid of chemical investigation, in forming their conclusions, have about abandoned the hope of precipitating sugar from Sorghum by rapid evaporation. There is too much grape sugar in it. But they concede that if boiled down to a thick sirup and allowed to remain in a uniform temperature a very large per cent. of it will crystallize.

HOME-MADE MANURE.

In support of my opinion, I beg leave to adduce the words of Boussingault, one of the highest chemical and agricultural authorities, a member of the Institute of France, and a companion of Boit and Dumas. He says: "Soils, to become productive, require the intervention of manure; for this there is no substitute, neither the labor which breaks them up nor the climate which so powerfully promotes their fecundity, nor the salts and alkalies, which are such useful auxiliaries of vegetation. Particular cultures may require particular manures. But farm dung, when it is derived from good feeding supplied to

animals with suitable and abundant litter, affords all the principles necessary to the development of plants; and such manures contain at once all the usual organization of plants, and all the mineral substances which are distributed through their tissues; in fact, carbon, nitrogen, hydrogen, and oxygen are found therein, united with the phosphates, sulphates, chlorides," &c. This being my own conviction, I have uniformly said to persons consulting me upon the subject: make all the manure you can from your animals, your straw, your leaves, your swamp mud, ashes, soot, and small charcoal. Let not disagreeable odor escape from offalls of any description. Neglect not dead animals that have perished by disease or accident, whether large or small, from a horse to a chicken. Have capacious receptacles prepared for whatever can be converted into manure. Let the bottom of these pits be lined with clay or water cement, and the surface screened from the sun. Into these cast all manner of animal or vegetable refuse; taking especial care to enrich the aggregate by additions of the liquid drainings from the stables, and of urine from the houses. Remember that a gallon of this last is often worth a barrow load of what is called cattle pen manure, prepared as it now is over large sandy areas exposed to the full action of the sun. The tests for the proper management of these artificial manure pits are, that the nose shall detect no gaseous emanation from their surface, and that no water shall trickle away from beneath that shall possess either color or flavor. It has always struck me that there exists great

improvidence on plantations as to the preservation of animal manures. Night soil seems to be unknown. Why is this? Is the cultivator ashamed to utilize substances which constitute elsewhere the peculiar wealth of the agriculturist? Let us not forget that the grand duke of Tuscany enjoys the much envied monopoly of all the privies of Florence; or that the Chinese who are the best agriculturists in the world, owe their success to the almost religious care with which they treasure up every species of animal reliquia. Hog-pen manure with us (in South Carolina) is totally neglected; and the crops get no nitrogenized material from either of the sources here referred to, while the fixed constituents belonging to each matter are so broadly scattered as to be almost wholly useless. When all the animal matter within reach has been secured; when the straw, bones and vegetable trash of every description has been duly husbanded; when marl, if accessible, has been liberally applied, both in its natural and calcined state; when all this has been done, then, I would say, engage freely but intelligently in the use of guanos and manipulated fertilizers; but until then, I would counsel reserve and caution, lest under the prevailing neglect of genuine manures, and the substitution, therefore, of artificial compounds, you complete the destruction of lands already much wasted, and bring about, at no distant day, a sterility as hopeless of redemption as the deserts of Babylonia and Assyria.

—Prof. Shephard, in Patent Office Report for 1861.

BREEDER'S DEPARTMENT.

RULES FOR MANAGEMENT OF COWS.



—WALKER S.

Never buy a cow of a dairyman, for if he is a good manager he will sell only his poor animals.

To determine which cows are best for keeping, try their milk separately, and weigh the butter—for sometimes a cow may give much milk and little butter, and *vice versa*.

Cows should run dry six weeks before calving—if milked closely towards calving, the calves will be poorer.

A cow newly come in, should not drink cold water in cold weather, but moderately warm slop. Calves intended for raising, should be

taken from the cow within a few days, and they will be less liable to suck when old. Feed them first with new milk for a time—then skim milk—then sour milk—taking care that all changes are gradual, by adding only a portion first, and add gradually a little meal.

Calves well fed and taken care of, with a quart or two of meal daily in winter, will be double the size at two years they would have attained by common treatment.

Heifers thus treated may come in at two years old, and will be better than neglected animals at three, and one year of feeding saved.

Hearty eaters are desirable for cows, and they may usually be selected while calves. A dainty calf will be a dainty cow.

Heifers should become accustomed to be freely handled before calving, and drawing the teats. They will then not be difficult to milk. Begin gradually, and never startle them.

In milking cows, divide the time as nearly as practicable between morning and evening, especially at time of early grass, that the udder may not suffer.

Persons who milk should keep the nails out short—animals are sometimes hurt with sharp nails, and unjustly charged, with restlessness.

Old cows should be fattened at 15 years. The dairyman, therefore, who has 15 cows, should raise a heifer calf every year to supply the vacancy—if the herd is 30 cows, he should

raise two calves, and so forth.

Heifers dried up too early after calving, will always run dry about the same time in after years—therefore, be careful to milk closely the first year, until about six weeks before calving.

Spring cows should come in while they are yet fed on hay, and before they are turned to grass, which will be more likely to prevent caked bag and milk fever.

EARLY CARE OF FATTENING ANIMALS.

Almost every farmer fattens annually a supply of pork and beef for home consumption and of the former, many who do not claim to be farmers, grow more or less, while the markets are largely supplied from the "few to sell," kept by every occupant of a farm. Yet, with all this experience, from the want of the best management this fattening is at least one-fourth more expensive than it need to be. A proper system of care and feeding would produce results so superior to those commonly attained as to astonish the majority of farmers. We propose to offer some thoughts on two errors in the rearing of our pork and beef, which although often shown up, still prevail far too widely among us.

The first is the neglect of the growing animal before the fattening process is begun. A pig, for instance, should live only to make pork—should be kept growing from birth until fit for the butcher. But this treatment is seldom given, save by those who seek to make pork of pigs at eight to ten months old. Some few are very successful in this; others attempt it and fail—and most frequently fail from not keeping up in the animal the most rapid growth consistent with health and vigor. Others (in the case of swine) feed well for a time; but in autumn, when from short pastures the dairy slops decrease, and the pumpkins, apples, and small potatoes, are not yet ripe or convenient for feeding, no provision is made to supply the lack, and the pigs cease to fatten if they do not fall away, and their thrift receives a check from which they do not easily recover. By-and-by the farmer begins in earnest to fatten them, but finds that it takes as much extra feed to get them improving again, as it would to have kept them during this interval in the best condition, and that he has lost all they would have gained—from one to two pounds per day by this want of better management.

In making beef we lose from the same causes. A calf kept winter and summer in thrifty growth, at two years old will make as much or more beef than one neglectfully kept at twice the age. The profit will all be found on the side of the two-year old, the loss on the four-year old; yet the owner of the latter has pursued his system, if system it may be called, with the idea that he was saving money. Keep the thrifty animal two years longer in the same way, and something really handsome in the way of beef will be the result; but the starving can never pay the expense of its rearing and feeding. We do not pretend to say that farmers usually neglect their stock to so great an extent; but we do say from what we see and know, that a

large majority of them lose largely from neglect in this direction.

Another source of loss, arising from want of timely attention, is found in the delay to commence seasonably—early in autumn—the fattening process. The animal heat is kept up at the expense of the food consumed—in mild weather that is converted into fat, which in cold is burned up as fuel. It is as much burned up as the wood with which we feed our stoves, in reality, though by a different process. This has been fully and repeatedly explained, and ought to be well understood; still we find many farmers neglect to take advantage of this physiological fact in the care of their animals. In severe cold weather, under the usual exposure, no improvement can be made even with the most liberal feeding, and comparatively mild winter weather is far less favorable than autumn for fattening.

Much food is wasted by the delay in its consumption by fattening and dairy stock. We see, every year, tons of pumpkins frozen and lost, which would have helped largely as the grass began to fail, and should have been fed out from the time of the first frost until all were used; while hundreds of bushels of fruit, apples particularly, rot under the trees or are made into cider without profit, which might have been converted into pork or beef and butter; and large quantities of roots and vegetables are wasted, or only partially used, without care or economy in collecting or feeding. These should not alone be depended upon, of course, but with more nutritious food, ground, and cooked or fermented for swine, a good start would be given at but slight expense to our fattening animals. Before Christmas the process could be completed—often before Thanksgiving-day would be the better period. The markets are quite as favorable, take the extra expense of winter fattening into account, in November, as later in the season.

Various other considerations in regard to the early care of fattening animals occur to us, which will also suggest themselves to our readers; but we propose again to recur to the subject, more particularly to the most economical methods of feeding for the butcher.

OVERWORKING OF YOUNG HORSES.

No animal is capable of severe and continued exertion until it has reached maturity. It is only when the body has ceased to grow that its several parts attain their full amount of strength and power, and become capable of performing their allotted tasks easily and satisfactorily. It is well known that young men, however active and willing, succumb more readily to fatigue and disease than those whose frames are more thoroughly knit, and whose full strength is attained. This is well established in the case of navvies, and more especially in that of troops on long marches or in active service. Napoleon, after the battle of Leipsic, wrote, "I must have grown men; boys only serve to fill the hospitals and encumber the roadside." The same fact was also prominently shown in the Crimean campaign; and Lord Raglan writing to the Duke of Newcastle, complained that several detachments of troops sent out were "so young and unformed, that they fell early

victims to disease, and were swept away like flies."

But youth and immaturity prove the ruin not only of young soldiers, but also of young horses. No variety of mismanagement interferes, more frequently and seriously, with the health and usefulness of this noble animal than the cruel and senseless practice of putting him when too young to work for which he is unfitted. Until he is six, the horse does not reach his full maturity of size or strength. Until then his work induces an undue amount of tear and wear, and renders him prematurely aged. The early and injudicious work tells most speedily and surely on the limbs; of which the bones, muscles and tendons, only become tough, firm, and consolidated as maturity is slowly reached. Any one who is fortunate enough to possess a hack or hunter that has been gently broken in at four, allowed to run almost idle and grow until five, and then brought gradually and judiciously to work at six, may be able to appreciate the force of these remarks. Such an animal, if well selected, will possess the invaluable, but nevertheless rare qualities of straight, strong, clear sound limbs, safe good action, and will, moreover, last ten or fifteen years longer than the unfortunate brute that has been put to work—as so many are—at three years old.

But even before they are two, many thoroughbred colts are subjected to the severe training requisite for competing creditably for any of the great prizes of the turf. A large proportion break down under this unnatural treatment.

The bones are soft and spongy, and ill able to withstand the jar and strain; which excites inflammation of the periosteal or investing membrane, and thus causes spavins, splints, and other such enlargements, and also brings on that still more intractable complaint known as sore shins. The muscles and tendons of these young animals, further, want that firmness and toughness which age and condition alone can give. Little wonder, then, that so many are speedily rendered useless, that their limbs become stiff and tottering, and that by the time they are four years old, instead of possessing strength, endurance, and speed, they are stale, crippled, and useless. Nor is this early and ruinous work confined to race horses. It affects more or less injuriously all our lighter sorts; and the evil is further increased by the practice, so common amongst Irish and other dealers, of removing the nippers in regular succession eight or ten months before they would be naturally cast, and thus passing off the horse as a year older than he really is.

On account of this device many sensible and humane men are thus unwittingly using well-grown four year olds for the full work to which they should scarcely be put at five. The extra demand for horses in London this summer has brought into the shafts of the street vehicles an unusual number of young and unseasoned cattle, and several of the cab proprietors not only complain of the unusual losses they have consequently sustained, both from increased sickness and mortality, but consider that their loss, especially among these raw recruits, would have been greatly augmented had the summer happened to be a warm one.

Mistakes as to the age of horses, which are greatly more common than might be supposed, bring many four year olds into the hunting field, and if the animals are well bred and courageous and disdain to show the white feather, they are apt to be permanently injured, especially in their legs. To this impatient and senseless practice of hunting four and five year olds, is mainly owing the difficulty of procuring good sound seasoned hunters. Over worked and strained almost before they ought to go out of the yard or paddock, they become prematurely aged, stand over at the knee, their tendons are thickened from repeated strains, their joints full and enlarged from the hard fast work, and their bones exostosed from the concussion of the galloping and leaping.

Farm horses worked slowly and steadily, and generally on the soft land, suffer less if put to work early, whilst the long teams in which they are usually put in England afford good exercise without severer training work. Agricultural colts may with propriety be broken in, and gently worked at three years old, but should afterwards have four or five months run at grass before coming in to work in the busy autumn months.

INJURY OF THE FOOT OF A HORSE FROM A NAIL

I would be obliged by you giving me your advice regarding a mare of mine that picked up a large nail in the heart of the foot about a fortnight ago. I sent for the smith and had the shoe taken off, the foot properly paired, and have been keeping bran poultices to it since; she has been suffering great pain and got very feverish at times. I had her bled at the neck, and have given her a few laxative boluses at different times. She still eats her meal wonderfully well—bran mash and boiled barley. The sore foot as now broken out at the fetlock joint, and discharging a great deal of matter, which I think has relieved the pain in the sore-foot very much. When standing she seems now to have as much pain in the other leg as the sore one, which is very much swollen. She has now got very weak and not able to get up without assistance, and when up she stands till she falls over from perspiring with weakness.—A SUBSCRIBER. Your case is, we fear, a desperate one, and unlikely to terminate favourably. As is usual in such severe cases of injury of the foot, there is a great amount of constitutional fever, whilst the continual weight borne by the sound limb is extremely apt to produce in it strain and inflammation of the laminae. We saw last week a valuable cart-horse that suffered for three weeks from an injury such as you describe, and died worn out with the irritative fever. The injured foot was then nearly well, but the other with bad so long borne the animal's weight was affected with laminitis, and the whole limb was swollen and congested. In such cases, unless the horse will lie contentedly, it is well to sling him, keeping him only so high that he can just touch the ground, and thus balance himself without bearing the entire weight upon his limbs. From the bursting out of the matter above the fetlock we suspect a sufficient opening was not in the first instance

made below to allow of the natural descent of the matter formed. This was unfortunate, and must, of course, have greatly increased not only the animal's sufferings, but also greatly extended the duration and severity of the case. Whenever a horse "picks up a nail" or other such body, it ought to be at once withdrawn, and the hole by which it entered freely laid open, and kept open, so as to facilitate the outpouring of any matter that may be formed in the deeper-seated portions of the wound. After a thorough washing, a bran poultice should be applied, and, to insure the wound being kept clean, and prevent the insinuation of any dirt, the patient should not be worked for a few days, or, indeed, until the lameness disappears. If for a time the poy or sole remains tender, a little wet lint may be kept applied, covered by a leather pad, which, if the animal is required for light work, may be retained in its place by a shoe lightly tacked on. If the deep-seated structures of the foot are still free from disease—if the other link does not seriously fail, and the animal's strength can be supported, your patient may possibly still recover. Free vent must be procured for the matter, and if it is abundant, a dependent orifice should if possible be obtained, when the wound above will speedily heal up. Lint, saturated with cold water, and covered with a piece of gutta-percha cloth, will be better than a continuance of the poultice. Continue to feed liberally; give as a stimulating tonic three or four times daily, a quart of good ale; keep the bowels open with meshes, and avoid reducing the strength either by bleeding or physic.

SHEEP AND WOOL.

You ask me to write for you on sheep. Perhaps I may do so occasionally, if I find anything which I think worth saying. There is a point in my report to which I would wish to call general attention; and I trust, when you get the paper, you will make the remark, I there submit on the subject, the text of an earnest appeal to the sheep-breeders of Ohio. I refer to *fitting up sheep for sale*, by special treatment, intended for that and no other object. This treatment consists in shearing the sheep a month or two in advance of the usual time; sheltering them from rain storms throughout the entire year; housing them nights, throughout the year, except during two and a half or three of the warmest months, and pampering them with high feed.

All of these practices are beginning to be indulged in extensively, by breeders proper, i.e., those who look for their main profits from the annual sale of rams and ewes for breeding, instead of the annual sale of wool, and mere surplus sheep. The object is obvious. A ram, exhibited in the fall with two months' extra wool on, wholly outshines one sheared at the common time. If housed through the season from storms, and from dew also, after say the middle of August, he is a far darker colored sheep. If pampered, he is larger, rounder, more compact in build, and has the appearance of being shorter legged. Besides, the additional yolk, ("gum" and "oil,") preserved on and in the wool, by sheltering, is a most

important auxiliary to the weight of those "brag" fleeces, which is to be proclaimed to the world. Pampering, of itself, not only increases the amount of yolk, but it increases the actual amount of wool. A flock of ewes may be made to yield a pound of wool more a head, by very high keep; and on a large ram a difference of two or three pounds can be thus made.

Mere early shearing, and summer sheltering, are not fraudulent, if frankly avowed (and avowed to the purchaser, whether he thinks to make inquiry or not), but of what real use are they, unless they are expected to mislead somebody's judgment, by making the sheep appear better than they are? If proclaimed with a trumpet, in the ear of the inexperienced buyer, still, they would not prevent his fancy from controlling his choice.

They are expensive. The large flock-master would find them very impracticable. Should the true breeder wish to get advantage of his neighbor by such means? The common excuse among breeders is that they must do it to keep up with their neighbors.

Waiving all imputations of fraud, would it not be better and manlier for all breeders to stand on, and start from the same ground, in their rivalry, and *that* the ground of nature and old usage?

Pampering stands in another and worse category. This materially and permanently damages the sheep. It impairs the constitution. A sheep which has been fed very highly with grain, in the fall and winter, for one or two years, to fit it for show, and to obtain a great fleece, is like a spent hot-bed, so far as future production is concerned. Even the natural weight of fleece will not again be produced.—It requires great skill to keep such a sheep in health, and the least casualty will prove fatal to it. It has lived too fast, and its vital energies are burnt out.

Some credulous young beginner buys a ram, and half-a-dozen ewes, which have been thus treated. They have yielded monster fleeces, and he pays a monster price for them. He can scarcely raise lambs from them. They often die within the first or second year. If the seller did not apprise the buyer, both of the facts and their consequences, what is he better morally than a swindler. Even the ethics of horse-jockeyism would not tolerate the idea that an animal may, with propriety, be secretly *injured* to fit it for sale.

I understand that sheep-jockeying has made but very small progress in Ohio. I should expect this. Nature acted on too grand a scale, when she laid out your noble State, to make such petty and paltry trickeries necessary, or appropriate to your people. But there is contagion in bad example, and especially in the cunning practices and preparations of rivals in breeding.

But if the agricultural press will do its whole duty fearlessly; in such matters, if it will call things by their right names, and denounce that as unmanly which is unmanly, and that as infamous which is infamous—the practices which I have described will not extend beyond their present limits, and will only be resorted to with-

in those limits by those who are willing to be

Our agricultural societies ought to require every exhibitor of sheep, at their fairs, to state explicitly the day on which those sheep were stigmatized as two-penny tricksters. previously sheared, and whether they have been housed from storms, or fed anything but grass between the 1st of May and the 1st of December.

One more point I would call your attention to, which is barely alluded to in my recent report. We need better and more definite statistics of breeding flocks than we now obtain. If A tells me that he procures five pounds of washed wool per head, from a flock of sheep containing so many rams, ewes and wethers, he gives me a very indefinite piece of information. If he gives their respective ages, he vastly adds to the information; but it is still indefinite. To judge accurately of the value and profitableness of his flock, for wool production, I must know how much wool he obtains from amount of feed. Am I told that, as a general thing, it is not conveniently practicable to obtain this information?—Well it is at least easy enough to find the comparative product to consumption, as between different flocks. Speaking in general, sheep unquestionably consume in proportion to their weight. Those of the same breed and habits consume in the same proportion. Thus the several varieties of the Merino, daily consume about one-thirtieth of their weight of good hay in winter, and an equivalent of green feed in summer.

The flock, then, which produces most wool, in proportion to weight of carcass, is, other things being equal, most profitable. And between extremes of size, other things should be about equal, in a sheep kept mainly for wool production, and for the increase of its kind. Large size is not desirable *per se* in such sheep. By an invariable law of matter, small spheres or spheroidal bodies, like the carcass of a sheep, have more surface, in proportion to weight and diameter, than larger ones. For example, a round shot, two inches in diameter weighs 1.092 pounds, and has 11.50 inches of surface to one pound weight; while a shot eight inches in diameter weighs 69.889 pounds, and has 2.87 inches of surface to the pound. This enormous disparity, in proportionable surface, diminishes, as between larger spheres, but still it is a material one, between a sheep weighing one hundred, and another weighing one hundred and fifty pounds. Too small sheep, however, are objectionable, on several almost obvious grounds, (which I have not space now to point out,) and, all things considered, fair, plump, medium size, for the breed, is the best one.

RULE TO DETERMINE THE WEIGHT OF ANIMALS.

Butchers and cattle dealers buy cattle and swine often by estimated weight; and by much practice can judge, perhaps, very nearly the true weight. In this respect they have an advantage over the farmer, from whom they buy.

As it seems desirable that the buyer and seller should be on equal footing, I give you a simple rule by which to estimate the weight of cattle and swine. I gave the same once before in the Farmer, and invited those who had opportunity, (*viz.*, all farmers who are slaughtering their

winter stock of meat,) to test the rule by trial, and report the results. No one has responded, from which I infer that it is generally considered a humbug not worth the trial. I have since had opportunity to verify it in several instances, in two only of which has the actual weight by the scales, varied *four pounds* from the estimated weight by the rule. The one case, a very poor steer, fell short six per cent; the other case, a very fat hog, overran six per cent. I am satisfied that by applying this rule, no farmer need be in doubt as to the weight of any animal within twenty pounds, and with a little practice and observation, even nearer than this. I give the rule again, as follows: Multiply the length, (measured from the point of the shoulder to the extreme of the buttock,) in inches, by the square of the number of inches of girth and divide this product by five hundred and fifteen. For lean cattle deduct six per cent—for very fat cattle add six per cent. In the measurement of hogs, as the head makes part of the weight, a little more length must be allowed, *viz.*, measure forward to such point (as near as can be judged,) as that the head and neck, if evenly distributed over it, would make it the size of the body.

CHANGE OF PASTURES.

In an essay on Dairy Farming, by X. A. Willard in the Transactions of the New-York State Agricultural Society for 1861, the following remarks occur on change of pastures for cows—a subject on which there has heretofore been some difference of opinion among farmers:—

The practice, which obtains with some, of dividing the pastures into separate fields, and changing the herd, every week or two from field to field, is now generally disapproved of by our best dairymen.

Cows confined to one field are more quiet and contented—they will usually go over in the course of the day every portion of the field, selecting their food, and when filled they lie down to rest, and *manufacture grass into milk*.

All extra labor, excitement and gluttonous feeding, from an over stimulated appetite, lessens the quantity of milk. Everything about the "every day pasture," is familiar, and if food is abundant they have no thought beyond leisurely taking their meals, and reclining at ease on some favorite spot, ruminating or dosing over their "*knitlin work*," as Mr. Fish aptly terms it—no shadow of discontent clouding their peaceful, and seemingly happy existence.

But let a bite of grass in new fields be had, and all this is changed—they overfeed, and in consequence their health is more or less deranged; they tramp round in every nook and corner of the field, in search of dainties—become restless or discontented, and not unfrequently some of the more active and enterprising members of the herd, try fences and make excursions into fields of grain and prohibited crops.

We have seen herds with one or two unruly disposed members, though perfectly quiet and orderly while confined to one pasture, become so restless and discontented from a change to new fields, as to become exceedingly troublesome, and to cause serious loss.

There are other reasons—the cost of building and maintaining a division fence is a

considerable item. The pastures, too, will not be so uniformly cropped; large portions will get a rank growth, be rejected by stock and therefore afford less nutritious food through the season, than when used as one pasture. Fresh pastures are more apt to produce scours, as is well known, deranging the appetite and health, to a greater extent than when confined to one field. The argument generally used, in favor of two pastures in that the daily tramping of the cattle on the one pasture renders the food less fresh and palatable, and that the alternate pastures obviate this giving time for grass to grow, and thus producing more food and better results. The conclusion arrived at is not true in fact stock when turned into a new pasture do not rest until they have roamed over and examined every part of it, and will tramp down, soil and destroy more food than if the same land was in one pasture, thereby really affording or rendering available, a less amount of nutritious food during the season to the herd.

Cattle, it is true, like a change of food; but this change should exist in the varieties of grass, in the same pasture, and not in different fields. Of course the aftermath and gleanings from grain fields, are to be consumed by stock in the fall, as deemed expedient, but the summer pasture should be one field, as productive of more milk with less trouble, expense and loss.

THE VALUE OF A DEAD HORSE.

Dr. Lankester says, the value of a dead horse is from 20s. to 60s., the average value 40s. [or \$10]; the weight in pounds is from 672 to 1138, the average weight in pounds 950.

Recollect that every application to art or science of this dead horse renders him of greater value; and it is for us, engaged in various ways in the arts of life, to see whether we cannot apply things that have hitherto been wasted. Five hundred horses die every week in London. The hair is worth from 8d. to 1s. per lb., and is used for making haircloth, for stuffing mattresses, and making plumes, and bags for crushing seed in oil mills. Then the

hide, weighing 30 lbs., is worth 8s., which is perhaps, not a great deal of money; but when you have from 300 to 500 a week dying within a radius of five miles from Charing-cross, it comes to some money. The skin is used for a variety of purposes; and tendons, you know, are made into gelatine, and glue, and jellies.

When the poor old horse has drawn your carriage, served you in omnibus and cab, and died at last, even then you have not done with him, for his tendons then serve you for delicious jellies. Then, again, it is not an uncommon thing for a man to eat horse flesh. We do not eat it here knowingly; but they eat it on the continent of Europe. Then there is the blood, which is carried to the prussiate of potash manufacturers. Then there are the internal tubes, which are used for the covering of sausages: and, like the jellies, we need not ask any questions about these coverings as long as they are sweet. The heart and tongue are evidently great "mysteries," for no one knows what is done with them. There is almost as much mystery about them as about the manufacture of the cloth of your coat. The hide, however, can be chopped up and mixed with sausage meat, and the tongues may be sold as ox tongues. On a recent occasion, when I stated this fact, a newspaper which reported the lecture, added that it was all a mistake, for the tongues were never sold for so inferior an article as ox tongues, that they were always sold as reindeer tongues. Now, passing over the fat, which is worth 3s. 4d., I need not tell you that horses' bones are as good as any other bones, and can be employed for the various purposes to which other bones are applied.

The bones of a horse weigh about 160 lbs., and are worth 4s. 6d. per cwt. Then there are the hoofs; 6 lbs. of these, at 8s. 10d. per cwt. which can be used for making buttons, prussiates, and snuff-boxes. I do not think, that it is correct to say that they are used in making glue. I think horses' hoofs are composed of the same material as hair. They are sold, it is true, to the glue maker, but he sells them to the prussiate manufacturer.

MANUFACTURING REVIEW.

APRIL.

CONTENTS:—The new bill on inventions and patents, as presented by the Hon. Minister of Agriculture and now under the consideration of the Legislative Assembly—Mending water pipes.

INVENTIONS.

We have received a copy of the Bill respecting inventions, trade manufactures and designs, introduced into the Legislative Assembly, by the Hon. Mr. Evanturel, Minister of Agriculture and as its provisions will affect inventions of all classes, we deem it will not be considered *mal à propos* to refer to it here.

The desirability of a change in our law respecting inventions has been frequently expressed; and annually our Boards of Arts and Manufactures have petitioned parliament for such changes, as in their opinion, would do away with the unjustly discriminating features of

our law and improve the value of our patents first, by ascertaining by examination the novelty of the invention; and secondly, by preventing the issue of undue monopolies. Animated with this desire the Board of Arts and Manufactures for Lower Canada prepared a bill on this subject which, was introduced into the last session of parliament by Christopher Dunkin, M.P.P., but was not proceeded with. This Bill met with the hearty approval of the Board for Upper Canada. It was reviewed at length in the Scientific American by Judge Mason, Ex-Commissioner of Patents for the United States, concluding as fol-

lows: "We feel highly gratified to witness its appearance; and with some changes, which a more careful consideration will doubtless suggest, it may be rendered a model law, worthy of the imitation of every nation of Christendom."

The principal features were the establishment of a Patent Bureau with a Commissioner permanently at its head, and a Patent Board, to be composed of the President of Council, the Commissioner of Patents, and the Attorneys General and Solicitors General of Upper and Lower Canada, a "Register of Patents" and a "Register of Proprietors." It provided for a reference to experts, to be named by the Boards of Arts and Manufactures, in case of difficulty with the Commissioner, and gave the experts power to summon witnesses as in civil suits. It proposes to do away with the illiberal and obnoxious limitation of the grant to resident Canadians, and obliged non-residents to manufacture in reasonable quantities in the province, prohibiting the importation of articles patented here. It provided for provisional protection, by which the inventor, before applying for his patent is allowed six months to work out his invention without fear of piracy. It also provided for temporary protection, thus enabling the patentee to look about before incurring the full fees which, in the case of a poor inventor, is a very desirable provision. It also provided for the repealing of patents improperly obtained. It provided for the manner of conducting suits for infringement, and authorized the judges to issue injunctions to prohibit the manufacture of the article by either party during the progress of the suit; and also provided for the Registration of Trade Marks and Designs.

The Bill now before the Legislative Assembly is based upon that we have just noticed but is considerably shorter. It provides for a Patent office and a Patent Commissioner, which office shall be attached to the Bureau of Agriculture; and, unless otherwise provided, the Minister of Agriculture shall be the Commissioner of Patents. The whole work of the office devolves on the Commissioner without making any provision for a reference to the Law officers of the Crown. It omits the provisions respecting provisional and temporal protection, as also those respecting the repeal of Letters Patent, and the conduct of suits for infringe-

ment. It grants patents without respect to the nationality of the Inventor, and thereby opens the way to the honest Inventor and to the introduction of foreign capital into this country. Its provisions are vastly superior to those now in force and are highly creditable to the government under whose auspices it is introduced. We trust for the sake of our country's name that it will, whether adapted to meet the wishes of the Boards of Arts and Manufactures or not, become law and take the place of the narrow-minded, illiberal and unjust law which now cumber our statute book; and we are sure all our readers will join us heartily in giving due credit to the Macdonald-Scotte administration for their patriotism and devotion in this matter; the result of which will be that the whole American market will be thrown open to Canadian inventors, instead of being closed to them as it now is by the enormous discriminating fee of \$500.00 imposed upon Canadians applying for patents in the United States.

The lateness of the hour prevents our adding more on this subject in the present issue, but in our next number we will refer to the provisions of this bill, and point out its superiority to the Act now in force at length.

MENDING WATER PIPES.

Many of your readers have doubtless had more or less trouble at some period of their lives in repairing water pipes, where the water could not be shut off, conveniently, at the fountain head or some intermediate point. In going to my office a few days since, my way led past a place where a man was repairing a lead pipe which had been cut off, accidentally, in making an excavation. There was a pressure of water of more than fifty feet head. His plan seemed to me to be novel and ingenious. The two ends of the pipe were plugged, and then a small pile of broken ice and salt was placed around them; in five minutes the water in the pipe was frozen, the plugs removed, a short piece of pipe inserted and perfectly soldered, and in five minutes more the ice in the pipe was thawed and the water flowing freely through it. It seemed to me that so simple a method of doing a somewhat difficult piece of work should be more generally known, and I know of no way of reaching the mechanics of the country so readily as through your columns.

COMMERCIAL REVIEW.

CONTENTS:—Prices current of home and foreign markets.

Potash, per cwt.,	\$6.70 to 6.75	Wheat, U.C. White, per 60 lbs.,	\$0.92 to 0.94
Pearlash, "	6.25 to 6.30	" U.C. Red, "	0.92 to 0.97
Flour, Fine, per 196 lbs.	3.75 to 4.00	Peas, per 66 lbs.,	0.65 to 0.68
No. 2 Superfine,	4.30 to 4.40	Indian Corn, per 56 lbs.,	0.45 to 0.47
No. 1 "	4.55 to 4.60	Barley, per 50 lbs.,	0.95 to 1.00
Fancy "	4.70 to 4.75	Oats, per 40 lbs.,	0.41 to 0.42
Extra "	4.95 to 5.00	Butter, per lb.,	0.15 to 0.16
S. Extra Superfine	5.20 to 5.30	Cheese, per lb.,	0.07 to 0.08

The Produce Market has been very dull through the week. The depressed state of the British Markets, affecting prices here to such an extent, that buyers hold aloof. Butter is almost unsaleable. For Pork there is scarcely any demand.

The insurrection in Poland is looked at with the prospect of a rise in the price of breadstuffs more especially with the probability of an European war, resulting from the present difficulties.