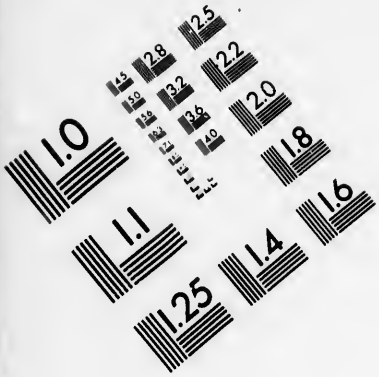

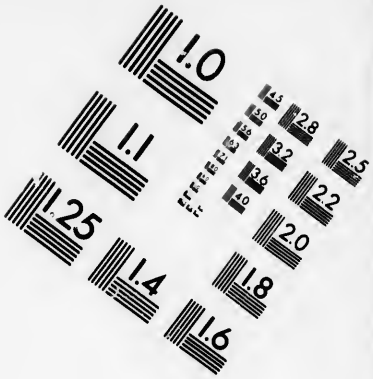

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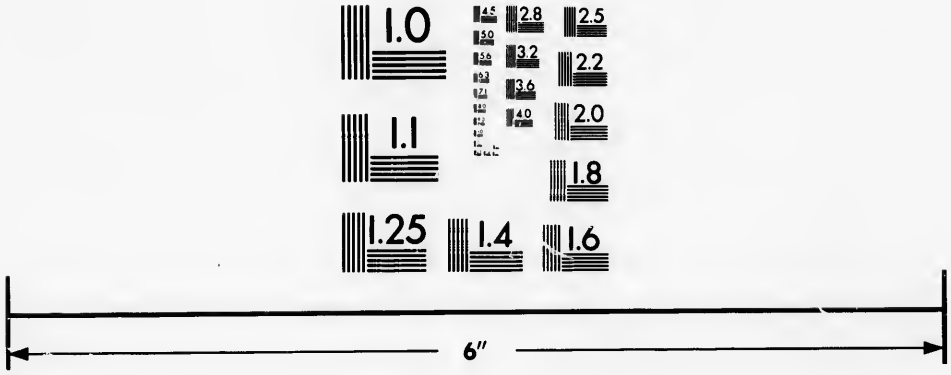

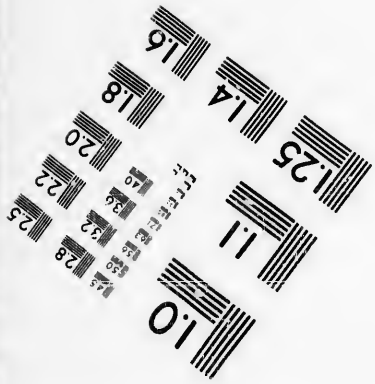

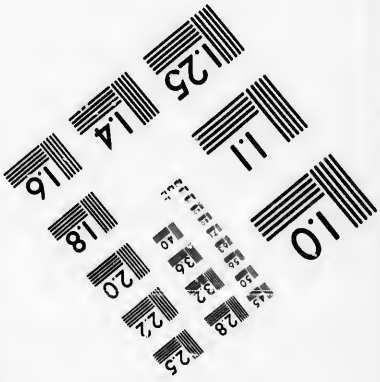

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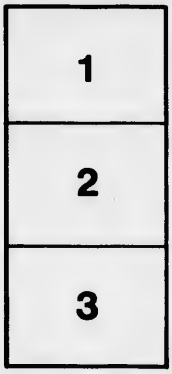

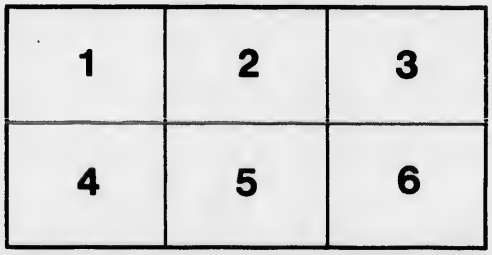

PRACTICAL AGRICULTURE.

By James Croil Esq. Morrisburg. Ont.

The object of our meeting together is to excite an interest in our farmers, in support of their Agricultural Society. The association has for its object the improvement of agriculture, so that the subject that has been allotted to me, is at once the most appropriate that could be suggested, as it is certainly the most agreeable that I could have been asked to address you upon:—*Practical Agriculture*, or the Practice of Ariculture, not as opposed to scientific farming, but as contra distinguished to *theoretical* farming. I regret, however, that the subject has not fallen into abler hands. Simple though at first it may appear, there is a vast deal more comprehended in what is defined as practical agriculture than we would at first suppose. And were I to look back upon the ten years in which I have been interested in the agriculture and the Agricultural Society of this county, and to regard the interest hitherto manifested in its support as a criterion for the future, I should have to acknowledge my fears that I had come to address to you a *popular* lecture upon a very *unpopular* subject.

To treat the subject as its importance demands, I should have to trace its history from the time that man was first doomed to earn his bread with the sweat of his brow, down to the present time. And in doing so we should have to notice the many ups and downs that have either accelerated or hindered its progress during the intervening ages. But, as this branch of the subject, might very properly occupy not only a lecture but a whole course of lectures, I shall pass it by at once. And in the few words I have to say to you, I shall confine myself to the Practice of Agriculture, as we find it in the 19th century. And for the more clear elucidation of the subject and its more regular examination, we shall consider it very briefly in the different phases under which it occurs.

Farmers are divided into two classes: those who practise agriculture with a view to earning a livelihood by it, and those who follow it as an amusement or recreation. The former are divided into as many classes as there are different systems or kinds of farming, such as grain farmers, sheep farmers, dairy farmers, &c. These are what we call practical farmers. These are the men who provide food for the million—to whom the nation look up next to Providence for the supply of their daily food. The other classes of farmers are divided into such distinctions as these: the experimental, the theoretical, and the gentleman farmer.

Now, although I have undertaken to speak to you of *practical* farming, and another gentleman to speak to you of *scientific* farming, you are not to imagine that I throw agricultural science overboard. For what is science? It means knowledge; and this is the very idea I wish now to convey to you—the desirableness of having a thorough knowledge of your profession, and if there be any difference of opinion betwixt me and any other gentleman here present, it must be with regard, not to amount, but the kind of knowledge most desirable for a farmer

to possess. Or, in other words, as to what are the essential qualifications of a good practical farmer.

Now, I will at once take up the ground that I mean to occupy and make the broad assertion, that an intimate knowledge of the sciences of Chemistry, Botany, Zoology, Geology, Entomology, or any of the other ologies is not indispensibly necessary to the successful practice of agriculture. Now, understand me thoroughly at this point: I am not inclined to put a light estimate upon the value of the sciences we have referred to. Who can for a moment doubt the effect which the wonderful advances in these sciences has made upon the civilization of the world? And we are not to suppose that agriculture has not received some, nay, very much benefit from the researches of scientific men. Neither must you suppose that, while I advocate the supremacy of the more practical parts of our profession, I would therefore exclude the scientific branches from the education of the rising generation of farmers. Upon the contrary, I look upon them as accomplishments which every man—laying claim to be an intelligent and educated man, in the modern acceptation of the term—should be thoroughly conversant with: for the very same reason that I look upon painting and sculpture, music and dancing as most desirable accomplishments. But you will sooner convince me that it is essential for a farmer to learn the art of dancing, how to "trip it on the light fantastic toe," than you will persuade me, that to be a first-rate farmer, it is essential that he should be an adept in analytical chemistry.

Without the most remote knowledge of the science of Botany, we have the knowledge suggested by experience and observation, that certain kinds of plants are best adapted to certain kinds of soils and climates, and systems of cultivation. We can distinguish between wheat and chess, between chess and oats, between potatoes and cabbage, while the science of Botany has failed to account for the astonishing similarity that does exist between wheat and chess. And all the sciences combined, and Dr. Liebig at the head of them, have failed to tell us what has produced the potato rot, or to shew how it acts upon the plant, much less to demonstrate a cure.

Without a knowledge of the science of meteorology, the prudence and foresight of the practical farmer enable him to predict and prepare for the coming storm. And instead of racking his brains with idle speculations in regard to comets that are to disconcert the seasons, or to annihilate the earth by their touch, he reposes confidence in Him who hath said: "While the earth remaineth, seed-time, and harvest, and cold, and heat, and summer, and winter, and day, and night shall not cease." Instead of trying to master the theory of storms and the currents of the winds, he pursues the even tenor of his way, remembering who hath said: "He that observeth the wind shall not sow, and he that regardeth the clouds shall not reap."

Without an accurate knowledge of Zoology, we are enabled by practice and observation, to form a very correct estimate of the properties possessed by certain classes of animals, that render them valuable to us for certain purposes.

At our last meeting, Mr. Stephens, author of "The Book of the Farm," (and himself an eminent practical Scotch farmer,) was cited as high authority in support of the importance of scientific farming. But I find that his views and my own so nearly coincide, that I cannot do better than give his summing up of the whole matter, in his own language, which is so clear and pointed as to leave no room for misapprehension. He says:

"The chief obstacle which exists to the advancement of scientific agriculture, is to be found in the unacquaintance of men of science with practical agriculture. Were the men of science to become acquainted with practice, much

greater advancements might be expected in scientific agriculture, than if the practical man were to become a man of science; because, men of science, as such, are more capable of conducting scientific research, and until the relations betwixt principle and practice are well understood, scientific researches, though important in themselves and interesting in their investigations, tend to no practical utility in agriculture; in short, until the facts of husbandry be acquired by practice, men of science will in vain endeavour to construct a satisfactory theory of agriculture, on the principles of the inductive philosophy." Here is the greatest compliment he can confer: "I am convinced that it is in the power of science to benefit agriculture, though perhaps not to the same degree which the sanguine expectations of many of its true friends would induce farmers to believe." The truth is, Mr. Stephens was writing a book on agriculture, so full and comprehensive as to commend itself to every taste; but had you asked him as a practical farmer his honest opinion of the scientific part of it, he would very likely have reminded you of the proverb: "He that tilleth his land shall have plenty of bread; but he that followeth vain persons is void of understanding."

I will now consider what are the essential qualifications of a good farmer, and how they are to be brought to bear upon his profession; or, in other words, what system shall a man adopt to entitle him to the name of a good farmer?

Were I now addressing myself to an old country audience, my catalogue of qualifications should have to extend over a very wide field, and I should certainly (entertaining the old fashioned views which I do, with regard to agriculture,) have to warn my hearers against being carried away with every wind of doctrine that scientific or theoretical men may advance. But, as I am now situated, I do not think there is any need for this warning; I have no apprehension that there is the slightest danger that any of my hearers will fall into this error.

The qualifications of a good practical farmer are twofold—mental and physical. I take for granted that we are all agreed, that every man should be possessed of a good sound education—such an education at least as the common schools of the country afford—and really we cannot sufficiently estimate the benefit that must arise from the working of our school system. I do think that the system is a good one, and, like everything else in a new country, must take time to develope itself. We already see the fruits of it. Many of our young men whose education commenced in the common schools of the country, and where they imbibed the first desires for higher attainments, have distinguished themselves, in the various branches of the learned profession in this country. But not in the common schools nor any other schools can we derive that information which makes a good farmer. We all know that if we wish to make a youth a shoemaker, or a carpenter, or a tradesman of any kind, we first send him to school in order that his mind may be expanded and prepared to receive the seeds of practical instruction, and just in proportion to his intelligence and the extent of his education, we form an estimate of the success that awaits him in after life. The amount of education beyond which the common school affords may be extended to any length you please, just according to your means and your appreciation of literary attainments; but for my present purpose this is all I demand. This I consider the first qualification of a good practical farmer: he must have a good sound education.

The next indispensible qualification is, he must be a man of good common sense. Now, although a good education will develope, it can never originate this sterling qualification; and hence we see many men with fine intellects, thoroughly versed in all the attainments of a highly finished education, and yet woefully deficient in this essential quality.

Now, without this I defy any man to be a good practical farmer. Having a good sound education, and possessed of good common sense, a man is still far from being a good practical farmer, just exactly so far as he is from being a good shoemaker, or carriage maker, and it is quite as necessary for the practical farmer to undergo an apprenticeship to farming, in order that he may set out in the world with credit and profit to himself, as it is to attain proficiency in any other business.

It is quite true that there is nothing so very mysterious about farming but that any man may take it up at his own hand: this is what we call learning by experience. Now, although experience teaches even fools, we all know it is dear bought learning; and unquestionably that man has the advantage, who, before entering on a farm on his own account, has lived and worked a couple of years upon another's farm, not only with the view of seeing and learning how to perform agricultural operations, but to enquire into the rational of every thing connected with them, and to have the study impressed upon his mind as a settled and fixed principle, which, if carried out must result in success, and on the other hand cannot be departed from with impunity.

We have self-taught artists, and self-taught mechanics, and self-taught farmers, lots of them; and as we look upon the former as a spurious breed, and not to be relied upon, so I am inclined to look upon the self-taught farmer: he is a Jack-of-all-trades and master of none. He tries one system of farming and that does not pay. He flies off at a tangent to another, and that is equally bad. He finds something at last that *must* pay, he goes into it wholesale and he comes out of it miserably disappointed. Give me the man of good sound education, of good common sense. Give me the regular apprenticed practical farmer, whether he has served his apprenticeship on his father's farm or another's. He commences the world fully impressed with the necessity of accommodating his system of farming to the peculiar circumstances of country, climate, or of soil in which he is placed, he scans intelligently the field of his future labours, he adopts a system—he never loses sight of it—though he may for a time be required to exercise patience, and to live in hope—he does so in the full assurance that in due time he shall reap the benefit.

These then are the mental qualifications of a good practical farmer; but in a country such as we live in, the qualifications we have referred to, ample though they may appear, are still insufficient to render succesful the efforts of the practical farmer. And my own experience, corroborated, I am sure, by every farmer now listening to me, is, that in addition to these mental attainments, the Canadian farmer, must himself be physically able and willing to put his own shoulder to the wheel, and if he cannot perform all that is necessary to be done himself, he must at least share in the labours of those whom he has engaged to assist him. In my native country, in that portion of it with which I am most familiar—the Lothians—farming is carried on so extensively as to render this qualification quite unnecessary; farming there bears more analogy to manufacturing and some other branches of business, and the man of talent and capital embarks his money in it as in any other speculation, and he does not say: if I have good crops, and if I have a good man, and a good team to help me, I shall do so and so; but he says: I know that I can grow 40, 50 or 60 bushels of wheat per acre, as the case may be; I know what it will cost me to do so and what profit I shall have; therefore it is a simple matter of pounds, shillings and pence, how much money he shall invest in farming.

Now, some of you will say, if farming is such a nice business in the old country, what brings so many poor Scotch bodies here? Those who are really poor come here because the wages in Scotland are so small, (or rather, were so small), that the labouring man can do little more than earn salt to his

kail. This of course is all in favour of the Scotch farmer. And those again who possess a limited capital come here because a much smaller capital will buy the land and stock here, than will simply stock a farm at home. The capital required to stock a rented farm and pay expenses till the first crop is sold is about £15 per acre, so that to stock a farm of 300 acres, which is a very usual size, requires a capital of nearly $25,000.

Presuming then that you agree with me that a good education, common sense, and physical ability, are all the requisites for a good practical farmer in Canada, I will consider wherein the excellence of good farming consists. I must first, however, divide the practice of agriculture, into the different branches of which it is composed, and each of these systems is governed by leading fixed principles: you will now begin to see the truth of the statement I started with, that the subject embraced more than at first we might be led to suppose. The time would fail me to consider separately these different systems, I will therefore merely glance at them.

In Scotland we have five distinct kinds of farming, each quite separate from the other. We have—

1st. The pastoral or grazing farmer, wholly confined to the mountainous and hilly regions, where farming is entirely restricted to the raising of sheep and cattle, and, in some particular localities, altogether to sheep, upon a very large scale.

2d. Then we have another class of farmers very much restricted in their operations, and confined to certain localities; these are called in Scotland the Carse farmers, the name of carse being given to extensive level valleys of extremely rich alluvial clay deposit, chiefly adapted, and in many instances entirely so, to the production of wheat and beans; like some of our western prairies their capabilities for growing wheat year after year seems inexhaustible, but unlike them they require very skilful management, being composed of a heavy retentive clayey soil.

3d. A third class of farmers are those who, in the neighbourhood of cities and towns, devote their attention to the raising of green crops, such as potatoes, carrots, turnips and other vegetables; vetches, clover and other leguminous plants are extensively raised by them, cut while green and sold in bundles to cow-feeders and others in the city, the whole produce of the farm is disposed of, including hay and straw, and neither sheep nor cattle are kept at all. The fertility of the soil is kept up to the highest pitch by manure drawn from the city, by the return carts that were loaded with potatoes and other produce. This is often a very profitable style of farming, and is common enough in our own country near large towns. Of course for various reasons it is neither desirable nor practicable to adopt it elsewhere.

4th. A fourth kind is devoted entirely to dairy purposes, restricted in Scotland to those parts of the country which, from the humidity of the soil and climate, are more favourable for grass than others; in this country, however, we find them indiscriminately mixed up with others.

5th. The fifth system is that usually followed in the grain growing districts of Scotland, and is styled the improved system of mixed husbandry. The farmers of this improved system are supposed to combine all the qualifications for the various kinds of farming enumerated in a greater or less degree, according to the prominence of any particular branch in the individual practice of this system.

Now, before we consider wherein consists the excellence of practical farming in Canada, I must first enquire what is the peculiar system found to succeed best here. What is the system of farming in the County of Dundas? If any of you will tell me what system the farmers of this county pursue, I

will tell you what are the essential requisites to its successful prosecution. But is it not too true, that our farming is better defined as the absence of any system at all.

I will assume that we have no system of farming, properly so called; but that from my own experience and observation the system we ought to pursue is the last I have mentioned, that of the improved mixed husbandry, and I shall narrow down my remarks to what is now, and is likely to remain, the most prominant feature in that system as practised amongst us, and that is the cultivation of the soil for the purpose of raising grain and grass, and the great requisites for this are, a *proper rotation of crops, thorough cultivation, manuring and draining.*

A proper rotation of crops is ~~due to~~ one of those fundamental principles, that are inseparably connected with good farming; and in looking at the present position of agriculture in Canada, or more particularly in our own county, it is difficult to arrive at a correct conclusion as to whether the absence of this feature in our agricultural economy, is the cause or the effect of that absence of any system at all which we have referred to. But from whatever cause it arises, the fact is the same: we do not follow any regular rotation of crops. Now, I do not consider it incumbent on me to prove to you the necessity of this. I would rather demand it as an axiom, commending itself at once to the reason of every reflecting mind.

It is reasonable to suppose that the crops derive their nourishment chiefly from the soil, and that crops of the same sort require and will appropriate to themselves the same kind of food, and that just in proportion to the original supply of the particular kind of food required for the support of any particular plant existing in any soil, will that soil continue to produce and support that plant. And it is quite unreasonable to suppose that any soil, however fertile, should continuously produce forever any one kind of crop.

The medical man opens a vein in the human body, and withdraws a moderate portion of that life giving principle that animates the system, and, at proper intervals, he again, and again, fearlessly repeats the operation. He believes—he knows not how—that nature will reproduce and replenish the arteries with a healthier supply, but were he to omit to staunch the ebbing stream of life, who would express surprise if his patient, gradually enfeebled, should at last sink under the treatment and be beyond the reach of nature's restoring touch. Some of you may point me to the fertile plains of the far west, and ask why there we read of successive crops of wheat year after year, without any perceptible diminution in the fertility of the soil. Let me tell you, the process of exhaustion is surely and rapidly going on, and ere long they will have to deplore with the simpleton of old, that their poor farm gave out, just when it was learning to live upon nothing. And the day is coming when it will require all the skill that science and practice can combine to restore them to their original fertility. As proof of this, let me point you to the once fertile plains in the valley of the Richelieu, once the granary of North America, now reduced to the humiliating position of begging their bread. Look to that tract of country between Hamilton and Niagara, the most beautiful in Upper Canada, long supposed to be as inexhaustible as the prairies themselves. It is now in a position almost as bad: look at the old clearances in our own country, and we come very near the truth when we say, that they are already *drilled out.* The system of incessant cropping is very well for the tenant upon a short lease, or for the farmer who is blind of one eye and cannot see out of the other; but to the man who is wide awake—to the man of good common sense, the principle I referred to, commends itself, as at once reasonable and necessary to ultimate success.

The process of cultivation is carried on by various implements, and by the same implements at various times, and under different circumstances. The plough and harrow are the great mechanical agents employed in cultivating the soil.

Of ploughs, we have in Canada just as many different kinds as there are plough makers—strong presumptive evidence that none of them are of the right kind. In Scotland, on the other hand, we have but one kind, or at least the difference is so trifling as to be quite imperceptible, except to the most practiced eye, whence I infer that it is not far from the right kind, and the nearer we approach to it in Canada it will be the better for us. Having a good plough the practical farmer must learn to be a good ploughman. Now undoubtedly good farming hinges on this point, and this is the very point of all others in which we are the most deficient. We evidently try, not how perfectly we shall plough a given piece of ground, but how much we can *scarify in a day*, and no attention is bestowed to have the work done up in a thorough workman-like manner: it seems to be of no importance that the furrows should be straight, deep, and firmly put together, or that the ridges should be uniform in width to facilitate the operations of sowing and harrowing, or that they should be carefully gathered up into the proper shape; and yet these are all most essential points.

We often hear the assertion that the grain grows as well on the crooked ridge as the straight one. This may sometimes be true; but we not unfrequently find that when a farmer ploughs straight, he also ploughs deep and regular; we find that he has his fences straight, his buildings straight, his deportment is straight—and, at the end of the year his account comes out straight.

The object of ploughing is two fold: 1st. To pulverize the soil and prepare it for the reception of the seed. And secondly, to wage a war of extermination against the weeds. The deeper we plough, we increase the area in which the roots of plants are to spread themselves out in quest of that food which common sense, unaided by science, tells us, is by them communicated to the plant. The depth of ploughing may vary according to the nature of the soil and the crop that is to follow, but we are quite safe in saying that from 7 to 8 inches is the least that we should be satisfied with. Eight inches is as much in most soils as a pair of horses will turn over easily, and when it is desirable to go deeper than this, we must have recourse to the sub-soil plough, which is drawn by two horses, following in the wake of the common plough, and stirring the ground to the depth of eight inches more, without, however, bringing any of the sub-soil to the surface.

The common practice is to use the sub-soil in the course of summer-fallow, or in preparing for green crops, or under any circumstances where the ground is thrown out of ridges into a level state; it is used across the intended ridges at the second last ploughing, and then in ridging up the land the plough is run to its greatest depth, probably 10 or 11 inches, thus bring up and mixing as much of the subsoil as will be considered advantageous with the surface soil. Where the under soil is of a decidedly inferior nature, it is better to stir it up and leave it where it is.

There is a plough invented by our ingenious neighbours, on the other side of the river, that has quite superseded the subsoil on this continent, and is said to be worked with one pair of good stout horses, that is the Michigan subsoil and trench plough—a most effective implement, consisting of two ploughs attached to one beam. By one operation the surface soil is turned over, and the subsoil is brought up bodily and deposited upon the top, the ensuing ploughing thoroughly mixing the whole together. Subsoiling is chiefly beneficial, where the under soil is of a stiff retentive clay, alike impervious to the roots of plants,

the action of the atmosphere, and that heat and moisture which are necessary for vegetation. It may be used in any soil with advantage, but although it does not give the scientific man a moment's consideration, it becomes an all-important question with the practical man, whether or not it pays, and just in proportion as it is found to pay or otherwise, does he use it. Subsoiling and subsoil ploughs were introduced into Scotland by an enterprizing Scotch farmer, Mr. Smith, of Deanston, and although the theory is undeniably correct, yet from the very consideration I have mentioned even in Scotland it is very little used. The greatest benefit derived from subsoiling occurs on stiff clay subsoils, and it has been proved that unless such land has been first thoroughly drained, the subsoiling is not only useless but actually injurious. This will appear evident if we examine the effect produced upon a piece of wet, blue clay, exposed to the action of a dry atmosphere; it becomes a hardened clod, incapable of imbibing the fertilizing properties of the manures applied, and of course incapacitated for affording nutriment to the roots of plants.

I therefore come to the conclusion, that viewed in the light of pounds, shillings, and pence, the expense of subsoiling will prevent its coming into very general use in Canada—nor in our present state of agriculture would I advocate it very strongly.

But I have said that the object of all ploughing is to pulverize the soil and to eradicate the weeds that infest our fields. Now, by keeping in view the ultimate object of any operation, we may often arrive at the end, by a shorter and easier method than by adhering to the old fashioned practices of our grandfathers. Having once brought a given piece of ground into a thorough state of cultivation, by means of good ploughing, draining, and manuring, it may be kept in a highly productive state, with very little use of the plough; indeed we are too apt to think that to get a field into a productive state, all that is necessary is to plough it a certain number of times, and apply a certain quantity of manure; but I hold that ploughing, beyond what is necessary for pulverizing the soil, and eradicating weeds, is decidedly injurious to the soil, by faciliting the evaporation of the valuable gases and juices contained in it; and this is one of the great practical improvements, belonging to the system I have styled the improved system of mixed husbandry. Take for example a field that has been properly prepared and planted with potatoes, or turnips, as the case may be —after the crop has been removed, it was formerly considered good husbandry to plough that field in the autumn, to lay it dry for the winter, and to plough it again in the spring, to prepare it for the seed; whereas now-a-days, it is no matter whether the ground be in ridges or not during winter, the under drains are imperceptibly but effectually at work, and by the filtering process of draining off the surplus water, they are actually rendering the ground porous and accessible to the roots of plants, to a depth far below that attained even by the subsoil plough. All that is necessary then in spring is to freshen up the already mellow soil; this is done admirably by the grubber, an over-grown species of harrow, which scientific men might call an agricultural agitator, drawn by three horses and covering a space of five or six feet, stirring up the ground to a depth of eight or ten inches, and bringing up any remaining weeds to the surface. Here then is an economy of 20 per cent. on the labor of the farm, enabling four pairs of horses to do the work of five under the old system. If our land were drained, the same system would hold good in Canada, but as we are circumstanced, taking it for granted that we have eradicated the weeds by cultivating the crop, our proper course is to plough our land occupied by green crops in the fall, as late as possible, providing every facility for the surface water to find its way off, and in the spring to sow our grain without farther ceremony. The repeated action of freezing and thawing during the last part of winter, leaves

the soil in the finest possible condition for receiving the seed. On the other hand, it is proper for us to plough our stubble lands, as early in the fall as possible, to afford time before the winter sets in for the stubble and other vegetable matter to decompose.

There is however one redeeming qualification in regard to our agriculture, for which, if for nothing else, we may claim credit, and I am bound to accord it, and that is for consistency—O yes, we are very consistent. We pay no attention to any regular rotation of crops; we regard thorough cultivation as a matter of secondary importance, therefore we are quite consistent in giving ourselves no uneasiness at all, either to the accumulation or the application of manures. We are satisfied that the manure is all expended on the farm, and that in some way or other we must get the benefit of it. We do not stop to enquire how the benefit is to come, scientific men will probably account satisfactorily for that, *but it must come.* Now we claim that practical agriculture is a chain, and every link a principle, and if we break one link of the chain, the whole system falls to the ground. It is not only possible but necessary to the success of agriculture, to follow out a system of manuring. I will not presume for a moment that you are ignorant of the benefit derived from manuring, in the abstract. We have spoken of the once fertile plains of the Richelieu; the farmers there, we are told, were like ourselves, ever consistent in the practice of agriculture, but they carried their consistency far beyond us, for instead of spreading their manure upon the field immediately adjoining the barnyard, it was considered a much more dignified course, combining a higher degree of knowledge in the branches of mechanical art and science, to remove the barn from the manure.

As in cultivation, we must first ascertain the object to be attained by manuring, and this is certainly not to enrich one field at the expense of another, but to render every part of the farm alike productive, at least so far as the nature of the soil and other circumstances will admit, because, when we speak of a system of rotation, we do not confine ourselves to any given field, but we infer that every portion of our farm shall, in its proper turn, occupy its proper position in that rotation. The *object* of manuring is to increase the fertility of the soil, and having attained a certain point of fertility, the practical farmer is satisfied, if he can only carry on the system and retain that amount; but to do this requires no ordinary discretion and management on his part; indeed it has become a serious question amongst scientific and intelligent farmers, whether, even with the very best management, the ordinary resources of an ordinary farm, are capable of maintaining the fertility of every part of the farm. If it be true that they cannot do so—and I am not prepared to contradict it—how carefully should we attend to this very important matter. One thing is certain, if we continue to extract more from our soil than the resources of the farm will restore, we are moving backwards, and every step is bringing us to the brink of the precipice, where, if we do not discover our true position, and make an effort to recover our lost ground, we must tumble over amongst the fast men of the present day, who have committed no greater folly than that of living beyond their income. If we do not frequently hear of farmers *failing*, we every day hear of them moving off west, leaving us to draw our own inference as to their motives, and as far as my own observation goes, I have yet to learn that there is any part of the vast continent to the west of us, where the prudent and industrious practical farmer, can more surely, more comfortably, or more speedily attain to a competency for himself and his family than in this very county of Dundas.

In the barnyard we must look for the principal supply of nourishment for the soil, and the first symptom of a better system of farming will be the vastly increased bulk of our farmyard manures. We cannot expect our cattle to consume every blade and stem of the straw we raise, and in the spring to find a

sufficient supply of manure in the yard, unless we are prepared to express our faith in the system of homeopathic dozes. We must find a system that will enable us lavishly to litter our yards with straw, and accustom our cattle to the luxury of wading amongst it knee deep. Instead of feeding them ~~with~~ knee wheat straw for breakfast, and beautiful barley straw for dinner, and scientifically chopped straw for supper, we must introduce a little of the stuff that will stick to their ribs; we must feed out a share of our coarse grains; we must grow roots and give them to our cattle, we may rest assured that we are sending them to the best market by the nearest road. One acre will produce 1,000 bushels of beets, the most nutritive of all roots, at no greater cost than 50 bushels of corn. But in this, as in other things, we must make allowance for circumstances. In this climate we find that, while roots are most advantageously fed to young cattle and sheep, they are altogether unsuited and in certain circumstances injurious to milk cows.

It is here a very natural enquiry, whether cattle should be tied up in stalls or fed in open yards. The advantages claimed upon both sides are so decided as to leave the matter an open question. But as far as any individual is concerned it is very easily set at rest. If we are stock farmers or dairy farmers, unquestionably our policy is to keep as many cattle as we have food for, and to economize that food by tying up our cattle, and adopting every other means we can devise for *diminishing their appetites.* If, on the other hand, we are farming on the system of mixed husbandry, we shall keep no more cattle than are necessary for breaking down our straw into manure—and we shall attain this object at less expense, a great deal less trouble to our cattle man, and in a healthier and more comfortable style to our cattle, by keeping them in well littered and well-sheltered sheds and yards. Having thus obtained a sufficient supply of the needful, the question will then arise, how, by a judicious fermentation, we are to concentrate its properties, improve its quality, and reduce it to more portable dimensions.

If we have once overcome the great obstacle, and provided a sufficient quantity of manure, we must then proceed to apply it to the best advantage, but on this my present limits will not allow me to enter. It might be very interesting to consider the means we have within our reach for increasing our supply of this material, either by collecting what nature can supply us with, such as swamp muck, leaves, and other vegetable matter, lime, ashes, chips, saw dust and such like, or by importing such other special manures as the experience of others may prove to be remunerative.

We are all acquainted with the use and the effect of plaster of Paris, so called. In these days of total abstinence, objections have been made to it because it is a stimulant; but had Father Mathew himself been a practical farmer, I am sure he would have encouraged us in the free use of every stimulant that would increase the production of our soil. If it has the effect of increasing our bulk of hay and straw, it will correspondingly increase our supply of the *fertilizing needful,* which will stimulate the purse, and the purse will stimulate the heart of the wealthy practical farmer to do good to all men as he has opportunity.

In addition to those we have already mentioned we have guano, bone dust, and many others better known in theory than practice, some of them really valuable, and others got up by scientific knaves to catch the poor unsuspecting practical farmer. Of these guano is the most important; discovered about 20 years ago, it is now very generally used in the old country, and immense subsequent discoveries of this valuable fertilzer, have marked out a new era in the Agriculture of the United Kingdom, for to no other cause can be attributed that immense annual increase that has enabled farmers with wheat at 5s. per bushel to pay as high rents as they ever did when it was 10s. An intelligent friend of

mine in Canada has this year purchased 7 tons of it, which cost him $500; we shall obtain the result of his experiments and by applying the infallable test of pay or no pay, we shall satisfy ourselves as to its merits.

If I have thus far carried my brother farmers along with me, I have no fear that they will now differ from me when I come to speak of draining, the last mentioned link in the chain. I shall simply state the object of it, and the effect produced by it, and let some one else tell you how you are to accomplish it.

We all acknowledge the fact, that a certain amount of moisture is necessary to originate and continue healthy vegetation, and that a superfluity of moisture in the soil has a decided tendency in the opposite direction. Now the object aimed at, and attained by thorough draining, is of so important a nature as to provide at once an antidote and a cure for the two opposite extremes. The tile drain is to the soil precisely what the governor is to the steam engine. Land that has been properly drained is brought into a porous, mellow condition, at once impervious to the drouth, and in a highly favourable state for absorbing the moisture that falls upon its surface, which, penetrating to a depth corresponding to the depth of the drain, remains there in the soil to refresh and nourish the roots of plants, and as soon as the soil has imbibed more than nature requires for this purpose, its own spacific gravity forces it into the drains.

The effect of external moisture upon undrained land, is more familiar to most of us. After heavy rains we observe that the surface becomes hardened and impervious to the water, which either remains on the top of the ground until evaporated by the atmosphere, or is quickly carried off by the furrows into the ditch; in the former case the land becomes soured, and immense fissures with open mouth invite the action of sun and wind to penetrate into and carry off every trace of moisture from the soil; in the latter case the land is, as it were, washed, and much of the fertilizing ingredients of the soil is hurried into the ditch. Of two evils we must choose the least, and therefore we unhesitatingly prefer surface draining to no draining at all, but thorough under draining is the great secret of success in agriculture—it is the rudder which imperceptibly controls the motions of the ship. Universally carried out in the old country, it has been adopted in this country to an extent beyond what some of us are aware of, and by consulting the experience of others we shall easily and satisfactorily find an answer to that worn out interogatory, "Does it pay?"

If we wish for information as to the manner in which the moisture of the soil contributes to the growth of the plant, the man of science is at hand and will illustrate it in such a light as will convince the most sceptical, but it is enough for my present purpose that we merely give it a place, the last though not the least important, as one of those essential requisites to the proper cultivation of the soil.

Agriculture in Canada is in a peculiar and singularly interesting position; unlike the densely peopled regions of the old world, where agriculture has grown up with the growth of ages, it here exists in all the stages, which, during the world's wide history, it has ever assumed.

We do not require to move far from home to find ourselves cut off from all traces of civilization, in our own country we may travel for miles through the primeval forest, and save the rough road on which we travel, can see nothing to indicate that the foot of the white man has ever been before us, and if in the distance we discover the blue curling smoke, ascending among the branches, curiosity leads us as we near it to pause and admire the scene. Emerging from his lowly cabin the sturdy pioneer stalks forth to begin the labors of the day, all the modern appliances of art and science are nothing to him, his axe upon his shoulder he feels that he has all he needs—with an eagle eye he scans

the giant denizens of the forest, and selects the first victim that is to fall beneath his blows. He pauses not to enquire of the man of science whether he is to cut his timber when the sap is in the branches or when it is not. He enters into no scientific calculations as to the precise angle of obliquity with which he is to guide his axe, but with a strong arm and a good will he plunges it to the eye at every stroke, the old king of the forest trembles on his seat, and with a crash that makes the woods ring again he buries himself in the snow, in the very spot the woodsman had marked out for him; another and another follow, and in a few years a large portion of the forest disappears, and a wide clearance invites the labours of the practical farmer. But the absence of any fixed system soon sinks the virgin soil, replete with the essentials of fertility, below the level of older countries, and it requires all the energies of the modern practical farmer, the man of good sound education and good common sense, to restore and maintain its fertility.

I have thus taken as comprehensive a view of the subject of practical agriculture, as the limits of an ordinary address would admit of. I have considered the qualifications of a good farmer and the principles which he works upon, and so far from regarding the few remarks I have made as tending to much practical utility, I feel as if we were now just standing on the threshold of enquiry; and that it cannot be better explored, than by individual farmers coming forward, and giving to their brother farmers the results of their individual observations, so that the dear bought experience of one may serve as a land mark to all.

The system I have now advocated is no Utopian or visionary scheme, but one which has been long known and successfully practised, wherever the minds of intelligent men have been devoted to the practice of Agriculture.

I could tell you of an unassuming tenant farmer on the banks of the Clyde in my native land, eminently possessing the qualifications I have referred to—a man of good education, of good common sense, and who is not afraid to put his own shoulder to the wheel, surrounded by wealthy landlords possessing all the advantages of a highly finished and scientific education—who has attained for himself the enviable appellation of the "model farmer." And I could point out many in our own country and hold them up to you as examples of successful industry, who will tell you that the nearer they have approached to the system I have mentioned, the greater has been their success.

Nature has done much for us—science has grappled with, and triumphed over the obstructions of nature,—the rest, we must do ourselves. It is often vauntingly said, this is a great country. Undoubtedly it is a great country; but we have yet to learn to be a *great people*. Possessing all the advantages of a good system of education, let us endeavour by every means we can devise, to create a universal thirst for knowledge.

In the numerous mechanics and tradesmen of our rising towns and villages, we have a class of fellow citizens, whose information must flow to them through a different channel than that of our Agricultural Society. Why not establish a Mechanics' Institute, with a library and reading-room attached, in Morrisburgh, or in Irroquois. I am told it is too soon; but can it ever be truly said to be too soon for the philanthropist to assist in providing a higher and more rational amusement for our young men than can be found in the bar room or the saloon, or at the gaming table, or any of those other infamous dens of vice that infest our towns and villages.

Let us then rally round the standard of our Agricultural Society; laying aside all distinction of party, of sect or of country, let us meet on this common ground and unite in measures for the common good.

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