Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

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

- ☐ Coloured pages/ Pages de couleur
- ☑ Pages damaged/ Pages endommagées
- ☑ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☑ Quality of print varies/ Qualité inégale de l'impression
- ☐ Continuous pagination/ Pagination continue
- ☑ Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- ☐ Title page of issue/ Page de titre de la livraison
- ☑ Caption of issue/ Titre de départ de la livraison
- ☐ Masthead/ Générique (périodiques) de la livraison

☑ Additional comments:/ Commentaires supplémentaires: Wrinkled pages may film slightly out of focus.

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

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
						✓					

THE

CANADIAN AGRICULTURIST,

AND

JOURNAL OF TRANSACTIONS

OF THE

Board of Agriculture, Agricultural Association, &c.

PUBLISHED MONTHLY,

AND DEVOTED TO

AGRICULTURE, HORTICULTURE, SCIENCE, AND DOMESTIC ECONOMY.

ILLUSTRATED WITH ENGRAVINGS.

EDITED BY

GEORGE BUCKLAND, PROFESSOR OF AGRICULTURE, &c., AND W. McDOUGALL.

VOL. VII.—1855.

TORONTO:
WILLIAM McDOUGALL, PROPRIETOR.

INDEX.

THE

CANADIAN AGRICULTURIST,

AND JOURNAL OF TRANSACTIONS

OF THE

BOARD OF AGRICULTURE, AGRICULTURAL ASSOCIATION, &c.

VOL. VII. TORONTO, JANUARY, 1855. No. 1.

Agriculture, &c.

TOWNSHIP OF YORK FARMERS' CLUB.

VEGETABLE PHYSIOLOGY.

The following well-written essay was read before the York Township Farmers' Club, by Robert Davis, Esq. The Club is fortunate in being able to number among its members a gentleman of so much intelligence as the author of this essay:—

It is not necessary for me to remark how limited is still the knowledge acquired by the most learned in regard to agricultural chemistry; it is enough for us, as farmers, to know that while others are devoting much time, energy, and skilful research, with little or no pecuniary profit as a stimulus, we, whose business and interest should have prompted enquiry, have been content to remain utterly indifferent to the midnight darkness that envelopes every operation of our calling. The fact may be, perhaps really is, that the chemist has yet done little or practically nothing for the farmer, as a tiller of the soil;—some first principles, however, have certainly been propounded,—analyses have proved constituents, and information most valuable, in a scientific view, arrived at;—but it must be admitted that, for general practical application, chemistry has hitherto placed nothing within the teach of the every-day farmer, by which his ordinary labors are lightened, nor has it reduced the uncertainty by which agricultural results are so invariably characterised. This may not be spoken, however, in disparagement of chemistry as applied to agriculture;—many sound theories are difficult of practical application;—the scientific enquirer is rarely, in this case, a practical operator; while the farmer is quite as unfrequently inquisitive or scientific;—so that the principle demonstrated in the laboratory is lost to all useful purpose by want of intelligent application in the field. Unscientific men are too prone to discredit all *innovations upon long-established practices*, and little short of an instantaneous miracle is necessary to convince them of the absurdity of a usage, which prejudice and custom have familiarized. However desirable, it cannot be expected, that the chemist, whose avocations leave him so little leisure, should become familiar with the details of field labor; while "au contraire," *from the nature of his business, the* farmer has much leisure for the acquirement of that knowledge immediately identical with his interest which chemistry is able to afford. It would seem, therefore, that, if it be essential to combine some scientific knowledge with practical skill in the culture of those products in which the farmer finds a profitable account, at *his door must lie all blame for lack of* those results, to which a more skilful management and improved practice would certainly contribute.

All life is a forced state, springing from those inscrutable laws of nature which a divine omnipotence has created, and controls in providential benevolence to all his creatures. Of all the grand divisions of nature, whether animal, mineral, or vegetable, the most merciful, the most beautiful, the most obvious to our every-day senses, as well as the most indispensable to the sustentation of animal life, is the earth's glorious carpet of vegetation; without which man, and all the varied family of animated nature, would perish—yea, the great globe itself would have

been but a sterile and cheerless waste; the important functions in the economy of nature, which vegetables doubtless perform, would be unfulfilled, and the very breath of heaven turned to poison. But God said, "Let the earth bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit—and it was so."—*Gen.* i.

As in the animal economy, so in the vegetable—a certain organization is requisite;—and this system of organs is required in the vegetable for purposes analogous to those performed by the organs of animals;—namely, to sustain vitality,—to nourish,—and to procreate the species. The principal organs of the vegetable structure are:—

The Seed.	Stem.	Alburnum.	Pistil.
" Corculum.	Pith.	Calyx.	Pericarp.
" Root and	Fibres.	Bark.	Corolla.
" Collett.	Liber.	Stamen.	

And these are conveniently divided into three classes,—as those of *Vitality*,—of *Nutrition*,—and of *Procreation*.

By the organ of *Vitality* we understand that particular part or member which is the germ of, and from which originally springs or emanates the future plant; and is the Corculum of the Seed, from whence proceeds all that is dependent upon the vital principle; containing in itself the elements of an organized being, awaiting only a combination of favorable circumstances to excite its latent powers. The principle of vitality, however, is not always confined to the seed,—it is frequently diffused over the stem, and branches even in the leaves, in the roots, in the crown, and in bulbs and tubes.

The retention of the principle of vitality in seeds passes all calculation, and approaches the marvellous, if not the incredible. Still, we have authenticated facts proving, beyond all question of doubt, the power of revivification after a dormant state of 2,000 or 3,000 years. Some years ago, a bulbous root was taken from the hand of an Egyptian mummy, where it had probably remained for upwards of 2,000 years; upon exposure to the air it germinated; when placed in earth it grew with great rapidity;—and the growth of wheat obtained from a similar source is notorious.

The Nutritive Organs are the roots, with their fibres and spongioles, and the glands and pores of the cuticle; through these the plant is enabled to receive either gaseous or aqueous nutrition, which, after being absorbed, is elaborated, and assimilated with the inherent qualities and characteristics of the plant, of which it becomes a part. It is easy to infer that the growth of these fibres must be somewhat commensurate, and simultaneous, with all other parts, in order to a gradual, and natural development of the whole structure; their tendency is ever to humidity, and they are for the most part averse to light, the exceptions to this being rather from location than from any other cause. The Cellular and Vascular structures of the Stems of Plants become, in their several positions, rather a means of conduction for aqueous food, than organs of nourishment; nevertheless, in either case, each particular structure strongly marks the character of organization. The Vascular having mainly a longitudinal position, appears adapted for conduction of sap lengthwise with the stem,—while in the Cellular structure fluids are able to permeate in all directions—laterally or perpendicularly. The hidden power which elevates the sap, or crude pabulum, to the seat of the equally incomprehensible assimilation, is yet to be discovered;—it has been ascribed to the action of the foliage,—to the sun's influence,—to electric currents,—to capillary attraction,—and to atmospheric pressure;—it may not be improbable that a joint influence of all these agencies may minister to the result, aided by attraction, and chemical combination. The Stem also bears the foliage and fructification.

Procreative Organs are found either in the Seed or Offsetts and layers—but these and all other modes of reproduction only tend to show that the principle of vitality is variously disposed while the true legitimacy (if the term may be used) of the plant can only be found in the seedling.

"Seeds are the oviparous progeny of plants," and it is affirmed that the future plant exists in embryo in the seed. This is somewhat speculative, perhaps, but nothing improbable, if it be admitted that the growth of a plant is but an amplification of, and not an addition to, a pre-existence; the organic structure becomes enlarged by assimilation of vegetable food—were this not so, but dependent upon the fortuitous arrangement by accretion, it would form a very striking coincidence, that any given family of plants should so invariably and for so long a time preserve its specific and peculiar character. Another view of the case, and one mostly favored by chemists, is, that, as the component parts of vegetables are wholly oxygen, hydrogen and carbon, and being endowed with power to extract

these from the earth, air, and water, their growth and development are the results of the exercise of this power. It cannot be doubted that there is much reason in this view; but whether the organized arrangements are due to these combinations alone, would appear somewhat questionable; perhaps a middle view would approach the true case,—the rudiments all being pre-existent, but dormant, requiring primarily the exciting cause, and subsequently the nourishment which these chemical agents are capable to afford.

There are other parts of the organic structure of plants which may merely be mentioned in passing—as the *collett* or *crown* of the roots; —that part which divides the stem or stalk from the roots in young plants, is almost entirely lost in the maturity of some. The *Pith* occupies the centre of the stem, and appears to be a cellular substance, spongeous, and absorbent, very permeable, having hollow, open interstices, which act as ducts, and receptacles of gas and fluids. The functions of the pith appear temporary—ultimately ceasing with the age of the plant;—in hollow stems pith is only to be found at the articulations.

The Bark—the Liber—and the Alburnum—it is not here necessary to mention further than as parts of vegetable organization; they belong chiefly, or at least more markedly, to the larger class of plants. The flowering, or procreative organs, as the Calyx, Corolla, Pistil, Stamen, Pericarp, &c., appear, at first sight, of secondary importance, but, when it is considered that sexual intercourse is as indispensable to the consummation of the fecundative power in plants, as in animals, their necessity and usefulness can no longer be lightly valued.

From the consideration of the Structure, it is natural to enquire the means by which the vivifying principle is excited, the organization developed, and the life and health of the plant sustained.

The exciting causes of germination are air, heat, and moisture, and of these agencies a happy combination is indispensable, for air and moisture, without heat, would fail to excite the vivifaction; while heat and moisture, or, air and heat, alone, would be equally inefficacious. The temperature of the air and top soil in spring is probably between 40 and 50 degrees of Fahrenheit; this natural temperature is increased, perhaps, as regards the germinating subject, by some slight fermentation which takes place in the conversion of the superabundant carbon and mucilage; for, so long as the seed remains *cool* or dry, or excluded from the *air*, its dormancy continues, and its load of carbon remains intact. As soon, however, as circumstances combine to excite the living principle, and germination commences, a new substance is formed from the alburnum of the seed, called diastase, whose province would seem to be to convert the insoluble starch of the seed into dextria and sugar, for the support of the embryo plant;—there is small doubt but chemists have been splitting hairs in the dark, and have mystified what nature performs in a more simple way than this, and. Professor Lindley, in his "Theory of Horticulture," states that:—"The embryo which the seed contains swells and bursts through its integuments,—it then lengthens, first in a direction downwards, next in an upward direction, thus forming a centre, or axis, around which other parts are formed. No known power can overcome this tendency, on the part of the embryo, to elevate one portion in the air, and to bury the other in the earth, but it is an inherent property, with which Nature has endowed seed, in order to insure the young parts when first called into life, each finding itself in the situation most suitable to its existence,—that is to say, the root in the earth, the stem in the air."

Almost every one is familiar with the peculiar sweetness which very young plants possess; this sweetness arises from what chemists designate as "grape sugar:"—"With the assistance of this saccharine secretion, the root, technically called the radicle, at first a mere point, or rounded cone, extends and pierces the earth in search of food; the young stem rises and unfolds its cotyledons, or rudimentary leaves, which, if they are exposed to light, decompose carbonic acid, fix the carbon, become green, and form the matter by which all pre-existing parts are solidified. And thus a plant is born into the world; its first act having been to deprive itself of a principle (carbon) which, in superabundance, prevents its growth, but, in some other proportion, is essential to its existence." In this last passage, the Doctor has not used that lucidity for which his expositions are in general so remarkable; he doubtless means that the seed germinates under opposite circumstances to those which must contribute to support the future plant. In light, plants give off oxygen, but oxygen is necessary to the decomposition of the superabundant carbon and mucilage of the seed; hence it may be

inferred that an absence of light is friendly to germination, and readily conduces to the disengagement of carbonic acid.

In this way have plants their infancy, with habits and wants almost the opposite to their requirements in a more mature state;—the excitement of their latent vitality dependent upon causes in some sense inimical to the welfare of the future plant—height, for instance, without which vegetable life is sickly and feeble, is unfriendly to the germination of the seed. The disengagement of carbonic acid, and the absorption of oxygen, appear as a contradiction of one of those laws by which its after state is developed and sustained. How highly important, then, is it that agriculturists—that farmers, the business of whose lives lies almost exclusively in the elimination and nurture of vegetable life, should familiarize themselves with all those natural causes conducive to the results to which they professedly, but blindly, strive to attain? Yet how few care to inform themselves of the most ordinary and simple rudiments of their craft;—many believe that to hold a plough, to load a dungcart, or to perform the low offices of physical drudgery, is the highest qualification to which the professional farmer need aspire;—they care not to enquire for what reason they plough the land, or carry out the dung; enough for them, their fathers and grandfathers have done so, and have produced results without enquiry of the cause. It is to be hoped that this age of apathy and darkness is passing away, and that Agriculture, by the diffusion and aid of education and enlightenment, will assume its place among the most important and intellectual avocations of mankind.

The Seed, as has been stated, is a vital organization, whose vitality is suspended, or dormant, awaiting the combination which shall excite its vivification, this combination being a just proportion of heat, air, and moisture, applied;—chemical changes are effected, and physical organization is shortly produced;—in other words, the vitality is excited, the latent life becomes active, a radical or root is thrown downwards, from the incipient collett, while a stem shooting up and through the soil, the young life is seen putting forth its energies in the development of cotyledons, or, as they are commonly called, seed leaves;—and the newly-born plant is now supplied with those organs which most immediately minister to its sustentation and growth—the root and foliage—the mouth and lungs of vegetable organization. A new stage of existence is now arrived at, *germination,* which was aided and sustained by the saccharine juices formed by the transmutation of the compounds of the seed. It has progressed, so to speak, into *vegetation,* and organic functions are called into action to seek, in the soil and atmosphere, those gaseous and aqueous fluids which form the natural food of the plant,—such food as may be best adapted to its specific nature, and most proper for assimilation to its organic structure. These may be either organic, or inorganic,—Liebig appears to lean to the belief that inorganic matter (by which is meant such matter as has never before been the recipient of life) is the real, if not the only, nutritive agent of the vegetable structure, and thus, by the assimilation of rocks into vegetable life, do the very stones become bread,—and means are found, in what we consider the simple laws of nature, to convert substances, not otherwise applicable, into such as are well adapted to the nourishment and support of animal life.

Unquestionably this is a very beautiful phase of the benevolence of an Almighty Providence; one of the many silent and inscrutable operations which are daily and hourly wrought for our support and preservation. Respecting all, which we are certainly much too little inquisitive, as we are likewise much too little grateful.

For the present purpose, Roots with their fibres may be described, though not very correctly, as the mouths of plants and they stretch themselves out in all directions downward and laterally in the earth in search for food, and either by affinity or attraction, invariably tend toward that matter in the soil which is most congenial to the growth or development of the structure of the plant to which they belong; the nutritious fluid is absorbed by the spongioles or mouths at the extremity of the roots and fibres, and transmitted through them to the stem, the cellular and pipe-like structure of which passing it onward to the various branches and leaves, it is elaborated and woody fibre is formed by the disengagements and assimilation of carbon, while the freed oxygen passes off to the atmosphere in nearly pure gas. But besides carbon, the soil or the atmosphere must supply other nutritive substances, some as general agents in the vegetable structure, others as specific; of these may be noted Lime, Water, Flint, Phosphorus, Sulphur, Soda and others, these substances are rarely if ever in a simple state in cultivated soils, but are generally found

in combination with that matter for which they have a natural affinity.

To speak of the constituent parts of plants in a more methodical phraseology, it may be said that nine-tenths of the vegetable structure is composed of Carbon, Oxygen, Hydrogen, and Nitrogen, and these four elementary substances afford food for plants in the compounded forms of carbonic-acid, water and ammonia. Eighty to ninety per cent of the constituent parts of all vegetables is carbon and oxygen. Iron and silica (flint) are also absorbed and carried into the vegetable structure. Phosphorus and sulphur are also required to the full development of vegetable life, as are potash, soda, magnesia, &c. But though their presence is perhaps as indispensible as the more predominating constituents, their proportions are comparatively insignificant. It is hardly necessary to observe that all matter absorbed into the system of plants from the soil, must be in a state of solution. Lime is found to be a constituent in all those plants with which the farmer has to do. Clover and the cultivated grasses containing a very large proportion.

Now, as by her undeviating laws, nature performs no work of supererogation, it is but reasonable to infer, that all we find by research or analysis is requisite to the organic structure of the plant, without which its perfection would be retarded, the functions of its organs imperfectly performed, and a stunted and feeble development the result.

Having thus very briefly and imperfectly noticed the primary agents of germination, and the mode and sources of vegetable life, it may be well perhaps to consider, how by deduction, an enquiry of this nature may become of practical utility to the farmer. In order to aid us in this important consideration, most invaluable assistance will be found in the analyses and deductions of Grisenthwaite, Leibig, Madden, Johnston and others.

If careful analyses, repeated by skilful manipulations with similar results be worthy of credence, the constituent parts of plants, the elements of which their structure is built have in very many cases been pretty accurately ascertained. From these results the farmer learns that the grain of wheat contains 1-50 part, or about 2 lbs. in every 100 of its weight of mineral ingredients, as flint, lime, &c., which being in solution in the soil are taken up by the roots; that wheat straw has the same components in the proportion of eight or nine to the 100, and the records of analytical enquiry shew, that a good crop of wheat, say thirty to thirty-five bushels to the acre, will remove from the soil on which it grew, from 150 to 180 lbs. weight of flint alone. The smooth, shining and transparent appearance of the covering of the stem need be no subject of wonder when it is found the materials of which it is composed are exactly identical with these from which glass is manufactured. Wheat is essentially a flint crop—old-fashioned English farmers are accustomed to say they prefer to have "a few stones on the wheat ground;" ask them their reason and they tell you that from experience "they know wheat does best when there is some stones upon the land," and this simple answer affords a marked illustration of the utter ignorance in which one of the most important and universal operations of life—the manufacture of the great staple food of man has been and still is carried on—the actual stones form no part of the advantage derived, save that which is obtained from their imperceptible crumbling affected by the action of air, by the endless continuation of which process silica is rendered into impalpable powder capable of solution, and eventual absorption by the plant. So, in truth may it be said, that stones are useful to the wheat crop; but the wherefore, it is to be feared has scarcely been enquired about with that diligence, that so important a matter would in any other trade than that of the Agriculturist have long since commanded.

The stem or stalk of wheat is that portion of this plant which is most nearly allied to woody fibre, whose principle constituent is carbon and the aqueous fluids; it may not be irrelevant to notice in common with this assimilation of Carbon to woody fibre, that the familiar production of sweet sap from which such quantities of maple sugar is annually made, is formed, or generated somewhat in this wise: in the fall of the year starch is formed in the woody fibre of the tree, and remains unchanged during the dormant state of winter, but as soon as the aqueous fluids begin to ascend in Spring, they carry with them to the starch the diastath elements of its decomposition or rather its conversion, and the starch becomes sugar; to make this more clear, and to mark the beautiful simplicity with which Nature effects her operations, it should be borne in mind that the elements of sugar and Starch are identical, the simple difference being the arrangement of their proportions; that is to say—any given

quantity of either of these substances will contain exactly the same amount of the elements of its composition, namely, carbon, oxygen, and hydrogen, as is contained in the same quantity of the other gum is likewise identical in its composition, so that 100 lbs of sugar, starch or gum, will contain in round numbers about 50 lbs of oxygen, 44 lbs of carbon, 6 lbs of hydrogen; the wide differences in the characteristics of these compound substances as we daily meet with them makes this fact somewhat hard of belief, yet nevertheless such is the truth; such are the indispensible requisites; not only of the ingredients but of the same proportionate quantities; the great difference in the compounded substances being due solely to the atomic arrangement of the components. The nutritive property of wheat is perhaps in proportion to the amount of gluten it contains. And this substance partaking both of the nature of gum and sugar with azote, varies n quantity in almost all wheat, and very markedly in that of some countries. Professor Thompson in his "Organic Chemistry," states that an analysis of Odessa wheat yielded fourteen parts of gluten and eight parts of sugar, against ten parts of gluten and four of sugar in a French sample, and the aggregate of the gluten, sugar, and gum in the two analyses was in favor of the Odessa wheat, as twenty-seven to nineteen; and its consequent nutritous qualities as human food were in that proportion. Again, Johnston says, that "crop of wheat yielding thirty bushels per acre, weighing 1,800 lbs affords of nutritive matter 270 lbs. of huck or woody fibre—990 lbs. of starch, sugar, &c.—180 to 340 lbs. (a mean of 260) of gluten—36 to 72 lbs. of oil or fat—and 36 lbs. of saline matter."

From all which the deduction is marked, plain, and simple. Offer to nature the most ordinary facilities and the dormant germ is vivified; a fibrous and organic structure is to be fed and built up, and man is required only to furnish such rtion of the raw material as locality, or artificial causes have made deficient. If he places his flint plant where flint is absent, either naturally or by repeated draughts upon any originally short supply, he must remedy the error by artificial aid. If he desires his land should produce gluten, or rather an organization capable of assimilating the gaseous or aqueous fluids into that substance, it is no great stretch of intelligence for him to perceive the necessity to supply its elements. If his lime plant is to thrive, he will surely perceive that lime must be present in the in the soil. A very slight acquaintance with the organic constituents of his nitrogenous crop will shew the indispensibility of Ammonia. Simple however as are these deductions, yet are they not to be arrived at without the previous attainment of such an amount of analytical knowledge of the plant he desires to produce, as shall teach him the natural demands for its healthy organization and mature development. This must of necessity, be the starting point. And in this seemingly trifling yet highly important particular are farmers for the most part lamentably deficient. Its attainment is not only not sought, but actually spurned by many who are reputed good farmers—*good, because more fortunate than wise.* It is to be regretted that this apathy is so prevalent, and that so poor an argument in favor of ignorance, as its casual success, should be admitted as conclusive. There is no greater enemy to improvement in Agricultural science than your thorough going, old fashioned, self-sufficient farmer, whom you could as readily convince that he was his own plough-horse as persuade him that the smut on his wheat was a parasytical plant. The practical utility of our enquiry would seem to resolve itself into this:—That it is essential to the Farmer, that he should possess such knowledge of the physiology and wants of those plants which he desires to cultivate, in order to enable him to supply with some degree of intelligence, all those appliances which minister to their vigorous and healthy development; that he should know the land in which he sows his grain already contains the nutritive elements which the plant naturally seeks in the soil, and in default of its containing any or all of them, to supply understandingly, and not blindly, its mineral, mechanical or vegetable deficiency.

It is true that Farmers occasionally manure, as it is called, by carrying out the dung from their yards, and ploughing it into the land; but, to speak generally, *does the farmer of Upper* Canada know in what mode, by what process, by what chemical or mechanical operation the refuse of animal and vegetable life, is converted into the indispensable food of man; can he tell you in any connected and intelligible manner of the gradual and varied changes that necessarily take place; can he explain the conversion of rotted fish into vegetable organization, or shew the transmutation of the sea shell into the natural and nutritious food of plants; can he detail with the slightest approach to accuracy the causes of those undeviating results with which his every

day experience has rendered his eye familiar? And, why should an answer to these queries be a record of his ignorance? There is no other productive business, or manufacture, which is or can be carried on in so great ignorance with success; it is not reasonable to suppose then, that the success which such limited knowledge attains is only comparative, and that a better acquaintance with the fundamental principles of his calling would ensure much larger profits and more certain results.

A farmer need not be a Professor of Chemistry to learn that carbonic gas is assimilated into woody fibre, and becomes oak, or beech, or maple; that the straw of wheat is formed partly of flint—that the land he tills is decomposed rock, or vegetable or animal refuse; that vegetables feed or breathe, that each particular species has its idiosyncrasies,—its likes and dislikes. Why, he would never think of feeding his dog upon oats, or his horse upon flesh, yet he is hardly arrived at a similar distinction in feeding his crops. Special manures are rarely thought of, and the common and staple friend, the barn yard muck, frequently drawn out, and placed in small heaps in the field, often lies through weeks and months of a summer's sun evaporating all its most valuable properties.

Let us hope, Sir, that that widely spreading intelligence which is diffusing itself so rapidly over all the countries of the civilized world may, by its enlightening influence awaken us to a sense of our apathetical and culpable ignorance.

Let us hope, Sir, that an earnest and profitable enquiry may, by dispelling error and prejudice, bring to our minds a thorough conviction of the darkness through which, at present we grope our way to important but uncertain results.

GUELPH FARMERS' CLUB.

SUBJECT:—FALL AND SPRING PLOUGHING.

After an adjournment of some six months, "The Club" held their first meeting for the winter season, on the 8th Dec. Col. Saunders, President, in the chair. The attendance of members, was very respectable and considerable interest appeared to be manifested in the business of the evening. The subject for discussion was, "The relative advantages to be derived from Fall and Spring Ploughing," which was introduced by Mr. Geo. Murton, as follows:—

Mr. President and Gentlemen,—The subject for discussion this afternoon is,—The relative advantages to be derived from fall and spring ploughing. In introducing this question I fear I shall not be able to do it the justice it merits, and I also feel diffident in giving my opinion in the presence of men far my seniors both in years and experience in agricultural pursuits. However I will do the best I can to open the discussion and then leave it for abler men than myself to give us their views on the matter.

The benefits to be derived from fall ploughing in my opinion are many; one of which is, that by getting a portion of the land intended for spring crop ploughed in the fall, it enables us to get our seed in the ground much earlier than we otherwise could. By ploughing a good stiff furrow and then using a cultivator in the spring, I think we can get a much better crop than if we ploughed a second time in the spring. Another reason why I do not think it advisable to plough again is, that it leaves the land too loose and light to stand the drought of our hot summers. Again, by ploughing your land in the fall and then cultivating it in the spring, as before stated you will reap another great advantage, which is, that you will have fresh soil to act upon your crop: whereas when you plough twice you are exposing the surface employed the previous year. By using a cultivator you can dispense with one ploughing. Another advantage would be that you could plough much later in the fall and thereby give the cattle a longer run over the stubbles. The land that is intended for spring crop should have the ridges well rounded, and the furrows thoroughly cleaned out, so as to allow the water from the melting of the snow in the spring to get away at once, instead of letting it remain to soak into the soil. I consider there is as much need of keeping the furrows open on land that is ploughed in the fall for spring crop as there is on our fall wheat, for land that has been so saturated will not work as well as if it had been drained in this simple way. With regard to the proper time for fall ploughing, I dare say there are a great many different opinions; my own is that it should be done as soon after getting our fall wheat in as possible, especially for turnips, so as to give time for the grass to decompose before the hard frost sets in; if not, it will remain quite green all winter and then it will be altogether unfit to plough again in the spring, if the farmer were so inclined. A good proportion should be done before the time comes

for taking up potatoes and turnips, I find from my own experience that I get a very little done after.

We are all well aware that the action of the frost has a very beneficial effect on land that has been ploughed in the fall, especially stiff soils; it renders them much more pliable than they otherwise would be, and this alone should be sufficient inducement for all those farmers who occupy land that is the least inclined to be that way, to plough as much in the fall as possible. I am fully aware that what answers for one farm may not always benefit another, so that it would be folly to suppose that all farmers would adopt the same system; still, I think as a general thing, there cannot be much difference in opinion as to which is the best mode of preparing our land for crop,—fall or spring ploughing.

With regard to the advantages to be gained by spring ploughing, in my opinion they are few. There certainly is a part, and that the most laborious of a farmer's work, that can be done to advantage in the spring, which is, ploughing sod for summer fallow. You can mostly get to work a week sooner and sometimes more on a piece of sward than on any other part of the farm; and not only that, it ploughs a great deal easier than it would in the fall. I think it advisable also to plough in the spring rather than the fall for peas, if you intend putting them on sod, as the winter frost and spring rains wash all the edges off the furrows, and therefore you cannot bury the seed a sufficient depth. I have tried both ways, and must certainly give the preference to spring ploughing in this case.

I do not profess to be much of a barley grower, but from the little experience I have had I should say that it would be better to plough again in the spring; for this reason: if you plough your turnip land in the fall it will get packed so hard during the winter that I doubt whether a cultivator will break it up a sufficient depth, as that crop requires a fine tilth.

Mr. Wright had a few remarks to offer. The subject under consideration was one of great importance. Farmers in this part of the country occupied a great variety of soils, and the mode of cultivation must be altered to suit those variations. The land in this locality was chiefly a black loam; and when the subsoil was sufficiently open to drain itself, the advantages of fall ploughing must be apparent to every one; one reason of which was, that cattle were in better condition, and so better able to perform their work in the fall, than when put to it early in spring. Crops were more affected by spring ploughing than by fall. When this description of land was ploughed in spring, it suffered more from drought than if ploughed in the fall. Heavy sod, and especially land bearing twitch grass, should be ploughed as soon after taking in the fall crops as possible, that so it might have more time to decompose during the winter. A sod with a covering of clover should be allowed to remain as late in the season as possible, taking care that no cattle are turned in to eat it; but on no account should sod of this description be ploughed twice. On new land a different course should be adopted. It should be ploughed as soon as possible after the crop is removed, as by such means it would be ready for working earlier in spring, and so be *prepared for a good summer fallowing*. Fall ploughing was advantageous in another respect; patches of a weed called "Red Root" or "Pigeon Weed," prevailed to a certain extent. This was a fall weed, and it was desirable, where it prevailed, to plough it down in the fall.

Mr. Murton had tried both fall and spring ploughing for barley, and had found spring ploughing the best.

Mr. Caulfield said a man in his neighborhood had ploughed down a field of twitch-grass in the fall; but the rains caused it to spring up again; and in the following spring there was as good a crop of twitch grass as ever. He had tried the other plan; and although he only ploughed his land twice, he had a better and cleaner piece of fallow than his neighbor who had ploughed three times.

Mr. Wright thought that if ploughed down in spring the grass would not have time to decompose, and when the land was cross-ploughed, or broken up with the cultivator, the grass would turn up green on the surface.

Mr. Card thought rather extreme views had been taken on both sides. Mr. Wright had spoken of ploughing in September, Mr. Caulfield in June. With regard to the former, he thought it a rather strange time. He thought they ought to plough as early as possible after *fall* crop for *spring* crops, especially for turnips and potatoes. He had tried 9 acres of spring crop; 2 acres of which he had ploughed in the fall, 3 in the spring, and the remainder he had not ploughed at all. The part which he had ploughed in the fall, he passed over twice with the cultivator, what he had ploughed in spring, once, and the portion he

had not ploughed at all, three times; and the latter had yielded decidedly the best crop. This was a crop of spring wheat.

Mr. Mackie was in favor of ploughing either *early* in fall or *late* in spring. If they wished to kill weeds they must be ploughed down when in a state of active growth. During six months of the year, plants were in a dormant state; and thus if they ploughed *early* in spring, the plants would be turned under before they had begun to vegetate, and if *late* in the fall, they would have stopped growing, and, therefore, instead of being killed would only be prepared for a fresh growth in the following season.

Mr. Iles generally ploughed for spring crops as soon as his fall wheat was reaped; for potatoes and turnips late in the fall. For summer fallow, he preferred ploughing early in spring; he thought the plants would be decomposed sufficiently for another ploughing before haying time.

MEETING OF THE BOARD OF AGRICULTURE.

The Board of Agriculture held a meeting at their rooms on the 6th, 7th and 8th ultimo.

The following members were present: E. W. Thomson, Esquire, (President), Hon. Adam Fergusson, C. P. Treadwell, R. L. Denison, John Harland, Esqs., and Professor Buckland. The following is a brief abstract of the business done:—

A large number of communications were received and read, relating to matters of detail, and which, after receiving consideration were duly disposed of by the Board.

A communication was received form Mr. Evans, Secretary of the Lower Canada Board of Agriculture, stating that it had been decided to hold the next Provincial Exhibition of Lower Canada, at Sherbrooke, on the 12th, 13th and 14th September, 1855.

A communication was received form Mr. Sheriff Ruttan of Cobourg, stating that preliminary action had been taken in Cobourg, in relation to the exhibition to be held there next autumn, and proposing the following gentlemen to form the local committee, viz: Sheriff Ruttan, John Wade, Asa A. Burnham, Sir Edward Poore, George E. Castles, P. R. Wright, Alex. Alcorn, Walter Riddle, Ralph Wade, C. H. Morgan, H. Jones Ruttan, Thomas Scott, D. E. Boulton, Thomas Eyre and Francis Burnett, A. A. Burnham, to be Treasurer, and H. Jones Ruttan to be Secretary.

At a subsequent stage of the proceedings the recommendations embodied in this communication were adopted, and the Committee organized accordingly, with the exception of the name of Mr. William Weller being substituted for that of Mr. Sheriff Ruttan, who is ex-officio a member of the Local Committee.

Several communications were received in reference to the subject of offering encouragement for the importation of Stock; but the Board having already offered double the amount of premium for all animals imported since the exhibition previous to the one at which they shall take the first prize, declined taking any further action in the matter at present.

REPORTS, &c.

The Treasurer, R. L. Denison, Esq., brought up his report and balance sheet of the receipts and expenditure of the Association for their financial year of 1853-4 from which it appeared that the total amount received from Government for distribution to County Agricultural Societies and from the exhibition at Hamilton and the experimental Farm, was £11, 152 8 7., and the total disbursement, including distribution to Counties, expenditure on Experimental Farm, Prize, and expenses of the Exhibition and other expenses of the Board, was £10,391 0 10, leaving a balance in the Treasurer's hands previous to the Exhibition at London of £761 7 9.

The President brought up a report on behalf of a special Committee of the Board, appointed to award a prize of £20, offered by his Excellency Lord Elgin, for the first Drain Tile Machine which should be in successful operation to the satisfaction of the Board. The only competitors were Mr. J. H. Charnock, of Hamilton, and Mr. Bailey of Darlington. The prize was awarded to Mr. Bailey, on the ground that his machine was the first in efficient and practical operation, large numbers of the tiles made by him having been used for draining purposes, and some 20,000 of them having been used by Mr. Mundie, in the improvement of the grounds for the new Government buildings at Toronto. The Report was adopted, and the prize ordered to be paid Mr. Bailey.

A bill brought before Parliament by Mr. Felton, M. P. P., to amend the Act establishing the Bureau of Agriculture, having been referred to the Board, it appeared that one part of the bill

merely provided for the formation of County Agricultuial Societies in the same manner as the bill proposed to be amended, and which are already in operation in every county in Upper Canada ; the other part, and which would be the only alteration from the present Act, provided for the election of new members of the Board at the annual Provincial exhibition in autumn, instead of at the annual meetings of the county societies in the spring. The Board were of opinion that this alteration would not be of any benefit, but would be impossible to carry out satisfactorily at the autumn exhibitions.

The subject of the publication of the Transactions of the Board having been previously under consideration, it was again taken up. After some discussion, it was resolved to publish the transactions in the shape of a Quarterly Journal, similar to the Transactions of the Highland and Agricultural Society of Scotland, the first part of the said Journal to contain a succinct history of the Association from its first organization ; and copies of the Journal to be sent gratuitously to members of the Legislature, heads of Government Department, Agricultural Societies, newspaper offices, &c., the first number to come out on 1st March next. A special committee was then appointed to carry out the object of the above resolution.

The Hon. Adam Ferguson introduced a set of resolutions in reference to the registering of stock, as a substitute for a Herd Book, the difficulties in the way of getting up which it is believed are very great. The resolutions set forth that the opening of a stock Register by the Board, for thorough-bred stock, whether horses or cattle, would be a great aid and encouragement to the spirited and enterprising breeders of the country ; that any person desirous of availing himself of such a register could do so, on certain terms, but that no animal should be registered unless the descent of the same shall be traceable to the British or American Herd Book. After some discussion these resolutions were adopted.

Hon. Adam Fergusson then brought forward another set of Resolutions to the following effect: —That the establishmens, of a Veterinary School, organized upon scientific principles, would prove of essential importance to the Agricultural interests of this Province ; that such an institution well deserves the patronage and support of this Board ; that a Veterinary Lectureship, Anatomical School and Museum, Hospital and Forge, would find a good location in Toronto, and may with case and much mutual advantage, be connected with the Agricultural chair in University College ; that a Committee be appointed to call the attention of the Bureau of Agriculture to the subject, and respectfully to offer suggestions towards its establishment with as little delay as possible ; and that the above Committee shall report progress from time to time to the Board, and use every means in their power to carry the measure into effect. These resolutions were also adopted, and Mr. Ferguson was authorised, as Chairman of the Special Committee appointed, to correspond with the Government upon the subject.

The time to be appointed for holding the next Provincial Exhibition at Cobourg, was then discussed, and it was finally decided to have it take place on the Second Tuesday in October next.

A Resolution was then proposed and carried, conveying the thanks of the Board to Professor Hind, for a collection of specimens of 30 or 40 different varieties of Wheat, presented by him to the Board.

At this stage of the proceedings, Mr. Henry Cowing applied for permission to explain diagrams of a machine invented by him, and which he calls a " locomotive steam plough,and machine of all work." After listening to Mr. Cowing's explanations, the Board adopted a Resolution recommending the invention to the notice of the Bureau of Agriculture, and suggesting that Mr. Cowing should receive some assistance towards getting up a model, with the view of exhibiting it at the Paris World's Fair.

The question as to which Counties Prize Agricultural Reports, should be received from in 1855 was then considered, and it was agreed to ballot severally for one of the Western, one of the Central, and one of the Eastern Counties of the province, excluding those for which Prizes have alreay been awarded. This being done, the choice fell upon the Counties of Bruce, Simcoe and Prescott, which are accordingly eligible for Prize Reports in 1855.

Several alterations were then proposed and adopted, as to the mode of taking entries for competition at future exhibitions, the principal one being that application for entries shall be made upon printed forms furnished by the Board, such forms to be returned to the Secretary's office two weeks at least before the Exhibition should take place.

By a Report from the Secretary it appeared that the members who retire from the Board this year, according to provisions of the Act, but who, however, are ellgible for re-election, are the hon.

Adam Ferguson, David Christie and J. B. Marks, The Secretary was authorized to direct a circular to County Societies, calling their attention to this and other duties at their annual meetings in February next.

A number of other matters of minor importance were next brought up and disposed of, and the Board adjourned on Friday afternoon till further notice.

PROFESSOR BUCKLAND'S REPORT.

E. W. Thompson, Esq., *President of the Board of Agriculture:*

Dear Sir,—In consequence of my personal attendance having been required on the grounds now in course of preparation for Agricultural Experiments, I have been able to visit only a few Agricultural Societies, in accordance with a resolution passed at a former meeting of the Board.

On my return from the Provincial Exhibition the beginning of October, I embraced the opportunity of being present at the Annual Show of the Agricultural Society of the County of Oxford, held at Woodstock. Considering the inauspiciousness of the weather,—the rain coming down in torrents,—the Show, as a whole, was much better than I had anticipated. Much of the Live Stock was of good quality;—of the pure breeds there were several very creditable specimens, as was also the case with Sheep and Swine. I was highly gratified with the display of grain and roots, which were quite superior to what might have been expected, considering the late unfavorable season. I should judge that many of the farmers, both in this and the adjacent county of Middlesex, are fully cognizant of the intimate and important connection subsisting between liberal feeding and the permanent improvement of live stock. I observed, in both these counties, patches of turnips, mangel-wurtzel, carrots, &c., varying in extent from one to three or four acres, on many farms; and, in some instances, I was informed that root culture was much more extensively practised. Travelling through these counties six years since, I observed but few green crops; and the improvements which have been since effected in agriculture, roadmaking, &c., are of a very obvious and extensive description. In the evening, a large party sat down to dinner, and the sentiments enunciated by the active and indefatigable President, Geo. Alexandor, Esq., and others, were of a hopeful and most encouraging kind. From all I could see and learn, I feel quite confident that the Board may safely reckon on the co-operation of the farmers of Oxford in carrying out the great objects of agricultural improvement.

In about a week after my return home, I paid a hurried visit to Brockville, Kingston, Picton, Belleville, &c. The Annual Show of the Leeds and Grenville Society was held at Brockville; and although not very extensive, yet the quality of the live stock and other articles exhibited, indicated careful attention on the part of their owners, and the capabilities of this beautiful and productive section of country. The butter and cheese were of excellent quality: indeed much of this portion of the Province, having a close, calcareous soil, is admirably adapted to dairying purposes. After the close of the Exhibition, I addressed a pretty numerous audience, principally farmers, in the Court House, on some of the more obvious points of improved husbandry, and the means of imparting fresh life to Societies, the promotion of farmers' clubs, &c. It was gratifying to find a strong desire expressed for agricultural improvement generally, and particularly for improved stock, in which the eastern section of the Province appears more deficient than either the central or the western.

I had some pleasing intercourse with several of the more enterprising farmers and merchants of the county of Leeds; and although I cannot in this brief report mention the names of individuals, I must not wholly pass over that of our esteemed friend, Wm. Matthie, Esq., whom I found in the possession of restored health, and as active and zealous as ever in advancing the best interests of the country. Considerable improvements have been effected in the picturesque and flourishing town of Brockville since I was last there, during the Provincial Exhibition in 1851; its commerce is fast increasing, and several of the stores are not to be excelled, whether as regards extent or appearance, by towns of much greater population.

I was under the necessity of hurrying away from Brockville, to attend the Prince Edward County Show at Picton, the next day. Owing to the delay of steamboats, I was not able to reach Picton till the evening, when the Show was over. I had an opportunity of conversing, however, with a considerable number of farmers, and I soon learnt that the Exhibition had been better attended, and was of a superior character to its predecessors, for several years.

On my way up the bay, I observed some pure-bred cattle, sheep and pigs, put on board, the property of Mr. Boyce, of Amherst Island, who was taking them over the water to Bath, to the Show of the County of Addington Society. Mr. Boyce's animals were highly creditable to him, and evidently indicated progress in this, perhaps the most important, department of rural economy. I had some conversation with a few members of the Addington Society, who expressed themselves anxious about the best practicable means of importing and diffusing the improved breeds of cattle.

I had also conversation with Messrs. Ferguson, Cameron, and other enterprising agriculturists of Kingston, upon these questions, all of whom feel a warm interest in extending the benefits of an improved agriculture. They thought that the efficient sustentation of the Provincial Association afforded one of the best means for promoting such objects, and that the holding of the Exhibitions on an equitable principle in the different eligible sections of the Province, would be essential to the continued success of that important organization.

From Picton I proceeded next day to Belleville, to attend the Exhibition of the County of Hastings Society. The weather was unfavorable, but I was delighted to see so large a collection of both articles and people. There was an earnestness and activity about the people which it was peculiarly pleasing to observe. In live stock there were some good specimens, and much of their grain and roots was excellent; some samples of peas, barley and oats, being particularly fine. The Town Hall was filled to overflowing with spectators, and the Ladies' work was both extensive and of superior execution. I have seen nowhere, I think, so much interest taken in these shows by ladies as in the county of Hastings. I addressed the people for a short time in the Town Hall, and felt much satisfied with what I saw and heard. Our friend, B. F. Davy, Esq., the President of the Society, continues as active and zealous as ever. The town of Belleville is rapidly advancing; and throughout this fine section of country, there are unmistakable marks of healthy progress.

I afterwards attended the Township of Hollowell Show, at Bloomfield, in the county of Prince Edward. Again the weather was wet; notwithstanding, the attendance was pretty numerous, and quite a respectable collection of good articles was got together. I noticed some hops, which, in point of quality and curing, would compare favorably with the same production in the old country. Hop culture is increasing in this county, and, when properly conducted, it is said, pays well. The people in Prince Edward seem, upon the whole, very well to do; the county is small, and thickly settled. I gave an address, particularly referring to the important question of importing the breeds of cattle, which led to a long discussion. I observed but few root crops in this county, a matter which the farmers would do well to consider, particularly in its relation to the improvement of stock. From my intercourse with the people both in this and the adjoining county of Hastings, I am led to the conclusion, that the Board may reckon on their co-operation in promoting objects of agricultural improvement.

In the hope of having more time hereafter to give to this interesting and important department of duty,

I have the honor to be, dear Sir,
Your obedient servant,
GEO. BUCKLAND.

December 1, 1854.

NEW STEAM DRAINING PLOUGH.

From the Mark Lane Express.

Some experiments of a deeply interesting and important nature, in connection with the question of land drainage, were lately made at Catherine-farm, on the estate of P. W. S. Miles, Esq., at Kingsweston England, when Fowler and Fry's new steam draining plough was for the first time put in operation. The great utility of underground drainage upon clay soils and in marshy districts is now too generally known and appreciated to leave it matter of debate; but the heavy expense which the adoption of the system of hand labour entails, especially in neighbourhoods where that labour is scarce and dear, has hitherto stood in the way of its general adoption. It will be obvious that anything which has a tendency to facilitate the operation and diminish its cost, must be, in an eminent degree, beneficial to agriculture; and hence scientific and practical men have been stimulated to bend their efforts in a direction tending to those ends. The drainage of moist lands was first attempted by the simple process of digging by spade labour narrow trenches, and laying rude stone drains in the bottom of them. The difficulty of procuring stones and the cost of hauling them, were found

to stand considerably in the way of that process, and the use of draining tiles in various forms was by degrees introduced, but without any decided improvement being effected in the mode of cutting the drain trenches. An important revolution in the process was introduced by Mr. Fowler, of Bristol, agricultural machine manufacturer, in the invention of his draining plough, by which manual labour was in a large degree superseded; but a deficiency still remained. The plough had to be worked by horse power, four horses being employed by it in turning the windlass by which it was set in motion, and the process, although cheaper and more expeditious than spade labour, was, nevertheless, in a degree expensive and tardy. The desirability of applying steam power to a plough upon the same principle soon became apparent, and, impressed with the importance of the object, Mr. Fowler directed his attention to it, and now, as the result of a great deal of anxiety and labour, and of no inconsiderable expense, he has perfected a steam draining plough, which we recently saw in successful operation, and which we have no doubt will speedily take rank among the most useful inventions of the day. A brief description of the machinery may prove interesting.

The steam engine, although mounted on wheels, and capable of being transported from point to point, is when employed, a stationary one, and worked by a horizontal cylinder. It has connected with it two drums, which are loose on the axles. Attached to the larger drum, which draws the plough forward, is a wire rope of beautiful manufacture, the breaking strain of which is 14 tons, the working-strain being 5 tons. This drum is worked by two motions of the fly-wheel shaft, which give a leverage of 22 to 1 on the plough, the drum making 7 revolutions per minute. To the lesser drum, which is worked off the second shaft, is attached a rope, also of wire, but of smaller calibre, which draws the plough back, when it has completed a furrow, to the side of the field from which it started and were it has to begin again. By an ingenious contrivance the drums are formed by the insides of two spur-wheels, so that practically the working is effected by ordinary spur gearing. The drums can be instantly thrown out of gear by clutches moving the pinions on a feather. The larger wire-rope, on being wound on to the drum for the purpose of impelling the plough forward, works round a sheave-wheel or pulley-block anchored to the field at such a point as to draw the plough at right angles to the engine, by which arrangement the necessity of shifting the engine is obviated to so great an extent that almost any field may be drained without once removing it from the position first taken up by it. To the front of the plough is attached a second sheave-wheel, round which the rope is doubled, thereby also doubling the power. The coulter of the plough is of iron an inch in diameter at its widest point, so that the furrow made by it upon the surface of the land is scarcely perceptible and generally disappears after the first storm of rain. It can be worked to a depth of four feet, and indeed deeper if necessary, and is so made that it can be raised or depressed by a hand-wheel under the control of the ploughman, and which works gear connected with a rack at the back of the coulter. The boring of the land is effected by means of a cast-iron mole or plug (the size of which is regulated by the size of the tiles to be laid) keyed to the bottom of the coulter, and the most striking feature of the machine is, that as fast as it bores the land it lays in the tile-piping, thus completing the drain as it goes, at the rate (when we saw it working) of 35 feet, and probably, under very favourable circumstances, 40 feet per minute. It should be stated, in order to the understanding of what follows, that as the engine winds the large rope on to the large drum, and draws the plough towards it, it at the same time unwinds the small rope which is attached to the back of the plough from the small drum.

The mode of operation we will now endeavour to explain, assuming for our illustration a field 1000 feet square, which has to be drained by drains 10 yards apart from east to west. The engine would be fixed at the middle of the western edge; the plough would be placed on the eastern edge at ten yards from the southern edge of the ground, and an anchor and sheave-wheel would be rigged exactly opposite to it on the western side. The large wire rope would be passed round the sheave-wheel, and thence on to the front of the plough, while the small wire rope would be connected from the back of the plough with another anchor, &c., rigged ten yards north of the plough—that is, at the point to which it would have to be drawn back, and from which it would have to commence again. The machinery thus arranged, the pipe tiles are strung on ropes of fifty yards long (the length being thus limited to economise time and labour in threading), but fitted with ingeniously contrived joints at either end, so that they can be readily and firmly joined together to any length required. These ropes are made of hemp for the sake of flexibility, while, as a matter of economy and durability, and to decrease friction as much as possible, they are coated with wire. The ropes being threaded and joined, one end is fixed immediately behind the mole, and the machine being set in motion by the steam engine, the coulter cuts its narrow channel through the land, the mole bores and lifts the subsoil, and the pipes are drawn throught the aperture, and closely and neatly put together, forminig the drain. The sheave-wheels are then shifted, the plough drawn back by the small rope, and the second and succeeding drains are cut and piped in the same way. The ropes, after the tiles have been laid, are drawn out by horses, which is the only employment of horses labour required. The plough is attended by a man, whose only duty seems to be to keep it upright where the land is out of

level; but Mr. Fowler has perfected some self-acting level guides which would be shortly attached, and which would enable the plough to adapt itself to any inequalities which might arise, and make it independent of any guide.

The advantages which Mr. Fowler expects to derive from his inventious are manifold. The first and most important is, of course, economy. The sum at present charged by contractors for draining on a large scale per acre, is from £5 to £6. A considerable tract of land at present in the course of drainage in an adjacent county, is understood to have heen taken at £5. 5s, or £5. 10s. per acre. Mr. Fowler considers that, by his machinery, land may be drained for from £3. 10s. to £4 per acre, yielding a fair remuneration to the contractor. One engine with ten men and two horses will, he calculates, do as much work as 120 men, and, under favourable circumstances, as much work as 150 men would do by the old spstem. With regard to the capabilities of his invention, Mr. Fowler calcu'ates that with a single engine and plough he shall be able to drain about 30 acres per week.

STEAM PLOUGHS.

The great motive power of steam has been less applied with success to the cultivation of the soil than to any other object in which motion is desirable. Old mother earth presents stubborn obstacles to a power working always in the same uniform but unintelligent manner. Steam and its machine children cannot adapt themselves to the undulating surface, nor can the motive power, in the state in which it has yet been applied, be guided through the land without its cumbrous body interposing a ponderous resistance which no known degree of force can overcome with the observance of economy. We present here the following summary of the history of the steam plough from the *Agricultural Gazette.*

"The first steam plough was set to work in 1836, and since that time several ingenious individuals have constructed machines upon much the same principle—employing an engine to drag sets of ploughs to and fro by coiling ropes or chains round drums and pulleys. The latest is a design, provisionally patented in November, 1852, n which a wire rope is to be wound up, having ploughs, harrows, &c., attached. Probably the most successful is Lord Willoughby's, which has been at work in Lincolnshire. As steam has effectually delivered our horses from the round of the thrashing machine, it may be a laudable endeavour to displace them from the ploughs; still we would rather direct the aim of inventors to some more complete and efficient operation than mere ploughing. The *spade* being a better tool than a plough as regards the quality of its work, some persons, have tried to imitate its movements by mechanism. In the Great Exhibition was seen a large frame on wheels, carrying a number of spades to be worked up and down and oscillated by means of cranks upon a rotating shaft turned by an engine, while the soil thrown off from these spades was to be caught and turned over by a series of scuppets. There was also a model in which a frame of spades or forks was thrust simultaneously into the ground, vibrated so as to loosen the solid earth, and raised and turned half round so as to invert and deliver the loosened spadefuls. Both these machines were reviewed in the reports of the Exhibition, published in the *Agricultural Gazette* in 1851. In the year 1847, Mr. Barrat, of Paris, patented another form of machine for imitating manual digging. It consisted of a locomotive engine working behind it a series of *mattocks*, each somewhat similar in shape to a carpenter's adze, only having a couple of prongs instead of a broad blade. By proper apparatus, in connection with strong springs, these heavy mattocks were struck into the ground; then, by a sliding movements of the bar upon which they hung, they were drawn a short distance, backward, to turn over the detached pieces of soil. Meanwhile, the engine msintained a slow uniform rate of progress over the solid land in advance of the tillers. The latest invention for actuating spades by steam power is that of Mr. Bauer, patent in November, 1853. And besides these schemes, there have been others for manipulating spades by mechanism put in motion by the mere *traction* of the machine; as, for instance, two inventions provisionally patented in 1853, and another fully patented in September of the same year, in which some broad blades are made to delve, lift, and invert the soil, by means of horse-power applied to draw the implement along."

STEAM POWER SUPERSEDED—NEW INVENTION.

Many discoveries and inventions of immense importance to the world have been tested within the last ten years, and found to answer all reasonable expectations. Many others that were to "supersede" those now in use, especially the steam engine, have been introduced to the public with much confidence by their inventors, but soon ceased to attract notice, and are now forgotten. Whether we have at last discovered a new mechanical power destined to drive the steam engine, with all its triumphs and disasters, out of use, may well be doubted. The following description of a new invention, called "Poulson's patent pendulum T lever," is from Herapath's London *Railway Journal*:—

STEAM POWER SUPERSEDED.—Improbable as the announcement contained in this heading may seem to many or most, the fact still stands—steam, as a motive power, is at length about to be wholly superseded. The important invention to which we allude is destined to create a revolution as sudden, complete and wonderful, as that occasioned by the introduction of the power which it will supplant. For, strange to say, the immense saving accomplished by the new method of propulsion, not to mention its other advantages—and they may be many— will make it imperative upon all now employing a steam power, whether in propelling a railway engine, a steam vessel, the spindles of a factory, a saw-mill, or for any of the thousand and one other purposes to which it is at present applied, one and all at once to blow out their fires and adopt the new system. There is not a word here but is written in all sober seriousness, startling as the intelligence may be. The invention has already been pateated, under the name of "Poulson's patent pendulum T lever," and within a month from the date at which this is written it will be brought fully before the public; hence it is unnecessary at present to enter upon any explanation of its mode of action. Suffice it to say that two men in a sitting position will be able with ease to propel a railway engine of 25 horse power, with its full complement of carriages, at any speed to be attained by steam power! The tenders and boilers of the present engines will be no longer required, and the new engine will be constructed of about one-fourth the weight, and of, say, one-sixth or one-eighth the cost. The wheels and frames of the present engines will be available for the new ones. The saving that will be effected on railways, by decreased weight and cost of engines, the sweeping away altogether of both weight and cost of tenders, coke and water, will, we need not say, be immense, and to these advantages will be added, in its application to sea-going vessels, the great saving of space now occupied by the coal, and thus enhancing the carrying capabilities of those vessels to a remarkable extent. Henceforth, no fears will be entertained in setting out on a voyage round the world, of being caught in the midst of a western ocean, without the means of making headway, by a failure in the supply of coal, or of having to traverse the ocean 1,000 miles out of the desired course to obtain the necessary addition to the store of this now indispensable article. With the exit of steam, moreover, we shall have an end of the disasters, through the bursting of boilers—no inconsiderable point in itself—in the list of the advantages of the new movement. We must also add that the principle will be applied at once to ships' pumps, and with the most beneficial results; four men will be able to pump the largest vessel dry, and with so much ease to themselves as to continue their labors for six or eight hours consecutively, whereas at present 30 men are occasionally put in requisition for the same thing, and only capable of working half an hour at a time by the utmost stretch of their power.

Communications.

REPORT ON THE PRESENT STATE OF BRITISH AGRICULTURE,

BY WILLIAM HUTTON, ESQ.,
Secretary of the Board of Statistics, Quebec.

[We are compelled, for want of space, to break up Mr. Hutton's very valuable communication into parts, so that the subject will be continued in consecutive numbers.—ED.]

Having lately had an opportunity of witnessing some material improvements that have taken place in several of the agricultural districts of Great Britain—of hearing discussions upon the favorite agricultural topics of the present improving age—it may not be uninteresting to allude to a few of the subjects that are at present engaging public attention, with the hope that the farmers of Canada—if they cannot closely follow the example of their cotemporaries in the old country—may at least know what channel their thoughts are taking, and what course they intend to pursue in these, to them, extraordinary times, —extraordinary because of the very high prices of agricultural produce of every kind—grain—meat—flax—seeds, &c.,—extraordinary too from the extreme wetness and coldness of the latter seasons, rendering it extremely difficult to cultivate the land to advantage,—extraordinary also from the great mortality amongst cattle, many extensive farmers having lost nearly their whole stock,—and also from the remarkable fact, that although prices are ruling so high, there is a very great decline in the importation of foreign stock from Holland and other quarters, thus promising very high prices for some time to come for home-fed beef and mutton, as well as for grain. Not for many years has this great truth been so apparent to the agriculturists, "that they are much more interested in having *good crops* than *high prices.*" The occupiers of land throughout Great Britain, except in a few dry localities, have found their money returns for last year's wheat very much smaller than they would have received for *good crops* at *moderate* prices. Prices are nothing to the farmers who have nothing to sell. The remedies for these evils, which almost all over Great Britain and Ireland the farmers appeared to be adopting, were, 1st. Tile draining to an immense extent—the tiles were round—about 15 inches long, and having a bore of about 2½ inches. The drains are sunk with a gradual slope till they are as narrow as possible

in the bottom, and made 2, 3 or 4 feet deep, and ten or twenty yards apart, according to the fall and requirements of the soil; then the tiles are laid, touching one another in the bottom, and covered with a little straw before the mould is put in. The water filters through at the joints, and even through the tiles themselves, they being made of a very porous nature. I saw miles of these drains in operation, and emitting considerable streams of water. The improvement to the crops, in very many situations, in a damp season, was fully fifty per cent., and in many fields where there was an abundance of surface fall, and where an unpractised eye would suppose there was no necessity whatever for drainage, the farmers assured me their crops would be twenty per cent. better for tile draining.

The expense of draining wet, spongy land, in this way, is very considerable, being about six to ten pounds sterling per acre. It is often done by the landlord, who charges the interest of the cost in addition to the rent; but in general the landlord furnishes the tiles, and the farmer the labor. I saw some of these drains in perfect working order that had been made ten years, and I saw one instance where the farmer was making these drains at his own cost, although he stood at a rent of 40s. sterling per acre per annum—the landlord having refused to furnish either tiles or labor. This draining and also ploughing the land in well-rounded, narrow ridges, were the principal means taken to obviate the extreme wet and cold which have for some seasons been so much felt in Great Britain.

That this tile draining is practicable, and would be useful in Canada, even with our dry climate, can scarcely be doubted; at all events, in many localities, and in a ratio corresponding to the demands of our climate and soil. There are very many situations where a reasonable outlay would pay excellent interest, especially so long as prices continue as remunerating as they are at present. I am induced to insert here the observations of one of the best practical farmers in England, addressing his tenants upon a late occasion:—"Believe me," said he, "there is no greater truth than that expressed in the old adage—'If good management won't pay, bad cannot.' In the first place, then, begin with draining your land, when necessary, of superfluous water, or I fear you will soon have to complain of having drained yourselves of your superfluous cash. Secondly: As far as in your power, never suffer the soil to produce anything but what you put into it, remembering that 'ill weeds grow apace,' and that there is no crop so ruinous to cultivate, so disgraceful to possess, and so expensive to eradicate. Thirdly: Endeavor to keep your farms in such a state of high cultivation that you may be enabled to take your crops *off* the land, instead of *out of* it, that is, *never overcrop;* for you may rest assured that that most unprovident habit of overcropping, or in any way detracting from the productive quality of the soil, will, in the long run, prove extremely detrimental; and, finally, never hamper yourselves with more land than you have ample capital to manage—the probable result of which would be, that your farms, instead of being a comfort and a profit to you, will hang like a millstone about your neck, and, by continuing in such a hopeless speculation, you will rob yourselves of your last shilling." All this advice is extremely applicable to us Canadian farmers, who are very much addicted to the habit of cultivating more land than we are able to do well or successfully, and, in too many instances, are too fond of overcropping, underfeeding and undercleaning our land, and not fond enough of underdraining it.

Another evil, which I have alluded to, is the great scarcity of Cattle, which has arisen in the North of Ireland, and in many parts of England, from a fatal disease, which appears to baffle all skill to arrest. To remedy the evil arising from this loss, and also to take advantage of the very high price of beef and mutton—I observed some very important and very successful exertions having that tendency. The first was to grow a greatly-increased breadth of turnips and marigold, by aid of bone dust and guano, in addition to their farmyard manure. With these they fed the surviving young stock very abundantly—forcing them forward at a very early age; on many occasions I saw cattle two years old past in the stalls, which made excellent beef, and were sold as high as from £12 to £16 sterling each for slaughter. These animals were chiefly Durhams, or crosses from Durhams, though there were many of other breeds; but the Durhams appeared to be the best for forcing, and were generally declared to be so. From a few weeks old, they were fed with broth, made of linseed, which the farmers in many localities collected from their own flax crops. For many years the flaxseed had been allowed to be lost, the farmers not taking the trouble to gather it or allow it to ripen, from an idea that the ripening of the seed,

so as to be available either for sowing or food for cattle, was injurious to the quality of the fibre of the flax itself; but in this respect a wonderful change has occurred; very few farmers now allow it to be lost; on the contrary, it is found that the seed adds fully one-eighth to the value of the flax crop. I saw many splendid calves that had not tasted milk from being six weeks old; having been actually fattened and forced forward, almost beyond comprehension, by this nutritious food, to a certain age, when the greatly-increased supply of turnips and marigold kept up the growth thus auspiciously begun, and (like money making money) created such an increased supply of the richest possible manure, that many farmers have been enabled to add very largely to the breadth and quality of wheat cultivated.

The *Mark Lane Express*, for April last, in its Agricultural Report, contains the following remarkable fact:—"The quantity of land under wheat culture this season is by far the largest ever recollected. Almost every district in England (and it might have added in very many parts of Ireland) has an excess over last season by at least one-third; hence, should the crop prove abundant, we may look forward to an immense aggregate return."

It is worthy of note in passing that this great increase in the cultivation of wheat, has not taken place without an increase in the growth of green crops, to ensure a fresh supply of that particular kind of nourishment to the soil required for the growth of wheat; the extra supply of manure for these green crops was first supplied by means of Guano and bone-dust, and other profitable manures, the use of which is rapidly extending. A late London Economist thus remarks—"A constantly increasing interest in the supply of guano is being manifested by Agriculturists—the vast benefits they derive from the extensive use of portable manures becoming every day more widely appreciated. Apart from the difficulty of making sufficient yard manure on a farm at reasonable cost, the time occupied in carrying it out and ploughing it into the land is great, while the wear and tear of horses, carts, and tackle is very considerable; but the great advantage of portable manures is, that the use of them gives such an impulse to the growth of green and root crops on a farm that the home-made manure is wonderfully increased as well as the produce of grain." There is a new kind of light manure, directions for the application of which are given in the North British *Agriculturist*. It is nitrate of soda, a rough kind of soluble saltpetre, and as these directions which are very simple may be of some practical value in Canada—if not now a few years hence—I extract them:—"Nitrate of Soda used as a top-dressing to glass and clover, ought to be applied when the land is rather dry but when rain is expected, as it requires to be washed into the ground. The Nitrate should be applied at two different times, at least in about equal proportions, generally about a month intervening; the first application in March (in this country April) if weather be suitable. If the grass is intended for soiling a double quantity (viz., two cwt.) may be applied with or without an equal weight of guano. As to cereal crops, wheat, barley, oats, &c., these should be four inches in height of blade before the first application. To prevent lodging of the crops, one cwt. of nitrate of Soda and two cwt. of common salt will generally be found the most profitable quantity; one half to be applied at each time, viz., 56 lbs. of nitrate of soda and one cwt. of common salt. To assist in its more equal distribution, saw-dust may be mixed with it. Common salt may be used in a larger proportion, say three or four cwt, but, in this case grass seeds should not be sown as the salt will destroy a portion of the clover seed.

When the grass is intended for hay an equal money value of guano, viz., two cwt. along with one cwt. of the nitrate will be usually more profitable than the application of two cwt. of nitrate alone. The editor adds, "five times the usual quantity of nitrate of soda is likely to be used in Scotland this season from the attention recently drawn to its fertilizing power; orders have been given for 500 tons. In many well authenticated experiments the increase of from six to ten bushels of wheat per acre has been obtained from top dressings of nitrate of soda. The price is quoted in the *Economist* at 14s. to 19s. stg. per cwt. The *North British Agriculturist* to this valuable information further adds, "We need scarcely say that in recommending the more extended use of light or portable manures, we do not suggest any diminution of efforts to make the largest possible quantity of yard manure, or to feed as many sheep as possible on the land, for these are the bases of Agricultural success. But as *additions* to the manure produced on the farms to increase the breadth of green and root crops, and to bring the land up to that high standard of fertility at which the growth of large crops in all or nearly all seasons, becomes comparatively

easy, the use of artificial manures is much to be encouraged. For *cereal* crops *nitrogenous* manures are to be used—for *roots, mineral* mineral manures will be found highly beneficial; the first enquiry of the farmer purchasing must be as to the constituents of the crops he proposes to grow, and the requirements of his particular soil. Professor Way gives the following as the mineral matters in a crop of turnips of twenty tons including the tops, in Phospheric Acid 38; Sulphuric Acid 50; Lime 75; Magnesia 12; Potash and Soda 144 Common Salt 58. As the most essential constituents of the Turnip "are phospheric acid, phosphate of lime, potash, soda, and nitrogen," to supply these should be studied in preparing turnip manures. The first two and last exist in guano and also in bones; potash and soda generally exist in the soil, the latter conveyed by rain water as is also nitrogen—but it is found always profitable to supply it in the manure The most essential condition of manures is the proper degree of *solubility.* In the turnip it is particularly essential that the plant should be pushed at the early stage of its growth by the manure being *soluble* while during the growth in summer, part of the manure should slowly become soluble so as to prevent waste. Peruvian guano alone at the rate of five cwt. per imperial acre is found an excellent manurial dressing for Sweedish and other turnips. In applying to cwts there is conveyed to the soil of ammonia 89 lbs., of phosphate 155 lbs., of phospheric acid 19 lbs. *Turnips grown with Peruvian Guano frequently become prematurely ripe—those grown with bones on the other hand not only grow on up to the end of autumn, but the frost stops their development.*

The following dressing for Swedish Turnips in addition to yard manure, applied in the Autumn has been found successful:—

2 cwt. of Dissolved Bones at 7s. per cwt.		14	0
2 cwt. of Rape Dust at 6s. 6d.	"	13	0
1 cwt. of Suiphate of Soda, 4s.	"	4	0
2 cwt. of Common Salt at 1s. 6d.	"	3	0
28 lbs. of Nitrate of Soda, 5s. - - - - -		5	0
	£1	19	0

This for a clay loam—but for a light sandy or gravelly soil, eight bushels of ground bones should be added. Whereas farm-yard manure has been applied, one cwt. of Peruvian or two cwt. of other guano should be added, or the rape dust increased by three cwt. or 56 lbs. of nitrate of soda applied. These applications will produce a very full crop, the *variety* of substances acting more powerfully than the same money value of any of them *separately.*"

(To be Continued.)

ON DRAINING LAND.

To the Editor of the Agriculturist.

L'Original Dec. 18th, 1854.

Sir.—I herewith enclose you an article on draining, with which I have been kindly favored by J. B. Marks, Esq., of Barriefield, near Kingston, and which he has consented to have published. As I think the practice of subsoil draining is that by which the agriculture of Canada can be more advanced than by any other that can be adopted at this time, I beg that you will please insert it in your next issue.

I am, sir, your most obedient servant,
CHARLES P. TREADWELL.
President of the A. A. of U. C.

My Dear Sir,—Agreeably to your request I send you my views on draining.

J. B. MARKS.

Barriefield, Sept. 22nd, 1852.

The following remarks respecting the growth of clover, wheat and Indian corn, and draining of land, are so intimately connected with the improvement of the country, that no farmer posessing common intelligence will overlook their importance:—

The red clover is of immense importance to the improved system of American husbandry, taking the place of almost every other kind of ameliorating crops, its tap roots penetrate and loosen the soil, whilst the leaves and stems produce abundance of nutritious food for the farm stock, and both roots and stems, when turned under by the plough, are extremely enriching to the soil.

The clover grown annually in the United States of America is estimated at one million five hundred thousand bushels, worth more to the growers than five times that number of dollars, and it is desirable that our farmers should immediately go into this profitable branch of husbandry.

Besides, green clover is frequently turned under in the fall, to enrich the ground preparatory to a crop of wheat, or in the ensuing spring for the benefit of Indian corn: but to produce abundance of clover, wheat or Indian corn, the land must be thorougly drained. This well done, no doubt the soil Canada will produce either of the before mentioned crops equal in quantity and quality to any raised on the land in the neighboring union.

Draining about dwelling houses, out-houses and homesteads, will be conducive to health, and will prevent ague.

On arable land all surplus water more than sufficient for the benefit of growing crop, should have the means of escaping into drains by percolation. Moisture above the quantity required for vegetation is injurious both to the soil and the crop. The

soil becomes sodden and sour, and robbed of its fertility, and the grain, clover and other grass roots stunted in growth for want of draining; no doubt but a superabundance of wet remaining in the soil tilled to fall wheat without the land being previously drained, is often the cause of killing the crops, when the spring frost has been the supposed cause of injury. The same remark will apply to clover, grass land and meadows.

The best mode of draining, practised in Great Britain is with pipe or tile draining, and now that we have the advantage of the presence of Mr. Charnock, residing at Hamilton, who last year arrived in this Province, with his patent tile draining machine, it is hoped that tile draining hereafter will soon come more into general use.

Another sort of drain is made by opening the land to the usual depth of four feet, placing in the bottom two flag stones forming a flattened cone, thus, Λ, the lower part of the flags to be set firm on the outer side of the bottom, bringing the top parts together, thereby forming the arch or hollow space in the bottom of the drain; and if the space between the side of the drain to the top of the stone flags be filled in with small stones so much the better cover with a light coat of cedar or pine boughs, tramping the earth back in filling up the drain.

When small round boulder stones can be procured, not larger that six inches in diameter, and placed in the bottom of the drain, to the depth of two feet, with a covering six inches thick of small stone broken to pass through a two inch ring, placing cedar boughs thereon and tramping back the earth as above mentioned, always leaving a space at least fifteen or eighteen inches between the boughs and the surface, an excellent drain can be made without the flags.

In many parts of this country, drains are often constructed with hemlock poles laid lengthways, two at the bottom and one over, leaving a hollow below, putting the hemlock bush upon the poles, and tramping the earth back upon them, this sort of drain will last half a century.

When stone cannot be conveniently procured, good drains may be constructed with narrow boxes or tubes of deal boards from four to six inches in the square; holes bored at intervals in the sides. Such, when covered with two or three feet of earth, will last a long time.

To bring the draining of land to anything like a state of perfection, it must be studied as a science. The work should be completed in a substantial methodical manner under professed drainers and laborers employed in the execution of this special work.

It is well established that draining improves the climate as well as the soil; that it is equally conducive to the health of beasts as of men; that it gives an earlier harvest, and lengthens the summers by enabling us to turn our cattle out earlier, and keep them out later.

Drainage in wet, spongy and springy land also eradicates thistles and other weeds, and aquatic plants, and brings inert vegetable matter into action, even the news and scientific method of improving the crops by irrigating the land, would be almost useless without the earth be well prepared to receive the liquid, and the surplus and under spring water prevented lodging in low places, by under draining.

The practice of furrow draining, which is so extensively resorted to for carrying off the surplus water from the wheat crop, must be got rid of, and discontinued before our heavy clayed soils can be brought into a proper state of fertility; the loss to the high table land which is consequent upon laying drains in the furrows in place of under drains, must be well considered. Farmers are as yet unacquainted with the perfect drainage which clay soils admit and require, and their attention has not been fully given to the loss their land sustains by the water running off the surface, particularly in high level clayed lands. But with the adoption of effectual drainage, and with a better acquaintance of the uses of rain and melted snow, the necessity of keeping the land in ridges by furrows will be proved no longer to exist, and agriculturists will become desirous of freeing their land of the impediments to cultivation and to perfect vegetation by under draining, and they will also see the importance of having the ground laid so that every drop of rain may sink into it, and the soil may gain additional fertility which its descent gives in leaving in the earth ammonia and other fertilizing properties brought down by the rain. Hence the higher level lands require under draining even more than low alluvial soils.

Experience has fully shown that covered drains are useful in making the ground between them porous, and the earth as it were a drainer, so that the rain and snow, when the land is thoroughly drained, sink perpendicularly where it falls, till it reaches the level of the drains, and is then hindered from accumulating upwards by the vents there given to it.

It is evident that under drains, when the land above them is well stirred or well fallowed, have a tendency by degrees to make the soil porous. This with the aid of capillary attraction always existing in the earth, will soon make all the land between the drains free and fertile. The distance between the drains is a matter of great importance, probably eight yards in the clear between each drain will be found in all respects the most advantageous.

WEIGHT OF THE DIFFERENT GRAINS AND ROOTS.

The Massachusetts Board of Agriculture, at a meeting a few days ago, received form Col. JOHN N. LINCOLN, of Worcester, a report on the weight of the different crops—understood to have been made after careful experiment and investigation. It is as follows;

	lb.		lb
Corn	56	Carrots	55
Rye	56	Sugar Beets	60
Barley	46	Mangel Wurtzel	60
Buckwheat	46	Ruta Baga	60
Oats	30	Parsnips	45
Wheat	60	Round Turnips	60
Potatoes	60	White Beans	60

THE EXPERIMENTAL FARM, ON THE UNIVERSITY GROUNDS AT TORONTO.

For the Agriculturist.

Observing a discussion in the Legislative Assembly on a grant of £500 to aid in bringing the Experimental Farm into operation, I think it a duty which I owe the public and myself, as well as the Board of Agriculture, to state a few facts relative to the progress of this farm, with which some of the speakers, on the occasion referred to, seemed unacquainted. Indeed, as one or two honorable members appeared to doubt whether anything had really been done by way of preparation, or rather positively affirmed that there had not, it may be desirable that I should state the history of the case, as briefly as possible, from the commencement.

The late Senate of the University passed a Statute appropriating fifty acres of the Park land, for the purposes of investigations and experiments in connection with the Professorship of Agriculture. As one of the objects of the Board of Agriculture, as defined by Statute, is the establishment of an Experimental Farm, the Senate placed the grounds thus appropriated, for a term of years, under the management of the Board, free of charge.

In the summer of 1852, improvements were commenced on about thirty acres of the land, which was in a state of nature, to begin with, wholly unproductive, with the exception of affording, during two or three months of summer, a poor and scanty pasturage; the surface was very uneven, and abounded in roots, stumps and stones. This portion was, after much labor and expense, brought into a tolerable state of cultivation, and the greater part sown to wheat, in the fall of the same year. This was done in the ordinary way, with a view to bring the ground into perfect order by degrees, and to procure some return. The crop was a good one, and the proceeds materially assisted in meeting the expenses. After the wheat came off, the ground was further improved and prepared for cropping the following spring, and some small improvements were likewise made on a portion of the remaining twenty acres.

In the spring of 1851, the probability was intimated that a portion of the ground assigned to the Board, would be required by the Government for public purposes, in order to carry out the proposed plans for erecting the new Parliament Buildings, University, Botanic Gardens, &c.

It was accordingly deemed expedient to restrict, for the present, preparations for Agricultural Experiments to the remaining twenty acres, or something less, occupying the north-west portion of the University grounds. This part was by far the most difficult and expensive to bring into cultivation, the greater portion being filled with a dense second growth of trees, so that little else than hand labor could be made available. Last spring preparations were commenced for bringing this portion of the grounds into a suitable state of cultivation, and a few acres were got into green and root crops, in the ordinary way. During the summer the necessary buildings were commenced, and a portion of the ground will be ready next season, for educational and experimental purposes.

It should be understood that the whole expense of these improvements is under the control of, and borne by, the Board of Agriculture; the grant of £500 by Parliament being intended to assist the Board in surmounting the difficulties necessarily incidental to a commencement.

I may say a word or two with reference to the distinction between a Model and an Experimental farm, since people are very apt to confound the two, as was the case with several Honorable Members in the debate which has given occasion for these remarks.

No single farm, however well managed, in an extensive country, where soil, climate, markets, &c., vary considerably, can be safely regarded as a model, by which all other farms should be conducted. Besides, the means and circumstances of farmers—particularly in new countries—are so very dissimilar, that what one readily accomplishes and makes profitable, might be altogether unsuited or beyond the reach of another. Every good farmer, who makes his business profitable, without impairing the productive capability of his soil, *has a Model farm for his neighborhood;* or, indeed, for every other place, *where all the conditions are similar.* Model farms, supported by the public purse, will not, in general, command the confidence of practical and business men, and they will be peculiarly liable to the charge of prodigal expenditure and theoretical crudities.

The Board of Agriculture, entertaining similar views, resolved on devoting the land, so liberally placed under their control by the University, to illustrative and experimental purposes only. It lays no claim whatever to be a Model farm, which would occupy a large space, and be attended with much risk and a great pecuniary

outlay; whereas, Experimental grounds may be restricted to a few acres, and it is believed that the space yet available to the Board may be made sufficient for the objects sought to be obtained. The annual outlay will be but trifling, after the necessary preliminary preparations are completed.

New and improved varieties of grains, roots, grasses, &c., will continue to be obtained from different countries, with a view to test their adaptation to the soil and climate of Canada; experiments will be made on their feeding qualities for cattle; also on the comparative value of the different substances used as manures, for educational and practical purposes; and the results as obtained will be published in the Quarterly Transactions of the Board. It is further proposed to distribute specimens of such productions, as are likely to suit this country, among Agricultural Societies, with a view to subject them to a wider test, under different conditions of soil and climate, before they are finally recommended for general cultivation. It is thought that the supplying of Societies with materials for more extensive experiments, under different conditions, will be productive of beneficial results.

It is much to be desired that the intentions of the late Government, respecting the University grounds, should be carried into full effect, by a judicious combination of the useful with the ornamental. Much has already been accomplished by way of preparation; and it is hoped that a Botanic Garden, in connection with suitable University Buildings, will soon be seen in juxtaposition with the Experimental Farm;—an ornament to Toronto, and an honor to Canada!

I shall always be happy to show parties, who feel interested in these matters, what is being done, if, when in town, they will honor me with a call.

GEO. BUCKLAND,

Professor of Agriculture, and Manager of the Experimental Farm.

University College,
Toronto, Dec. 29, 1854.

FIRST HORNED CATTLE IN AMERICA.—The first horned cattle brought to America were imported by Columbus in 1482. In 1750 the best dairy farms in Rhode Island contained upward of one hundred cows, and sold 13,000 pounds of butter in five months. Two acres of good land sustained one cow. The present number of cattle in the United States may be estimated at 20,000,000.

THE MONTHS—JANUARY.

The new year commences its career in the cold and dreary depths of winter, and is frequently introduced by biting frosts and driving snow storms; to which, however, the present season must be looked upon by us as a striking exception. The old year with its alternations of joys and sorrows, its hopes and fears, its gratifications and disappointments has passed away, and we have been permitted to enter on another of those important cycles of time, the diligent use of which is the only certain mark of human improvement.

JANUARY derives its name from JANUS, an ancient king of Italy, who after his death was deified by the Romans, and invested with attributes appropriate to one who was to govern the commencement of the year. The old Saxon name of this month was *Aefter-yula*, that is after Christmas in reference to the great festival of the Incarnation. The Saxon names of the months, however, have all been changed, while those of the days have been retained; but the reason for this distinction does not clearly appear.

Plough-Monday occurs about the beginning of the month, it being the first monday after the Epiphany, and was formerly celebrated in our father-land with much glee and merry-making by the rural population. It was so called to denote the duties of the husbandman in returning to his usual occupation after the festivities of Christmas. Ploughs and other implements of husbandry were carefully examined and repaired, and the plough was frequently carried or dragged around the parish for the purpose of soliciting plough money. In some of the more remote parts of England there yet remain traces of this and other ancient usages, having reference to the several operations of Agriculture. The climate of Canada, however, is so widely different from that of the British Isles, whence these customs originated at a very early period of their history, that no practical application could be made of our observing Plough Monday; except, perhaps, that if farmers now-a-days would thoroughly repair their old implements when the season wholly forbids their use, and have everything in readiness for the earliest commencement of operations in Spring, we should have our work better done and in proper season than is commonly the case.

The aspects of winter are usually considered to be monotonous and uninviting, and not a few

of them are commonly complained of as harsh and repulsive. In painting, this season is represented by a thin and bearded old man, shivering with cold; while the sculptor personifies it by one struggling to retain the garment which the furious blast threatens to tear from him. In the frozen north where the sun never appears above the horizon for weeks, or even months, and animal and vegetable life seem to be extinct, nothing can be conceived more dreary and forbidding. Yet even here a compensating power may be seen in operation, so as to render these inhospitable regions the abode of life and comparative enjoyment. The splendid Aurora renders the nights as light as day, and the thick mantle of frozen snow, from its non-conducting quality, prevents the escape of the heat still retained by the surface of the ground, thus affording a secure protection to both vegetable and animal life. In our own more modified climate, amidst the severities of the keenest winters, how much there is in the physical conditions in which we are placed, to awaken a sense of gratitude, to the bountiful author of nature, and to promote the growth of a kind and social spirit. Christmas and New Years' time is a season happily observed in Canada, as it is, or ought to be, in every portion of the christian world, by friendly greetings and neighbourly acts of goodwill and kindness. In the happy, domestic circle, where the scattered members of a family meet together with acquaintances and friends, and music and cheerful converse, and innocent recreations give wings to the happy hours thus devoted to the strengthening of the social ties of kindred and mutual good-will. The blue and sunny skies even of our winters, exert a charming influence over the mind and render this season of comparative leisure one of much social enjoyment.

Still, notwithstanding the friendly greetings and family festivities which happily characterise the close and beginning of each successive year, it must not be overlooked that at this inclement season there must necesarily be severe privation and suffering among such of the domestic animals, and the weak and indigent of our race, as are not properly cared for. The merciful man we are told is merciful to his beast; and the same high authority has pronounced a blessing on him, who considereth, that is befriendeth the the poor. This humanising sentiment so appropriate to, and it is hoped generally characteristic of the present season, has been forcibly described by the poet Burns, in the language of but a partially understood dialect, in a manner that has brought it home to the hearts of thousands:—

"Listening, the doors an' winnocks rattle,
Thought me on the ourie cattle,
Or silly sheep, who bide this brattle,
O' winter war,
And through the drift, deep-lairing sprattle
Beneath a scar.
Ilk happing bird, wee, helpless thing,
That, in the merry months o' spring,
Delighted me to hear thee sing,
What comes o' thee?
When wilt thou cow'r thy chattering wing,
And close thy e'e?"

The principal thing, therefore, which should now occupy the attention of the farmer, who, to be successful in his business, must be a considerate and humane man, is to give all his domesticated animals the necessary food and shelter, for their comfort and improvement. It is important to remark, in this connection, that liberality of treatment is perfectly compatible with the most economical management. The why and the wherefore of this will be treated of in a subsequent paper, when the phenomena and laws of heat will come more fully under consideration. No good farmer neglects to protect his cattle against the injurious influence of cold and wetness, and to prepare as large a supply of nutritious food as circumstances will admit. The best breeds, without strict attention to feeding and housing through the winter months, will necessarily deteriorate. And it should be remembered that these are conditions imposed by the great Artificer of nature, for the most beneficent purposes. Yet, alas, how frequently does ill-informed and obstinate man act in opposition to the wise and unalterable will of his Maker, in matters pertaining to practical science, as well as to morals!

The Canadian farmer, having his buildings tight and his stock properly protected, with sufficient provender, and a regular supply of that essential element—pure water,—with a blazing fire and a cheerful, well-ordered homestead, is in a condition, which the fury and inclemency of the outer-beating storm cannot affect, to diminish his domestic enjoyments. It is difficult to imagine a more enviable home than such a one possesses; particularly if he has acquired those mental and moral habits of character, which sanctify and ennoble the humblest lot. Truly the daily pursuits of the farmer are as innocent as they are useful; and to the observing, truth-seeking mind, they are equally friendly to the growth of useful knowledge, and the feeling of a rational and elevated devotion. What a source of pure enjoyment and ever-increasing

happiness would be opened up, if the cultivators of the soil would more earnestly follow their noble pursuit in the light of the natural and moral laws, which preserve, as a grand unity, the universe of God! Then, indeed, would agriculture be not merely the most useful, but also the noblest and the most innocent pursuit of man.

The present is the most favorable time for farmers to improve their minds, by reading and study. During other portions of the year, there is but little leisure for these things; and, for this reason alone, the young farmer should strive to turn the long winter evenings to a good, intellectual account. Happily now-a-days, and in this country, the want of suitable books cannot be pleaded, as an excuse for ignorance.

This is also a peculiarly suitable time for the farmer to settle his arrangements for spring operations. Implements should be decided on, and everything got in readiness for their execution when the proper season arrives. In short, the conducting of a farm, whether it be large or small, should be based upon order and system; so that every operation be performed at its proper time, and in the best manner. A systematic attention to the details of farm operations has an effect on the annual results of the business, which none can fully comprehend but such as have diligently practised it.

The following are "the twelve good properties of farming," as defined by the quaint old TUSSER, poet, gentleman, and farmer, of the sixteenth century:—

"Good farm and well stored, good housing and dry,
Good corn and good dairy, good market and nigh;
Good shepherd, good tillman, good *Jack*, and good *Gill*,
Make husband and housewife their coffers to fill."

PREMIUMS FOR AGRICULTURAL REPORTS.

The Board of Agriculture offer a premium of the value of £15, for the best Report, on each of the following counties:—BRUCE, SIMCOE and PRESCOTT. If such report be written by the Secretary of the County Agricultural Society of which it treats, the amount of the premium will be £20. This difference is made simply with a view to call out and encourage that useful and important class of officers.

These Reports, in addition to the usual information required respecting the condition of Agricultural Societies within their range, should describe the various soils of the county; modes of farming; value of land; amount of tillage and average of crops; breeds of live stock; implements and machines in use; methods of preserving and applying manures; sketch of past progress, with suggestions for further improvement. The manufacturing and commercial condition and capabilities of the county should likewise be stated, together with any other facts that would illustrate its past history or present condition.

All statistical information should be condensed as much as possible, and, when practicable, put into a tabulated form. The main object of each report should be to afford any intelligent stranger that might read it, a concise, yet an adequately-truthful view of the agricultural condition and industrial pursuits of the county. While all unnecessary particulars are to be avoided in the preparation of these reports, completeness should, as much as possible, be constantly kept in view. Such Reports as contain the greatest amount of useful matter, will be preferred; and it is recommended that they be made sufficiently comprehensive, so as to occupy at least 40 or 50 printed octavo pages. The Board will not award the premium to any Report, although it may happen to be the best sent in, unless it possess sufficient merit.

The Reports must be sent in to the Secretary of the Board of Agriculture, accompanied by a sealed note containing the name and address of the writer, on or before the 1st of August, 1855. Such Reports as obtain premiums will become the property of the Board.

TOWNSHIP OF CALEDON FALL SHOW.

The respected Secretary of this new and rapidly improving Society has sent us a lengthened statement of its first Exhibition, which appears to have been very successful. It is impossible to find space in the *Agriculturist* for even the shortest notice of the shows of our numerous Agricultural Societies; particulars of which are embodied in the Annual Reports sent to the Board of Agriculture, and will be published, we presume, in the contemplated journal and transactions of that body. We are glad to be informed that this norther portion of the county of Peel is progressing in a most satisfactory manner, and that the Horse's, Cattle, Sheep, and Swine, with the different kinds of grain and dairy products, were in general of excellent quality, and the prizes awarded were numerous and liberal. We heartily wish this promising young society permanent success.

THE CANADA FARMER.

The first number of this professedly new Journal is before us. On glancing over its pages, we thought it looked marvelously like the January number of the *Genesee Farmer*, and upon a little closer inspection, we found it to be identically the same publication,—paper, type, matter—all precisely alike,—with the single exception of the *name*, and about a page and a half of letter-press, chiefly of an advertising and puffing character. It is an American, *and not a Canadian*, publication, as its name imports, got up and printed in Rochester, and its very title is branded with deception and falsehood. The same trick was attempted at Cobourg last year, but not succeeding, we suppose, the publication has been now undertaken at Hamilton. We have too much of the spirit of *John Bull* in our composition to let tricks of this sort pass unnoticed. If our cotemporary of the *Genesee Farmer* desires a greater circulation in Canada, we should by no means object to it, if he employed fair and honest means for accomplishing his purpose. And we much misunderstand and overvalue the sound-hearted and national feeling of Canadian farmers, if he do not find in this instance, that the man who cannot regard honesty as a duty, will be shown that, at least, it is the best policy. There *was* a time when the *Genesee Farmer* occupied a high position for character, talent, and usefulness. But it was then in abler and honester hands.

RECENT SALE OF LIVE STOCK IN TORONTO.

Owing to an inadvertence no mention was made in the last number of the *Agriculturist* of the sale of Live stock belonging to a newly formed Cattle Company in the county of York. This stock was imported from England about a year since by Mr. Crew, of this City, who lost, as many of our readers will recollect, several valuable animals on the passage. We hope the price which he obtained for the remainder made up in some degree for the serious loss he sustained in so praiseworthy an enterprise. The following are the prices obtained at the sale, with the names of the purchasers:—

Durham Heifer			£170	0	J. P. Wheeler, Scarborough
3 Sheep	(Improv'd	Leicester)	75	0	H Parsons, Guelph
1 Ram	"	"	25	0	Wride, Scarborough
1 Ewe	"	"	20	0	" "
1 Do	"	"	18	15	Dickson, Richmond Hill
1 Do	"	"	17	10	Thorne, York
1 Do	"	"	12	10	Wheeler, Scarborough
1 Do	"	"	27	10	Parsons, Guelph
1 Boar	"	"	15	0	do do
1 Sow	"	"	14	0	Brown, W Gwillimbury
1 Do	"	"	14	0	Wride, Scarborough

THE PARIS WORLD'S EXHIBITION.

Our readers are already aware that a liberal sum of money has been voted by our Parliament for securing a fitting representation of Canadian industry at the approaching Exhibition to be held at Paris. A Central Committee has been organized in Toronto and Montreal, for Upper and Lower Canada respectively; and several Local County Committees have also been formed. It is proposed to hold an Exhibition in Toronto, sometime in February, for Upper Canada, for the purpose of selecting the best articles to be forwarded to Paris. The Central Committee have issued printed Bills, stating particulars, and requesting that articles be sent in by the first of February next. The time for preparation is now very short, but we trust that our farmers, mechanics, and others, will do their best towards sustaining a movement so important to Canada. The position occupied by this Colony at the World's Exhibition in London, in 1851, was of essential benefit to the Province at large; and if we do ourselves justice on the present occasion, and prepare for a high standing at Paris, the result will be equally encouraging and beneficial. We may further observe, that all articles selected for the Paris Exhibition, will be purchased at their full value, and their owners will receive whatever prizes or honors may be awarded them at Paris. Not a moment should now be lost. The Chairman of the Central Committee is E. W. Thomson, Esq., and the Secretary, G. W. Allan, Esq., both of Toronto.

DURHAM STOCK.

We call attention to Mr. R. Wade's advertisement of his fine young Bulls; which, judging from the well-known 'celebrity of his herd,' must be well diserving the attention of purchasers.

In our last we noticed that Mr. Chapman, of Clockville, Madison County, N. Y. had several Heifers of this much esteemed breed for sale.—Parties therefore desirous of obtaining Durham Stock of genuine purity, of either gender, may suit themselves either with Mr. Wade's or Mr. Chapman's.

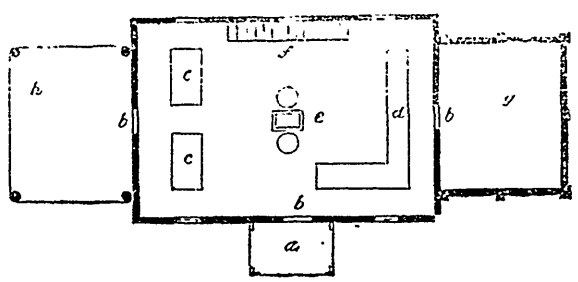
THE AMERICAN HERD BOOK.

Just as we were going to press Mr. Lewis F. Allen's Circular reached us. We are truly glad to find that there is some probability of his pursuing his useful labors, and will give our readers full particulars in our next.

DAIRY BUILDINGS.

Wherever the dairy is made an important branch of farm production, buildings for its distinct accommodation are indispensable. The dairy is as much a *manufactory* as a grist mill, and requires conveniences in its own peculiar line. A building, should therefore be set apart on purpose for its objects; and either for cheese, or butter, separate conveniences are alike required. We give in this number a design of a

CHEESE DAIRY HOUSE.



GROUND PLAN.

This building is one and a half stories high, with a broad, spreading roof of 45° pitch; the ground plan is 10 feet between joists, and the posts 16 feet high. An ice-house, is at one end, and a wood-shed at the opposite end, of the same size. This building is supposed to be erected near the milking sheds of the farm, and in contiguity to the feeding troughs of the cows, or the piggery, and adapted to the convenience of feeding the whey to whichever of these animals the dairyman may select, as both, or either are required to consume it; and to which it may be conveyed in spouts from the dairy room.

INTERIOR ARRANGEMENT.

The front door is protected by a light porch, (*a*,) entering by a door, (*b*,) the main dairy room. The cheese presses, (*c*, *c*,) occupy the left end of the room, between which a passage leads throught a door, (*l*,) into the wood-shed, (*h*,) open on all sides, with its roof resting on four posts set in the ground. The large cheese-table, (*d*,) stands on the opposite end, and is 3 feet wide. In the center of the room is a chimney, (*e*,) with a whey and water boiler, and vats on each side. A flight of stairs, (*f*,) leading into the storage room above, is in the rear. A door, (*b*,) on the

extreme right, leads into the ice-house, (*g*,). There are four windows to the room—two on each side, front and rear. In the loft are placed the shelves for storing the cheese, as soon as sufficiently prepared on the temporary table below. This loft is thoroughly ventilated by windows, and the heat of the sun upon it ripens the cheese rapidly for market. A trapdoor, through the floors, over which is hung a tackle, admits the cheese from below, or passes it down, when prepared for market.

The cheese house should, if possible, be placed on a sloping bank, when it is designed to feed the whey to pigs; and even when it is fed to cows, it is more convenient to pass it to them on a lower level, than to carry it out in buckets. It may, however, if on level ground, be discharged into vats, in a cellar below, and pumped out as wanted. A cellar is convenient—indeed, almost indispensable—under the cheese dairy; and water should be so near as to be easily pumped, or drawn, into the vats and kettles used in running up the curd, or for washing the utensils used in the work. When the milk is kept over night, for the next morning's curd, temporary tables may be placed near the ice-room, to hold the pans or tubs in which it may be set, and the ice used to temper the milk to the proper degree for raising the cream. If the dairy be of such extent as to require larger accommodation than the plan here suggested, a room or two may be partitioned off from the main milk and pressing-room, for washing the vessels and other articles employed, and for setting the milk. Every facility should be made for neatness in all the operations connected with the work.

Different accommodations are required, for making the different kinds of cheese, and in the fitting up of the dairy-house, no *positive* plan of arrangement can be laid down, suited alike to all the work which may be demanded. The dairyman, therefore, will best arrange all these for the particular convenience which he requires. The main plan, and style of building however, we think will generally be approved, as being in an agreeable architectural style, and of convenient construction and shape for the objects intended.

Good Remedies.—For drunkeness, drink water—for health, rise early—to be happy, be honest—to please all, mind your own business.

CANADA, AS NOW UNDERSTOOD IN ENGLAND.

How astonishingly has public opinion at home changed in regard to Canada within a very few years! Formerly this country was considered a frigid and inhospitable clime, adapted to none but the poorest and hardiest class of emigrants. Now we have men of capital, learning and science, constantly coming to our shores, who readily find a field for the profitable employment of their money or talents. This desirable change is doubtless the result of several combined causes, among which may be mentioned the improved and more stable character of our Provincial Legislation, and the publicity that has been given to carefully-arranged statistical information on the immense natural resources of this country.

We copied, a few months since, from the *Gardener's Chronicle*,—an influential paper published in London, under the able superintendence of Professor Lindley,—a very eulogistic article on Canada, founded on the admirably-written pamphlet of the able and indefatigable Secretary of our Board of Statistics, William Hutton, Esq., which that gentleman prepared and published when recently in England. The following is an editorial article of the *Gardener's Chronicle*, of October 28th:—

If we turn to a map of the New World, and cast our eyes to the north of the United States, a vast tract of land will be seen stretching north to the regions of perpetual ice and snow, and east and west across the whole of the immense continent of America. This huge territory contains more than four millions of square miles, more than 2,630 millions of acres, and is equal to about one-ninth of the whole terrestrial surface of the globe. Nay more, it owns the supremacy of our own Sovereign Lady Queen Victoria, and the British possessions in North America are open to the enterprise and energy of Englismen. If we examine a little more closely the south-eastern portion of the district in question, we shall find in Upper and Lower Canada a country with a healthy climate and immense resources, highly prosperous, and rapidly increasing in population and importance. The census of the Canadas, published last year in Quebec, furnishes the materials from which we select the following facts in support of this statement. We confine ourselves more particularly to such details as bear upon agriculture and gardening.

The two Canadas consist together of an area of 242,482 square miles and 155,188,425 acres; of these last 7,300,839 are occupied and cultivated. The population is 1,842,265; so that there are, or rather were in 1852, four cultivated acres to each inhabitant; 164,488 persons, or a little more than one-eleventh of the whole population, are returned as farmers, whilst only 141,949 are re-

turned as laborers; so that, even supposing that by laborer is always meant an agricultural laborer, there are actually 22,539 farmers more than there are laborers. This is in striking contrast with the condition of our own country. England and Wales, as appears from the census of 1851,* contain an area of 58,320 square miles and 37,324,915 statute acres. The population is 17,927,609; so that upon the whole there were, in 1851, little more than 2 acres to a person, or half the quantity which exists in Canada; indeed, even less than that, for the acreage of England and Wales, as given above, includes the uncultivated as well as the cultivated land. With respect, again, to our agricultural population, it appears there are in England and Wales 225,318 farmers, who employ 665,651 laborers; so that, instead of there being, as in Canada, fewer agricultural laborers than farmers, there are nearly three times as many of the former as of the latter. But from the list of occupations in the English census, out of the entire population of Great Britain, amounting to nearly 21 millions of persons, one millior are set down as agricultural outdoor laborers; so that although, as compared with the farmers, the number of laborers in England and Wales is much greater than in Canada, still, as compared with the whole population, the reverse is the case, for here only one person in 21 is an agricultural laborer, whilst there one person in every 13 is so. We confess that we should have thought that there had been more than three agricultural laborers for every farmer in England and Wales; but, from a table in the English census, it appears that as many as 91,698 persons returned themselves as farmers employing no laborers, and more than 33,000 as employing only one; these large numbers of course materially affect the average.

Leaving agriculture for the present, and turning our attention to horticulture, we find that in Canada (Upper and Lower) there are only 421 gardeners and 42 horticulturists, florists, nursery and seedsmen taken altogether. In Lower Canada there are fewer persons of this description than in Upper Canada, and it seems somewhat surprising that except in Montreal and Quebec there should not be a single nursery or seedsman throughout the whole of the former province, and that for the same district only one person should be returned as a horticulturist, and absolutely none as a florist. When it is remembered that the area of Lower Canada is nearly 210,000 square miles, and that its population is 890,000 persons, it does seem strange that only 149, or 1 in a little less than 6,000, should be found making gardening and horticulture the business of their lives. Compare this with Great Britain. The population may be taken at 21 millions, and of this number 80,946 (we may say 81,000) are returned as gardeners, exclusive of 5,000 who are also domestic servants, and exclusive of 2,675 nurserymen and of 1,156 seedsmen. In England, Wales, and Scotland, therefore, there is one non-domestic gardener to every 260 inhabitants; or, in proportion to the population, 23 times as many as in Lower Canada. In Upper Canada there are both absolutely and relatively more gardeners, &c., than in the lower province; in the former, with a population of 952,000, there are 314 gardeners, florists, &c.; that is to say, there is one to every 3,000 inhabitants; or, in proportion to the population, twice as many as in Lower Canada. Canada is not the place for luxuries; in the upper province there are only 94 barbers and hairdressers, or one to every 10,000 persons; and in the lower province there are only 30, or one to every 26,000; on the other hand, if we turn to the useful and necessary branches of industry, we find 10,268 carpenters, 7,075 blacksmiths, and 8,967 boot and shoemakers.

The Canada census contains some very interesting returns relative to the agricultural produce of the country. From them it appears that in both provinces together there are 1,136,311 acres of Wheat, yielding in Upper Canada 16, and in Lower Canada 9 bushels per acre, and 13 and 3 bushels per individual respectively. There are nearly 78,000 acres of Rye, yielding on an averaage 11 bushels per acre; 329,755 acres of Peas, yielding in Upper Canada 14, and in Lower Canada 9 bushels per acre; 913,356 acres of Oats, yielding as before 26 and 20 bushels per acre; and 65,650 acres of Barley, yielding on an average 21 bushels per acre. Barley is the only crop which it appears from the returns is yielded in greater quantities per acre in Lower than in Upper Canada. Wheat is in the tables valued at 4s. the bushel; Rye at 2s. 6d.; Barley at 3s.; Oats at 1s.; and Hay at 40s. per ton. Horses are estimated at £12 10s.; milch cows at £3 15s.; oxen at £6; sheep at 7s. 6d.; and swine at £1.

A rapidly-increasing population is always admitted to be a sure sign of prosperity, and we cannot conclude the present article better than by the following facts relating to this subject. In the 10 years ending in 1851 the population of Great Britain increased more than 13 per cent., that of the United States more than 35 per cent., and that of Upper Canada more than 104 per cent. In the far west of Canada, the counties of Huron, Perth, and Bruce, increased from 5,600 in 1841 to 37,580 in 1851, being upwards of 571 per cent. in 10 years—an increase almost beyond comprehension. England has in the average 332 persons to a square mile; Wales, 136; Scotland, only 92; whilst Upper Canada has 29; Lower Canada, 4; and the United States, 16; so that the land even now occupied in Upper Canada would hold more than 11 times its present population, say 11,000,000 inhabitants, to be as densely peopled as England. In fact, about two-thirds of the population of London alone may be taken to represent the number of persons in all Canada.

In a late Number of the *Gardener's Chronicle* (June 3, 1854,) we ventured to say "that no part of the world now presents such undoubted opportunities of acquiring rapid independence as the British possessions in North America, and more especially Canada;" that opinion was founded more particularly on a pamphlet* then referred

* The Census of Great Britain in 1851; Longman, 1854. By authority of the Registrar-General.

* Canada; its present Condition, Prospects, and Resources. Stanford, Charing Cross.

to, and is amply warranted by the official returns contained in the report from which the above details have been taken.

HUTTON'S GUIDE TO CANADA.

We copy the following from the November number of "*The Journal of the Albert National Agricultural Training Institution, and Record of Industrial progress:*" an admirably got up monthly publication in connection with the Experimental Farm at Glasnevin, near Dublin :—

We hail the well timed appearance of this little volume with peculiar satisfaction; first, because we have the pleasure of knowing the worthy author, whose respected family reside near us, and are our frequent and welcome visitors; and secondly, because we have the fullest reliance upon the truth and accuracy of its details. No person will deny that much knowledge may be gained from the observation of intelligent travellers; and indeed without the aid of such enterprising men we should sit in comparative darkness respecting many portions of the world. But when we look for particulars to guide us in the selection of a *home*—then we naturally and anxiously seek for the latest, the most experienced, and the most practical authority; and after a pleasing and attentive study of this book, we feel assured we have found it in Mr. Hutton's *Guide to Canada.*

We have certainly felt frequent astonishment that among our own countrymen so great a predilection should be felt for emigrating to the United States in preference to Canada, and we believe that our admitted national prejudices have had some, and not an inconsiderable share in their decision. The idea of a more perfect enjoyment of liberty—the complete severance of monarchical ties—and the dislike to British authority across the Atlantic—may have influenced multitudes in ther choice, and may cause many yet to pause and doubt. But that these feelings have been shared by emigrants from other countries, or by the best informed among our own countrymen is certainly not the case, as will more decidedly appear on consulting the 4th chapter of this work, wherein it is shown (a due estimate of the size and extent of the two countries being taken into account) that the emigration from Europe to Canada during a period of 20 years, from 1830 to 1850, has been as 5 to 1 over that to the United States, and we believe the number of our own countrymen who, after landing in New York, ultimately pass over into Canada is very great.

We also know, and have frequent proof, that Canada is by far the healthiest country, and that the deaths among our emigrants to the United States are numerous and appalling. It is a known fact that multitudes suffer grievously in their health, and would fain return home had they the means to do so, particularly as their children are reared with difficulty. We ourselves know those who have come back and declared they would have been left childless had they remained. Now, so far from this being the case with regard to Canada, Mr. Hutton and his excellent and amiable lady, after an absence of 20 years, are in vigorous health, and we may add that their numerous family are the same.

Upon many other grounds we think highly of Canada, and upon none more decidedly than that it is a land of liberty and not of slavery. Many may say that the Northern *States* are exempt from the foul and disgraceful traffic in human flesh and blood; and so they are But we cannot consider that even the Northern States, however glorious and estimable in other points of view, can ever be considered in the light of a perfectly free country, so long as they are bound down by the laws of their *own Union*, to assist, under heavy penalties, in the apprehension of suffering fellow creatures, whose only crime is the exercise of nature's dearest rights—escape from unwilling and most cruel bondage. It has been eloquently written, "disguise thyself as thou wilt, still, slavery, thou art a bitter draught." But America disguises nothing, and presents the "bitter draught" in all its hideous repulsiveness Can there be a stronger argument in favor of Canada?

THE INDUSTRIAL ARTS.

MANUFACTURES OF IRON.

The manufactures of iron are of every imaginable shape and adapted to a thousand different uses. A brief description of the process by which some of the articles in common use are made, will no doubt be interesting to our younger readers. The process by which many of the coarser tools are manufactured may be seen in any common blacksmith's shop, but you will go there in vain to learn how to make a file, a pin or a needle.

FILES.—A file is a very important tool. They are as every body knows, of various shape, as flat, round, square, half round, three square, four square, and so on. They are all divided into two varieties, from the form of their teeth. When the teeth are a series of sharp edges appearing like parallel furrows, they are termed single cut; but when these teeth are crossed by a second of similar teeth, they are said to be double cut. The first are suited for brass and copper, and the second for the harder metals. Files have also different names according to their degrees of fineness. The heavier and coarser kinds of files are made from the inferior kinds of blistered steel. The finest kinds are made from the steel of the best Swedish iron, the bars of steel being selected according to the shape and use of the files to be made.

Files are made at a forge. The forge consists of fire-bellows, with coke as fuel. The anvil, one or more of which are sometimes set on the stone bench, is large, set in a large bench-like mass of mill-stone grit, and has a projection at one end, and a hole to contain a sharp-edged tool for cutting the files from the rods. It also contains a deep groove for dies and bosses.

The flat and square files are formed entirely by the hammer. One man holds the red hot bar, and strikes with a small hammer; another stands before the anvil with a two-headed hammer; the latter is in general very heavy, with a broad face for the large files. They both strike with such truth as to make the surface smooth and flat with-

out hard hammering. There are hammers of various sizes and peculiar shapes, and other small instruments at hand; there are various notches, ridges, curvatures, and guages on and about the anvils. When made into form, the files are then annealed or "lighted," in order to bring the steel to the state of softness fitted for the cutting of the teeth; next succeeds the process of grinding, by which a true and regular surface is given to the face of the intended file or blanks, as they are termed previous to the cutting of the teeth.

This is performed by a hammer and chisel; the hammers weigh from one to six pounds; the chisels are a little broader than the file, sharpened to an angle of about 20 degrees. The file is first laid upon the bare anvil, one end projecting over its front, and the other over its back; a leather strap now goes over each end of the file, and passes down upon each side of the block to the workman's feet, which being put into the strap on each side, like a stirrup, holds the file firmly upon the anvil as it is cut. The hammers employed have the handle placed in a remarkable manner with respect to the head, being adapted at such an angle that the cutler can, while making the blow, *pull* the hammer in some degree towards him, and thus give a peculiarity to the shape of the tooth. If the file is a flat one, the cutler places the small steel chisel with his left hand on it at a particular angle, and then with the hammer in his right, cuts an indentation; he then cuts another parallel to it, then another and another to the end of the file, shifting the file slightly in its fastening as he proceeds, and this he does with inconceivable rapidity. The double teeth are cut in a similar manner, one set of cuts crossing the other at an angle more or less acute. The cut is not a mere indentation made without reference to form; it is a triangular groove of particular shape, the production of which requires a discriminating tact in the management of both the hammer and cutting-tool, which can only be obtained by a long apprenticeship to the business; and which machinery, great as may be its powers, has hitherto failed to reveal. After the files have been cut, they are next hardened, and in this process three things are especially held in view—first, to prepare the file on the surface so as to prevent it from being oxidated by the atmosphere when the file is red-hot, which would take off the sharpness of the tooth—secondly, the requisite hardness has to be obtained—and lastly, the file has to be prevented from attaining the slightest bend or warping.

The first object is accomplished by laying a substance upon the file which, when it fuzes, forms as it were a vanish on the surface, defending the metal from the oxygen of the air. This paste is composed of common salt, ale grounds, and bean flour. The file is now heated by being held by the tank with a pair of tongs into a coke fire; when it is uniformly heated from the tank to the point of a cherry-red colour, it is suddenly quenched in the coldest water, being at the same time kept in a perpendicular position. Half round files are an exception to this rule, being quenched in a horizontal direction. This management prevents the file from warping. After the files are hardened, they are scrubbed clean with sand and water; and lastly, they pass into the hand of the fireman, who strikes the file gently on a piece of hard steel, and also rubs it from end to end; and from the sound he can tell at once, so great is his perception by long habit, whether it has the temper necessary to make a good file.

Manufacture of Needles.—It is scarcely necessary to say that needles are made of steel, and that the steel is brought into the state of fine wire before it can assume the form of needles. The needle-makers do not make the wire, but purchase it. Having obtained the wire, which is bought in coils in weight about thirteen pounds, in length about a mile and a quarter; it is first put under the guage to be tested as to its exact diameter; it is then carried to the cutting shop, where it is cut into pieces equal to the length of two of the needles about to be made. This operation is performed not by cutting them singly, but the workman takes about a hundred wires at once, grasps them between his hands, and then cuts them with a large pair of shears. These pieces have next to be straightened. This is effected by inclosing them within two iron rings, and placing them on a small furnace, where they are made red-hot; on being taken out in a glowing state, they are placed on an iron plate, and taking a long piece of iron or steel adapted for the purpose, the workman rubs the needles backwards and forwards, causing each needle to roll over on its axis, and also over and under those by which it is surrounded, till the action of one wire on another brings them all to a perfectly straight form.

Each of the pieces so manufactured is designed for two needles; the two ends constituting the points, and both points are made before the piece of wire is divided into two. The pointing immediately succeeds the rubbing, and consists in grinding down each end of the wire till it is perfectly sharp. They are ground on a small grindstone, and the needle-pointer takes fifty or a hundred of the needle pieces in his hand at once; he holds them in a very peculiar manner, and so nicely arranges his joints and fingers, that during the process of grinding every needle can be made to rotate on its own axis, by a slight movement of the hand, without any one needle being allowed to roll over the others. He grasps them so that the end of the wires (one end of each) projects a small distance beyond the edge of the hand and fingers, and these ends he applies to the grindstone, in the proper position for grinding them down to a point. The needle-grinders are the subjects of extreme pity. Their life is a living death. The particles of stone and steel pervading the air they breathe on every side, soon lays the foundation of disease on the lungs, called the "grinders' asthma:" it generally commences before they are five-and-twenty, and they linger out a miserable existence till about the age of thirty-five or forty, beyond that age very few dry-grinders are known to live. What a subject of reflection to those who seek to benefit the human race. It ought, however, to be remembered that the needle-grinders refuse to employ a mouth-

guard, which would to a considerable extent protect them from this injury.

The next process the little piece of straight wire undergoes is to pierce it near the centre of its length with two little holes, which are to form the eyes of the future needles. This is performed by a stamping machine, which consists of a heavy block of stone, supporting, on its upper surface, a bed of iron; and on this bed is placed the under half of a die or stamp. Above this is suspended a hammer, weighing about 30lbs, which has on its lower surface the other half of the die or impress. The hammer is governed by a lever moved by the foot, so that it can be brought down exactly on the iron bed. The workman, holding in his hand several of the pieces of wire, drops one at a time on the bed-iron of the machine, adjusts it to the die, brings down the upper die upon it by an action of the foot, and allows it to fall into a little desk when done. This he does with such rapidity, that one stamper can stamp four thousand wires, or eight thousand needles in an hour; or nearly a hundred thousand in a day.

The eye of the needle has now to be pierced through; this is effected by boys, each of whom work at a little hand-press. He lays them flat on a small iron bed or slab, holding one end of each wire in his left hand, and bringing the middle of the wire to the middle of the press, exactly under two hardened steel points; he then moves the press, the points descend, and two little bits of steel are cut out of the wire, thereby forming the eyes of two needles. The pieces are then "spitted" by the juvenile labourers, that is, a wire is passed through each of the eye-holes, and when the whole are spitted, they present the appearance of a double-toothed comb. A workman then files down the bur or protuberance left on the side of the eyes by the stamping. The comb of needles is next worked backwards and forwards till it separates, leaving a bunch of needles on each wire.

The needles are now put into the hands of the soft-straightener, generally a female, who rubs them, one by one, on a small steel plate with a curved steel bar; and so quickly in this process performed, that she can straighten thirty or forty thousand needles a day.

It is now necessary that the needles should be hardened and tempered. They are spread in regular thick layers on narrow plates or trays of iron, heated in a furnace, and then immersed in cold water or oil. To temper them they are placed on an iron plate, heated from beneath, and gradually brought to a proper degree of temperature. After this, they again undergo another straightening process, called hammer-straightening, which is performed also by females, who, placing them on a small steel block, give each a small blow in the right direction with a tiny hammer.

The next process is the scouring, which is effected in the following manner;—A strip of very thick canvas is laid open on a bench, and on this a large heap of needles, amounting to perhaps twenty or thirty thousand, is laid; all the needles being parallel one with another. They are then slightly coated with a mixture of emery and oil, and tied up tightly in the canvas, the whole forming a compact mass, about two feet long and two inches in thickness. Twenty-four rolls of needles being thus prepared, comprising nearly six hundred thousand in all, they are placed under the rubbers of the scouring machine; and steam or water power, with a connecting mechanism, gives to the rubbers a backward and forward motion, which causes the needles in each bundle to rub over each other, and, by the continued friction, they are scoured. This is carried on for eight hours, after which they are taken out and washed, placed in pieces of canvas, touched with emery and oil, and subjected again to the process, which is repeated for six or seven times.

The needles are next examined, and all the imperfect ones removed; the points are all turned one way, and the heads are next rounded off by means of grinding wheels as they pass to the polishing wheel, which consists of wood, coated with buff leather, of which the surface is slightly touched with polishing paste. The needles are held against the wheels as they revolve. About a thousand an hour can be polished by one man; and when they have been subjected to this process the needles may be called finished; nothing now remains but to put them up into small packets of twenty-five each, which is performed by children, and they are ready for the market.

Warranted not to cut in the eye. We remember once purchasing of a travelling hawker some needles so described on the outside of the wrapper, and upon opening it found the needles to have no eyes at all. Needles, however, are manufactured with this improvement, which consists of drilling the eye with a very fine instrument, by which its margin becomes as perfectly smooth and brilliant as any other part of the needle. This kind of needle is the pride of the modern needle-manufacturer.

ROBERT ABRAHAM LATE EDITOR OF THE FARMER'S JOURNAL.

(From the Farmer's Journal, Montreal.)

This Gentleman, who has conducted the *Farmer's Journal* from its commencement, and who gave in its pages such earnest evidence of his deep seated interest in agricultural pursuits, died in Montreal on the 10th November, 1851. Mr. Abraham was born in the fine grazing and agricultural county of Cumberland, where he first imbibed that fondness for the country and its pursuits, which show themselves so constantly in his writings, and which did not leave him until the breath of life had left his body, for according to one of his biographers, his thoughts to the very last, wandered among green fields, and beds of flowers cheated his imagination, as he descended the dark path which leads to the valley of the shadow of death. Mr. Abraham was originally a man of robust and herculean frame, and was famous as a young man for excelling in all the manly and athletic sports and exercises, which prevail in the rural districts of the northern counties of England. He took a Degree as Doctor of Medicine in the University of Edinburgh, and

practised his profession for sometime in Whitehaven. Subsequently Mr. Abraham conducted a political journal in that town,—he removed thence to London, and afterwards to Liverpool, where for many years he conducted with marked ability a leading newspaper. He came to this country about ten years ago, and was editor and proprietor of the *Montreal Gazette*, and afterwards edited the "Transcript" displaying great ability in the conduct of both journals. Mr. Abraham edited the *Farmer's Journal*, and his name and memory will be associated in the minds of our readers with many an admirable contribution to its pages. A few years ago, Mr. Abraham qualified for the profession of the Law in Montreal, and nothing can shew the wonderful versatility of his talents more, than the facility with which he mastered the details of his new profession. About two years ago, his general health began to fail. His mental powers had been overtasked, and symptoms of softening of the brain, and threatenings of paralysis appeared, to warn him that the time appointed for all men was fast coming to him. He died on the evening of Friday, Nov. 10th, leaving a widow but no children. He was a man of genial habits, enlarged heart, and kindly feelings, and is much regretted by those who knew him best.

☞ Apology.—We regret to find, when too late to remedy the evil, that our *paper* is again of an inferior quality. We ordered good paper, and pay a *good* price for it, but we are imposed upon, and cannot help ourselves.

TRANSACTIONS OF THE NEW YORK STATE AGRICULTURAL SOCIETY, FOR 1853.

Another large and instructive Annual Volume of this numerous and influential Society has been received just as we were going to press; for which the able and esteemed Secretary, B. P. Johnson, Esq., will please accept our best thanks. Judging from a hasty turning over of the pages, this volume, in the interest and variety of its subjects, appears in no way inferior to its predecessors,—which is no slight praise. We shall notice it more fully hereafter.

THE ANGLO-AMERICAN MAGAGZINE; JANUARY 1855; TORONTO; MACLEAR & CO.

This is the first number of a new volume of this excellent *Canadian* periodical,—namely the sixth;—offering therefore a good opportunity to new subscribers patronising this work,—the present number contains three well executed plates,—a portrait of General Sir John Cope Sherbrooke; the Parisian Fashions for the month; and a Plan of the British American Forces below New Orleans, on the 8th of January 1815;—illustrating the History of the American War; which, after occupying several pages of each number of the magazine for the last two years, is now brought to a conclusion. The contents and "getting up" of this instructive and amusing Miscellany, being in its literary and mechanical execution essentially a *Native production*, has a strong claim on the patronage of all our British American fellow subjects:—and we trust that the enterprising Publishers will speedily meet with that high degree of support which their enterprise and perseverance highly deserve.

CHAMBER'S JOURNAL OF POPULAR LITERATURE, SCIENCE AND ARTS; PARTS 10 AND 11; TORONTO: A. H. ARMOUR & CO.

This cheap and instructive periodical continues to maintain the position which it has so long occupied. It is admirably adapted to a rapidly increasing class in all countries where the English language is understood, (thanks to Popular Education) to afford the millions of all classes of society, with rational amusement and solid instruction. The Edinburgh Edition can be supplied in monthly parts by Mr. Armour of this city, and the principal booksellers throughout Canada, for the very moderate charge of $2 per annum.

CONTENTS OF No. 1.

The Canadian Agriculturist Almanac for 1855.

Months.	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Jany	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
Feby	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28			
Mar.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
Apr.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30					
May	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
June	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30

THE

CANADIAN AGRICULTURIST,

IS PUBLISHED MONTHLY, at Toronto, Upper Canada, and devoted to the improvement of *Agriculture, Horticulture, Farm Mechanics*, and to the advancement of the *Farmers' interests generally*. It commences its Seventh Volume this year, 1855. Each number contains 32 large octavo pages.

The *Agriculturist* is Illustrated with Engravings of Cattle, Implements, Farm Houses, Farm Buildings, &c. and is the *only* Agricultural paper printed and published in Upper Canada. Receiving as exchanges the leading Agricultural Journals of the United States and Great Britain, the Editors are able to select, and lay before their readers every thing of value that may appear in these papers.

The *Agriculturist* contains, besides Editorial and Miscellaneous matter, Reports of Farmers' Clubs Essays, Proceedings of the Board of Agriculture, Prize List of the Agricultural Association Information and Hints to Agricultural Societies, &c. &c. It is strictly a Canadian work, and should be taken in by every Farmer who desires to improve himself, or who feels any pride in the advancement of his country.

Professor Buckland, of Toronto University, continues to assist as Editor.

Some of the most intelligent Practical Farmers in the Province are contributers to this journal

The *Agriculturist* is not a second edition of the *Genesee Farmer*, nor of any other foreign publication. It is a *home production*, and asks no man's support under a false name. It is a true, not a spurious *Canada Farmer*.

TERMS:

Twenty copies or upwards, each ..... 2s. 6d.
Single copy ..... 5s.

*** The *Agriculturist* is not liable to *Postage*.

☞ Newspapers inserting the above will do us a favor, and entitle themselves to a copy without exchange.

WM. McDOUGALL,
Publisher, Toronto.

January, 1855.

Months.	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
July	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
Aug	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	
Sept	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30						
Oct.	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
Nov.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	
Dec.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31					