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THE FARMER AND MECHANIC,

Devoted to Agricultural, Horticultural, Mechanical, and Domestic Subjects.

Vol. I. TORONTO, CANADA WEST, FEBRUARY, 1849. No. 5.

The Cultivation of Flax and Hemp as preparative Crops for Fall Wheat.

From articles in our former numbers, the readers of "The Farmer and Mechanic" are doubtless aware that its Editor and Compiler is strongly of opinion that summer fallowing land, as a means of preparing it for fall wheat, may be almost, if not entirely, dispensed with, without operating prejudicially to the land. By repeated experiments, and closely observing the practice of many of the best farmers that can be found on this continent, this opinion has been maturely and carefully formed. It is likewise believed, that by adopting the course of farming submitted for public inspection in this Journal, that the land will annually improve in quality, and at the same time yield much larger returns, at, at least, a third less cost, than what are realised by the systems—if such they may be called—that are in general practice. The incredulity of mankind is such, that it is not likely many will be disposed to at once countenance so strange a doctrine. The views entertained by the writer, as has been shown by what has already been published in this Magazine, will be clearly and forcibly expressed, so that those who entertain different views may comprehend what has been advanced, and an opportunity will be given to all who take exceptions to our arguments, so that what can be said for or against the two systems may be published, for the benefit of the general reader. A fairer proposition than that of inviting free discussion, when a question of such vital importance to the country as the one alluded to, is to be discussed, cannot be made. It must not be taken for granted, that any farmer, no matter how abundant his capital, broad his fields, and diversified his soils, can put all in practice, that is advanced by those who have charge of the Agricultural Press; but, nevertheless, it is well that every individual who obtains his livelihood by the plough should have a thorough knowledge of every branch of his business, whether he be prepared to practice them all or not. With this explanation of our intentions and objects, which shall be more fully developed in the future papers that we propose to prepare on the various modes of conducting the operations on the farm, by which the expensive practice of making naked summer fallows may be avoided, without curtailing the profits of the farm; we shall advance a few reasons why the cultivation of flax and hemp might be grown upon a very large scale in this country, as prepartive crops for fall wheat, or as substitutes for a naked fallow. As these remarks are written by a practical farmer, who *practices* and understands what he *preaches*, they will assume an appearance of written directions to those who may not be so well acquainted with the subject as the writer supposes himself to be. To prevent confusion to the reader, as the mode of cultivation of the two plants differ, a few brief directions will be given under their respective heads:—

CULTIVATION OF FLAX.

An acre of land in Canada will yield twenty bushels of seed and four hundred pounds of marketable fibre. The seed is worth one dollar per bushel, for the purpose of being manufactured into linseed oil, and the fibre will command ten dollars per 100 lbs. if of a fair, good quality, to be exported to Great Britain, for the manufactory of linen. Thus the produce of an acre of this crop will yield sixty dollars, one-half of which will be costs, and the other half profits. Thirty bushels of seed and six hundred pounds of fibre have been repeatedly harvested per acre in this country; but an average beyond that first mentioned need not be expected, unless under very favourable circumstances.

The flax plant requires a very deep, rich, well cultivated clay loam,—a soil, in fact, which would be sufficiently rich to produce from eighty to ninety bushels of oats per acre, by two or at the outside three ploughings, in a favourable year for that crop. Many run away with

the idea that flax does not require a rich soil, and that once ploughing is as good as thrice, and also that three pecks of seed is sufficient for an acre. After a long course of experiments, upon a very large scale, with this crop, the editor can confidently state that it is useless to expect a good paying crop unless the land be remarkably fertile and in a high state of cultivation, and it is also necessary to sow from six to eight pecks of seed per acre.

The best preparation of land for flax is an old broken up meadow, which had previously been cropped with oats or pease. These are common in the new townships, especially as it is there the common practice to sow down the land with the cultivated grasses with the first crop, and in the lapse of eight or ten years a large proportion of the hard-wood stumps may, without much difficulty, be extracted; and as soon as this can be done, the land should be ploughed either late in autumn or very early in the spring, to be sown with oats or pease. If it be intended that the second crop should be flax, directly after harvest the land should be ploughed, so that it may have a second furrow just before the setting in of winter. In the spring, another ploughing should be given as early as possible; and that, with the harrowing that will be required to bring the land into fine tilth, will be all the cultivation that would be requisite to give a very large return of flax. Early sowing is important, as it affords time for the roots of the plants to strike a good depth into the ground before the sun has sufficient power to seriously injure the plants. In this northern climate, about the 25th of April is a suitable period for sowing flax. But as seasons vary, and as there is also from one to three weeks difference in the climate between the extreme Western and Eastern portions of the Province, a better guide to denote the period for sowing will be found by making it a point to sow just when the indigenous or common red plums begin to show blossom. Earlier than this might expose the crop to damage from spring frosts, and any delay after that period would be prejudicial to the crop, both in point of quality and quantity, of seed and fibre.

If a liberal quantity of seed be sown, say seven pecks per acre, and the soil be in a rich and clean state of cultivation, it will not require more than one ploughing after the removal of the flax crop, to prepare the ground for fall wheat. Flax, when sown thick upon a good soil, will prove a thoroughly smothering crop to such weeds and grasses as would be injurious to the wheat. Indeed, upon such a soil, fall wheat will prove a more abundant crop than after a naked fallow: which result repeated experiments have satisfactrily proved.

Where root crops are pretty extensively grown, it would be found that flax might be made to follow in rotation, with much advantage and profit, as a preparative crop for autumn wheat. The manure applied to the soil for the potato, turnip, and other root crops, would pretty thoroughly undergo decomposition before the flax crop would have taken root, and at the same time its properties would not be so much exhausted by the root crops, as to lessen the yield of flax. Unfermented barn yard manure is not suitable for this crop, and where it cannot be made to follow an old clover or timothy sod, as already described, it should be sown after a crop, for which the land had been liberally manured. If neither of those preparations can be had, then the richest and most highly cultivated portions of the farm should be selected for it; and when the plants get a few inches above ground, a top dressing of salt, gypsum, house ashes, and soot, may be applied in about equal quantities, at the rate of four bushels per acre. The house ashes might with advantage form a much larger proportion of the mixture than the other ingredients. The object in sowing it after the plants are up, is, to expel or destroy any insects that may infest the crop: where these do not exist to a serious extent it may be applied at or about the same time that the seed is sown. A top dressing, such as is here recommended, would probably add one-third to the produce of both fibre and seed, and, besides, the ground would be greatly benefitted for the wheat crop, by being thicklycovered with a thrifty growth of plants, by which weeds and grasses would not have a chance to take root and grow.

The business of pulling a crop of flax is rather a serious one in a thinly settled country like this. One rood per day is a fair average

day's work for a man, when the binding and stocking is also included. As it is work that may be done by labouring women and children, where such can be had, there will be found no difficulty in getting it done by contract, at three dollars per acre, exclusive of board and lodging. A machine, to be propelled by horse-power, has been invented for pulling flax, in the neighbouring States, which will, without much difficulty, pull from three to four acres per day. This machine will require a man and a boy to work it, and will cost from £9 to £10 to construct it.

The seed is both difficult and tedious to thrash, when the saving of the fibre is intended. An able-bodied man will not thrash more than six bushels per day; and when given out by contract, including cleaning or winnowing, the usual price paid is ninepence currency per bushel. A machine for thrashing flax can be constructed to be driven by four horse-power, by the use of which four hands will average from forty to fifty bushels per day collectively. If the seed is thrashed by the treading of horses, a man will find no difficulty in thrashing twenty-five bushels per day. But in this case the fibre would be wasted, which, under proper management, is much the most profitable portion of the crop.

An experienced flax-dresser will break and scutch, in a day of ten hours, twenty pounds of marketable flax, or at the rate of two pounds per hour. This is usually, and the most profitably, performed by contract, for both parties, the usual price given being from 2d. to 2½d. per lb. If the most improved machinery be employed in preparing the flax for market, it need not cost more than 1½d. per lb. The expense of rotting, drawing to and from the fields, and the whole work from the time it is thrashed until it is ready to be put on the brake, will not exceed three-farthings per lb. It therefore will be seen that if the whole work be done by hand, by an experienced flax dresser, one who turns everything to good account, and who understands the business in all its departments, that a good article will cost 3d. per lb. to get into market, and that it will be worth just double that sum to be exported.

The seed will [illegible] expense of cultivation, rent of land, [illegible] &c., and leave a profit of fifty per cent; and, as has been shown, about the same profit will be realized from the fibre if, it be got out in a proper manner. From the foregoing calculation, it has been pretty clearly shown, that although the flax crop is an expensive one to cultivate, yet it will give a profit of at least fifty per cent. on the capital invested. It will certainly do as much, and a great deal more, than we claimed for bastard fallows: viz., that the crop sown as a preparative crop for wheat, would, in an average of cases, pay the entire expense of cultivating the land, including rent and managing both crops. Flax is rather an exhausting crop on land, and as it gives no return to the soil, it should not be sown more than once in eight or ten years upon the same soil. On good flax and wheat land, it is quite safe to calculate upon thirty bushels of fall wheat per acre, and the crop is almost certain to come in early and escape the rust, and consequently the sample is apt to be fine and good in quality.

CULTIVATION OF HEMP.

Hemp delights in a still richer soil than flax, and when it is not intended to allow the seeds to ripen it may be grown for a number of years in succession on the same soil without a diminution of crop. It is not safe, however, to practice so severe a system of cropping the land with this or any other crop, unless it be on rich alluvial bottoms. It is on such soils where hemp can be the most profitably grown, and the average yield of marketable fibre may be safely reckoned at from eight to to ten hundred pounds per acre. To have a good fibre, the crop should be harvested before the seeds are formed. Two bushels of seed per acre will not be found too much in an average of cases; and if the soil be rich, and in a high state of culture, it will be a complete smothering crop, and the ground will be as clean, if not cleaner, than if it had been expensively summer fallowed. An acre of hemp will yield in seed from thirty to forty bushels per acre, but the fibre is worthless for exportation, and can only be used for inferior purposes, for domestic use, when the seed is saved. Hemp seed is worth from one to two dollars per bushel, but the demand, being limited in the extreme, could be supplied by half-a-dozen respectable growers, and therefore it is

scarcely worth taking into account. When the seeds are allowed to ripen, the ground becomes seeded with hemp, and it will require two or three succeeding crops to thoroughly eradicate it, and, besides, the ground is in a very unfit state for fall wheat. When the seeds are not allowed to ripen, there is no danger of the land being seeded with the crop, and as soon as it is removed off the ground, a single ploughing will prepare it properly for fall wheat.

Hemp may be profitably grown upon high, rich ground, but it will require at least thirty two-horse waggon loads of barn-yard manure to ensure a full and heavy crop. It is much less difficult to cultivate hemp than flax—the ground should be tolerably clean, and abundantly stored with decomposed vegetable substances. If land of ordinary quality, such as is usually termed good wheat land, be manured at the rate here described, and be also ploughed in a proper manner, in autumn and spring, an average yield of fibre equalling 800 lbs. may be confidently expected. Two bushels of seed per acre will not be found too much, and, indeed, a greater quantity will in most cases improve the staple without seriously affecting the average product. The stems should not be much larger than an ordinary pipe-stem, and the height should not exceed six feet.

It is not possible to summer fallow ground with a view of cleaning it more effectually than can be done by sowing it with hemp in the manner here laid down. When it is intended to sow wheat after hemp, no seed should be allowed to form, and the crop in this case may be harvested about the 20th of August. The land will rarely require being ploughed more than once for wheat, and the only danger that may be apprehended on many soils, in this northern climate, is, that it will be in too fine a tilth for autumn wheat. The hemp crop will absorb the rank properties of the manures—those that are favourable for a strong and abundant yield of straw, and having passed through its various stages of fermentation, will be in a proper state to secure a healthy growth to the wheat plants.

A labouring man who thoroughly understands the managemement of hemp will readily realize, on an average, one dollar per day in preparing the fibres for market, including harvesting, rotting, and dressing—provided that he be paid at the rate of two dollars and a half per one hundred lbs. for the fibre, after it is put into bales, in a fit state for exportation. A medium quality of hemp is worth six dollars per 100 lbs., for home consumption, and five dollars per 100 lbs., for exportation to the mother country. Supposing the yield to be 800 lbs., at five dollars per 100 lbs., a net profit on the foregoing calculation will have been realized sufficient to pay the entire expense of managing required for both the hemp and wheat crop.

The subject at the proper season will be resumed, in the hope that it may be productive of good to our farmers and country.

Rotation of Crops.

A scientific rotation of crops is essential to a good and profitable system of husbandry. The successful cultivation of the soil depends very materially upon the manner in which the farmer performs this difficult part of his business. A wrong arrangement of crops will assuredly produce unfavourable results, and hence there is a positive necessity for a more thorough knowledge of this complex and somewhat intricate subject being obtained by our practical farmers. Although the principles which form the basis of a proper rotation of crops lie at the very foundation of good farming, yet very few have made themselves acquainted with those principles, nor do we find a willingness on the part of any to enlighten public opinion regarding the influence they have upon the crops of grain, grasses, and vegetables grown in this new country. About a century has elapsed since a rational rotation of crops attracted to any considerable degree the attention of the best cultivatiors of the soil in Great Britain. In testing the value of this mode of improvement on the various and almost endless variety of soils, in connection with the numerous field and garden crops cultivated in Britain, it was found that the vegetable, like the animal kingdom, required certain descriptions of food to bring their species forward to perfect maturity, and that each plant possessed peculiar ingredients essential for its full development,

which are absorbed from the soil, by the rootlets, and which in process of time become exhausted by frequently cropping the ground with the same plants, which must again be restored to the land by manures or by the application of other modes of improvement, in order that plants of the same kind can be profitably cultivated. This discovery, by far the greatest for the human family that attracts attention at the hands of the man of science of the present day, is yet far from being completed, nor do the practical farmers avail themselves, as they might do, of the facts that have been elucidated by the experiments made by practical and scientific chemists, all of which have gone to prove the necessity of adapting the crops to the character and condition of the soil upon which they are cultivated.

Agricultural societies might do much towards making this subject attractive to those who have heretofore given it comparatively no consideration; and if only a small sum was annually set apart by each society for prize essays on the best systems of rotation of crops, within their several circles of influence; and also a small sum for the most scientific course of cropping the land, being practically carried out and extended over a period of at least five years, most favourable results would doubtless follow from such an enlightened practice. An interest of such vast importance as this requires all the assistance that can be employed in its favour. Individual and voluntary aid should not be relied upon, when any great result is required to be achieved. Well organized and corporate bodies are in being, in the Province, which might, with a very little exertion, effect vast changes in the condition of its agriculture; and portions of the country that are either naturally noted for their unprofitable agriculture, or have become such by inferior cultivation, might be made to yield three or four times the produce they do at present, simply by the introduction of a more scientific course of rotation of crops. Let the Canadian farmers once be taught the necessity of suiting their crops to the condition and quality of their land, and give them thoroughly to understand the principles upon which a well regulated farm practice is grounded, and our word for it, there will then be no occasion for raising the "hue and cry" *of hard times*; nor will there then be any difficulty in exporting sufficient produce from the soil to pay for the annual imports of the country. Land that annually produces only an average crop of fifteen bushels of wheat might, without much difficulty, be made to produce forty bushels per acre. Such a result as this successfully achieved over a breadth of a few hundred thousand acres of the best wheat lands of Canada, for the next five years, would go a long way towards liquidating the individual and commercial indebtedness which at present has assumed such a threatening and truly formidable aspect. To an inland country like Canada, where capital is scarce, population scattered thinly over a great breadth of country, and where the people are not distinguished for their skill nor enterprise in manufactures, its agriculture is of the first importance. All other interests being dependent upon it for support, should occupy a position on the scale just in proportion to their several relative merits. This, however, is rather straying from the subject under consideration, and the remark was made in this place to show that in order to make great achievements in agricultural improvment it is necessary to make the movement a fashionable and popular one; and to do this effectually, in a country where the great mass of the population have scarcely received an ordinary common school education, the work must not be left to the action of individual effort. The General Government, the Municipial Councils, and the Agricultural Societies of the country have each a portion of the work to perform. The only way by which the country can receive permanent relief, or be extricated from its present financial embarrassments, is by the improvement of her agriculture. Auxiliary aids may certainly be employed, but, after all, they will prove of small moment when compared to what is obtained from an enlightened system of agriculture. Hence the necessity of diffusing among the mass of cultivators a thorough knowledge of the principles which govern their ancient and honourable profession.

Although it is unwise for the government of an agricultural people to allow great questions, like the one under discussion, to be treated

with silent indifference; yet, it can scarcely be expected otherwise, so long as the leading and most intelligent farmers themselves do evince so great an amount of apathy in matters pertaining to their best interests. In another portion of this paper, favourable mention was made of the plan of constituting District Councils into Boards of Agriculture. These Boards of Agriculture, by a little aid from the General Government, might, without much difficulty, establish each an experimental farm, on which the various experiments requisite to prove to the farmers of Canada the advantages to be derived from the adoption of a scientific rotation of crops could be made; and their results published, with other equally interesting and valuable experiments, would form respectable appendages to the literature of the country, and would thus bring within the reach of all a thorough knowledge of the most recent improvements made in agriculture. The farmers of this country do not feel disposed to make experiments, although they be even on a small scale, and those that are made, are rarely, if ever, reported for the benefit of the public. This is decidedly an evil of great magnitude, and one which should be remedied, if possible, with the least delay. When the present circumstances of the country are duly considered, it is pretty clear that large expectations of this kind from Government will not for some time to come be realised. It would be well, however, that a start in the right direction should be made; and to do this on an efficient scale, a small appropriation might be made to each District, for the purpose of establishing experimental farms. The small sum of £150 to each District would secure this object, upon the condition that an equal amount be paid for a like purpose by the District Councils of the country. For the sum of £300 per annum an arrangement might be made with an intelligent farmer, in a central and commanding portion of the District, by which a certain annual scale of experiments should be made in the practice of husbandry, in the management of stock, &c.; the results of each, with a report of the farm management in all its details, to be annually furnished to the Council, or Board of Agriculture. In addition to this, for the foregoing sum, a very respectable school for the training of farmers' sons in the higher branches of education, adapted, of course, to the profession of Agriculture, might be sustained in connection with the experimental farm, in each of the districts of the country. Mention is made of this subject, in this place, simply to prepare the mind of the reader for a more clear exposition of the whole matter in detail, which will probably appear in the March number of this Magazine.

By the foregoing introductory remarks, the reader, at a single glance, will perceive that the subject under discussion is one which, in point of comparison, is second to no other, to the practical agriculturist, who is anxious to be made acquainted with the causes that produce the effects which develope themselves during the various stages in the growth and maturity of plants and vegetables. It may, indeed, be styled the subject of subjects, if the term is admissable, to the practical farmer; and hence the necessity of illustrating it in all its bearings and ramifications, in a clear and conspicuous manner, so that those who read may understand the views and principles expounded by the writer. This mode of treating the subject will be practiced in the hope that it will lead to a more perfect and complete method of illustrating subjects of this kind, partaking somewhat of the nature and principles of the one described to be under the patronage and control of District Councils. As there are an almost endless variety of influences that bear to a greater or less extent upon the style of conducting a rotation of crops suited to the soil, distance from market, character of climate, and the circumstances of the farmer, an elaborate description of each can scarcely be expected within the narrow limits given to articles of this kind, in Agricultural Journals. But, as a series of papers will appear, embracing the various features of this subject, in the succeeding numbers of this volume, the matter will be elucidated with as much clearness as the space allotted for this purpose will allow. For convenience sake, the order of the rotation shall be numerically divided, and remarks appropriate to each will be given.

Two Course, or Shift System of Rotation of Crops.—On soils that contain a very liberal supply of phosphate of lime and potash, wheat

and clover, or wheat and pease, may be profitably grown for a long period of years. Probably one-tenth of the wheat lands in Western Canada would warrant a severe course of farming like this; but, to keep up the condition of the soil with any degree of certainty, the manure made on the farm must be regularly applied, in a suitable condition, to give a constant supply of the requisite food for the plants; and, also, to act mechanically upon the latent properties of the soil. By gradually deepening the soil, from an average depth of five inches, to that of ten or twelve inches, on most of the clay soils, or those in which the subsoil contains a large proportion of clay, phosphate, and carbonate of lime, and potash, a heavy growth of wheat and clover may be taken from such a soil, as alternate crops, for a very long period of time, without in the slightest degree affecting the average yield. A portion of sand in the soil, say twenty per cent., would not seriously affect a rotation of this kind, but would rather tend to give strength to the straw, and would keep the active soil open and free for the speedy escape of superabundant moisture. Of course, where cropping of this kind is practiced, the fact must not be forgotten, that full-grown and healthy plants extract from the soil annually, a quantity of certain ingredients, and when those ingredients are exhausted to that extent that the plants begin to assume a sickly or stunted growth, then the only inference that can be made is, that the rotation must be changed, so as to bring into action other ingredients of the soil, that was not required by the crops previously cultivated. To form correct conclusions regarding matters of this kind, the farmer, by right, should possess a knowledge of agricultural chemistry, and in the absence of an acquaintence with that useful science, the judgment must be brought into close exercise, so as to form correct estimates of the condition of the soil and its productive powers, adapted for the peculiar crops intended to be cultivated.

In growing wheat and clover alternately upon the same land, for a long period of time, much pains will have to be taken to prevent the soil becoming foul with weeds and wild grasses. This will be somewhat difficult to do, as neither of the crops can be horse-hoed; but, by using a liberal amount of seed, both wheat and clover plants will so thickly cover the ground that this object will be partially attained. It is not, however, wise to depend upon such a contingency, and to retain thorough cleanliness to the ground, the cheapest and most efficient means of securing that object would be found in delaying the breaking up the clover sward until the month of July, or just before wheat harvest, of its second year's crop. The number of crops of clover cut, or whether any are cut at all, should depend entirely upon the strength and condition of the land for the wheat crop. If the soil be rich, a crop of hay and clover seed may both be had the first year, and the second year pastured until the first of July, or up to the period for ploughing; if it be only moderately rich one crop would be sufficient, which might consist of either hay or clover seed, or part of both, as might be required; and during the remainder of the period, if possible, the ground should be pastured with sheep, as those animals more equally distribute their droppings over the land than any other stock; and if it be rather poor, and a crop of hay is required, in addition to a liberal dressing of gypsum, which by the way should always accompany a crop of clover, a dressing of barn-yard manure should be given sometime during the growth of the clover crop. The sooner it can be given the better for the clover plants; and if a supply could be had for that purpose, the best period would be found in the autumn, or as soon as possible after the wheat crop is removed from the ground.

In breaking up the clover sward soon after the removal of a crop of hay in July, if it is practicable to delay the ploughing until three or four inches growth of young clover covers the ground, the wheat crop will thereby be improved. One thing however must be observed; viz., that the breaking up of the clover fallow must not be driven so late as to risk injury being done, by not giving sufficient time to decompose the inverted sod. A clean clover and timothy soil, if it be thinly ploughed, will thoroughly undergo decomposition in about five weeks, in midsummer, but if there be any wild grasses—especially couch grass—a longer time than this will be required to effect that object.

It is understood that the first ploughing must be done with a light furrow, and the second and last furrow should be ploughed very deeply, and to perform which, the power of at least three strong horses will be required. When the seed furrow is ploughed deep—say, from ten to twelve inches, the seed should be sown early, and a much greater quantity is required than if the depth of furrow be only four or five inches.

The quantity of seed should in most cases equal from seven to eight pecks per acre, when sown broadcast, and if drilled in rows, a reduction of about twenty per cent. may be made, and a still greater reduction when it is the intention to horse-hoe the wheat, which, by the way, cannot be done in alternating wheat with clover. In this country, and indeed throughout the entire wheat growing regions of North America, this plant is disposed to be attacked with rust. Thin seeding is apt to be favourable to this disease, which must be accounted for mainly through the tendency that thinly sown plants have tocontinue growingwhen theyshould ripen. If the plants be thin on the ground, they will throughout their entire growth have a dark green and luxuriant, if not an unhealthy or over-fed appearance; and a short time before harvest, unless the weather prove remarkably cool and dry, the crop will be either partially or wholly destroyed by rust. Over seeding land will have just the opposite influence, and would be as frequently detrimental to the crop as would thin seeding. Plants, as has already been argued, require certain descriptions of food to bring them forward to a healthy maturity. If any one principle be deficient, an unhealthy growth must obviously be the result; then, on the other hand, the tender wheat plant, especially, will not endure to be over-fed with stimulating manures; and where this is done, unless some powerful counteracting influence be employed, disease will invariably follow. Therefore, it is wise to so regulate the quantity of seed, and the amount and qualtity of manure applied to the soil, in such a manner, that the largest possible yield shall be obtained, without endangering the plants from being attacked by disease. No specific rules can be laid down, which would in all cases and on all soils produce alike favourable results; but, when the farmer becomes so sufficiently acquainted with the science, if it may be so called, of his profession, he will then more clearly understand the true causes that produce the effects, that develope themselves in his varied pursuit; and in process of time favourable results may be confidently relied upon.

Alternating wheat with the pea crop possesses advantages that cannot be obtained by the method just described. It would be well to duly consider their merits, before a decided preference should be given to either. In a period of twelve years the former method will give four crops of wheat, and the latter, during the same period, six crops. When the clover plants follow in rotation after wheat, neither of the two crops can be cleaned by the use of horse-hoes; but when the pea crop is employed as a preparative crop for wheat, both may be hoed, and the ground thereby made to be as thoroughly clean as if it had regularly undergone the expensive process of a naked summer fallow. This advantage cannot be too highly estimated, for no system of cultivation should be favourably received, that did not secure to the land perfect tilth, and cleanliness from noxious weeds.

Supposing that two such hoeings be given to each crop, the entire expense would not exceed five shillings per acre; and it is quite certain that a much heavier growth of straw and grain would thereby be secured, and, besides, the land would yearly improve in cleanliness. In some instances, the soil being very foul by slovenly cultivation, might be found difficult to bring into a thorough state of culture, without giving it the benefit of a naked fallow. If this expense can be dispensed with, without incurring any perceptible falling off in the average yield, it would certainly be unwise to continue the practice. There are many ways by which it may be profitably avoided, some of which have already been illustrated in the columns of this Journal. The great object of naked fallows is to thoroughly clean the ground—any system that will secure that end at a less expense, and at the same time afford larger returns of grain, deserves a favourable consideration. Horse hoeing both the wheat and pea crop in the manner described, will, in most cases, accomplish such a result; but there maybe instances in which it would be found to fail, in keeping the ground

in a perfectly clean tilth, when extended over a long period of years. If such should be the case, a very cheap and reliable plan of cleaning the land may be found in the use of a paring plough, to be employed on the stubble, directly after wheat harvest. Paring ploughs for working stubble land may be made upon a very simple scale. They should turn a furrow eighteen inches wide, by three inches in depth; a less depth than this would be preferable, provided that it could be turned by the plough. Paring land in this manner, in the month of August, would, in nine cases out of ten, be an effectual means of destroying every species of weeds, especially when taken in connection with the practice of horse-hoeing crops. After being exposed in this manner for a few weeks to the action of the sun and air, the ground may be worked once or twice with a steel tooth cultivator, and a short time before the setting in of winter it may be ploughed with a deep winter furrow.

The foregoing system of growing wheat may be profitably practiced on some soils. It is not here given with a view of recommending it for general practice. Every cultivator must judge of its adaptation to his soil for himself. The principles and deductions laid down will be found strictly correct, when carried out on soils suited to the system. Every man must learn to think and act for himself; but in acting, he should make it a point to thoroughly understand the principles upon which the motive for action are grounded. With such a knowledge of his business, and by adopting the most enlightened practice, he will run but little risk in anticipating a favourable issue.

Facts and Extracts compiled from the American Agricultural Press.

There are now published in the United States upwards of twenty Agricultural papers and magazines, the whole of which we expect regularly to receive, either weekly or monthly, as they are severally published, before the close of the first volume of the *Farmer and Mechanic*. We are already in the receipt of half that number; and, in perusing them, much that is really valuable and interesting to Agriculturists is obliged to be passed over without comment, for want of space in our columns to insert it. To make up, in some measure, for this, we purpose to glean from such sources of information as we may have at hand as many interesting facts as possible, and shall compress them into the shortest possible space, without destroying the sense and harmony of the author's views and deductions. In doing this, the Editor will occasionally intersperse remarks of his own, for the purpose of more clearly explaining the matter, when it is required, and for adapting it to the climate and other circumstances of this country.

DRAINING LANDS.

In the *Genesee Farmer*, for December, the Editor makes some remarks upon draining land, which should be understood by every cultivator of the soil. The views embodied in his article were obtained from an interesting discussion that took place in Buffalo, after the conclusion of the lecture by Professor Norton, of Yale College.

"The objects of draining are two-fold; first, to get rid of any excess of water on the ground, as it falls on the surface of the earth; and, secondly, to remove all excess in the subsoil. Deep tillage doubles the capacity of the soil to hold the water that falls in showers, without injury; and, to that extent, prevents its washing. It is characteristic of poor, thin, hard soils, that a large share of the water which falls upon them in the course of a year runs off immediately. It is indicative of a good soil if it will imbibe and retain much water, diffused so deeply as not to have the surface nor subsoil too wet for cultivated plants. Whatever of the organic and inorganic elements of plants the earth contains in a soluble conditiou, this water will dissolve. The free ascent of water through the roots ond stems of vegetables to their leaves, carrying with it much nutriment, will cause these plants to grow rapidly. To supply a crop with all the water it needs, in a dry season, the earth to a considerable depth must possess a peculiar mechanical texture, adapted to the holding of this liquid in a harmless diffusion. The ag-

gregate supply must be larger than farmers who have never studied solar evaporation are apt to believe.

"With deep tilth and suitable underdrains, where the soil is compact, very little surface draining will ever be required. If mellowing land four inches deep will enable it to absorb a third of all the water that falls in ordinary rain, should not its tillage twelve inches in depth give it power to imbibe three times more, or the whole of the water? The earth, acting as a filterer, all water passed into the underdrains, three feet below the surface, would be as clear as that from the purest springs. As logs and brush in mill-dams, when constantly wet and partially excluded from the air, last for ages, so poles and brush, placed three feet and upwards underground, will doubtless last half a century or more."

HESSIAN FLY.

The same Editor says, on this subject, "That the destroying insect is becoming more and more abundant over the whole wheat districts. They are extremely local, and, when once colonized, do not emigrate far, when they can find the proper subsistance near home. A farmer in Pennsylvania has almost entirely prevented their depredations, by burning over the stubble, directly after cutting his wheat, and before they had changed from a *larva* to a winged state; while fields in his immediate neighbourhood were destroyed by not employing this precaution."

LUCERNE.

"From what we have seen of this plant, often called 'French Clover,' we think its culture for soiling can be made profitable. Its seeds should be planted in drills, by a machine. We have traced its roots thirty-eight inches into the ground. In permeable soils, of fair strength, it grows luxuriously. Deep culture, gypsum, lime, and leached ashes, well mixed, and drilled in with the seed, are recommended by us. If the soil is thin, or poor, stable manure should not be omitted. Seed should be sown or planted early in the Spring. Having deep roots, Lucerne stands dry weather better than almost any other plant."

CORN SHELLERS.

Two engravings of machines for shelling Indian corn are given in the same paper, and the following description, furnished by Messrs. Ruggles, Nourse, and Mason, of Boston, the manufacturers, will enable the reader to form a pretty correct idea of the machine and its capasity:—

"It consists of a horizontal toothed cylindar, six feet long and one foot two inches in diameter. The ears of corn, in the operation, are confined to a part of the upper and rising side of this cylinder, by means of a cast-iron concave, extending the whole length of the machine, and being shovelled or let into the machine at one end, they are driven through, and the cobs discharged at the opposite end, while the grain falls below, being admitted on either side of the cylinder. The operation is governed by elevating or depressing the discharge end, which causes the machine to discharge the cobs fast or slow, and of course operates more or less upon them; thus securing to the operator the power of finishing his work.

"This machine is capable of shelling two hundred bushels of ears per hour. Upwards of one hundred of them have been already sold, and they may be seen at work in New York, New Orleans, and other Northern and Southern cities and towns, where they have given great satisfaction. They are very simple, and strong in their construction. Price, $50."

TWELVE-ROWED BLOOD-RED WHEAT.

A new variety of wheat, with this appellation, has lately been introduced into England. It produces a head six inches long and one inch broad, and has twelve rows of kernels. It is very productive, eighty bushels having been grown per acre. A quantity of eighty bushels of this variety of wheat is on its way to the United States.

WIRE-WORMS.

A Correspondent, in the same paper, asks questions regarding the most effectual means of getting rid of these destructive pests, to which the Editor purposes to reply in an early number. From a former Correspondent, it appers that two successive crops of buckwheat have generally proved efficient in destroying the wire-worm, on land previously overrun with them. As fall ploughing would doubtless prove of great benefit, would not land thus ploughed, and sown with buckwheat about the

middle of May, and ploughed under when in full bloom, and again ploughed before sowing the wheat, be quite as efficacious a method as the one first alluded to? The latter course combiding, as it does, the advantages of a horough summer fallow wit keeping the ground covered with a crop growing so dense as to smother almost entirely all grass and weeds, would probably starve the wire-worms out.

Township Agricultural Societies.

An opinion is gaining ground by many that Township Agricultural Societies should no longer receive a portion of the Government appropriation, and that the whole should be placed under the control of District Societies, so that much larger premiums may be awarded than is done at present. As this subject has already been freely discussed in the *Farmer and Mechanic*, it may not be thought necessary to recapitulate any of the arguments that have been advanced, to show the importance of sustaining those local Institutions. It, however, does appear the proper time to urge upon all who are interested in the prosperity of Canadian Agriculture to employ all the influence in their power in the support of Township Societies. If an organization is to be kept up, for the purpose of building up a superior character for the Agriculture of this country, a foundation must first be substantially established in the Townships. When that object is once well secured, there will then be little or no difficulty in concentrating the efforts of larger masses of society, for executing a more enlarged scale of operation.

District Societies are essentially necessary for the annual concentration of the choicest products of the District; and so is the Provincial Association of still greater importance for securing the same end, on a more extended scale. But, as has been previously stated, a spirit for improvement must first be created in the smaller sections of the country. It is very questionable, indeed, whether it be possible to arouse the latent energies of our farmers to prosecute any improvements on an enlightened scale by the plan of simply awarding prizes at the Fairs or shows. Before much can be efficiently done, the mind of the mass of cultivators must be informed regarding the improvements made in their own and other countries. In the accomplishment of this object, one great point is gained by the assembling of farmers at those exhibitions. They have not only the opportunity of comparing their various articles of merit, with a view of deciding in their own minds of their several relative good or bad qualities, but at the festive board a fitting time for liberal and free discussion is presented. Those dinner-parties should partake, as much as possible, of the character of an intellectual feast, which very seldom happens in this country. This salutary improvement may be brought about within a very few years, by supplying the members with a spirited Agricultural Journal. Besides this source of imparting a large fund of useful information to the practical farmers, it would be well for each Society to make it a practice of awarding a certain number of premiums in the modern works on Agriculture, Mechanics, and Horticulture. When our farmers once arrive at that state of advancement that they generally make it a point to consult the best authors on the science and practice of agriculture, as do other classes of Society, in regard to matters connected with their several avocations, then may we hope to see the officers of Agricultural Societies, whilst awarding and distributing their rewards of merit, demand from the successful competitors a full and detailed account of the mode, and expense, by which they brought their articles or stock up to so high a standard of excellence. It may also then be expected that Agricultural dinner-parties will be conducted in a more rational and intellectual manner than what is usually now-a-days practised; and the speeches, the plain recital of facts, and reports of experiments made by those who favor such Societies with their presence at the festivals, when published by the local press, will tend to impart a popularity to movements of this kind, that cannot by any other means be so cheaply and completely effected. Mankind, at this

enlightened age, are much disposed to be parsimonious, both in the expenditure of time and money; and unless there can be real matter of fact benefit derived from the operations of Agricultural Associations, to its members, the great mass of Society will, with much difficulty, be prevailed upon to contribute anything towards their support. It is quite clear that the chance of obtaining much advantage from the distribution of prizes, when a very large number become competitors, is a matter of much uncertainty; and, therefore, unless the plan of supplying the members of Societies with a cheap Agricultural Journal, through which all will receive full value for their annual subscription, whether they be successful or unsuccessful competitors, be adopted, it will not be possible to enlist in the cause so great an amount of influence and talent as might be done, by this means. The great object to be attained by the establishment of Associations for encouraging improvements in Agriculture is, to cause, to the greatest possible extent, the increased productions of the soil and workshop. any auxilliary that can be brought to their aid, which will facilitate the attainment of that important result, should be employed: and there can scarcely be two opinions regarding the powerful influence that such publications have, in stimulating the farmers to make valuable improvements in their useful calling.

The season has now arrived when it is usual for Agricultural Societies to make a pretty general canvass for subscriptions; and it is to be hoped, in the present embarrassed state of the Province, that greater exertions will be employed than have ever been, for the improvement of our Agriculture. By placing in the hands of our farmers good, sound, practical advice, such as is found in Agricultural papers, it unquestionably will follow that the spirit of improvement will take possession of their minds; and within a very short space of time the products and wealth of the country will be greatly increased; and instead of a general complaint of hard times, prosperity and happiness will prevail. We therefore hope that the practice will become general of spreading broadcast through our land as much information as possible on the subject of Agriculture and her kindred Sciences.

The following proceedings of the Township of Guelph Agricultural Society we publish almost entire, as given in the *Guelph Herald*, affording, as it will do, a perfect model for other Societies. There are some points that were elicited during the discussion which will require some comment at our hands, and which will receive attention in our next number.

In the evening a large portion of the yeomanry sat down to dinner in the Farmers Arms,—the President and Secretary of the District Society, R. Jackson and J. Harland, Esqrs., doing the duties of Chairman and Croupier. Ample justice having been done to the good things provided by Mr. Pipe, and the preliminary toasts having been given and responded to with the usual demonstrations of loyalty,

The Judges of the Show was given from the chair, and

J. Parkinson, Esq., returned thanks.—Glancing at the difficulty experienced by the judges in giving general satisfaction, when, as on the present occasion, the number of unsuccessful far exceeded that of successful candidates—he recurred to some interesting "Annals of the Parish" connected with the period when the first public meeting in Guelph to decide on the best route for a road to connect the embryo town with the already partially settled township of Eramosa, was held under the presidency of John Galt, and beneath the canopy of Heaven. Reverting to the failure of the last crop of spring wheat, Mr. P. pointed out the necessity that existed of directing attention to the cultivation of a larger proportion of Fall Crop than heretofore, and to the discovery of some method by which the injury frequently sustained by the young wheat from smart frosts in the "sugaring season" might be obviated, being of opinion that if the artificial "*pan*" caused by the treading of the cattle was broke through, and the soil pierced to a sufficient depth to enable the accumulated water to escape, and the roots to penetrate beyond the influence of the frost, the "*throwing out*" would be prevented. He had tried sub-soiling to the depth of 10 or 12 inches, but the result was a failure to the amount of twenty dollars per acre, the stiff blue clay brought up proving nearly unproductive—although in the succeeding season the soil having become mixed and amalgamated, he had a good crop. His first attempt had not succeeded to his expectation; he was resolved, how-

ever, to continue to experiment until the desired result was obtained.

The CHAIRMAN in rising to give *Success to the Wellington District Agricultural Society*, said that although the Society had been instituted only seven years, the number of entries of stock and produce for exhibition had increased from 50 to 500, while the quality of the articles exhibited had improved in nearly the same ratio.

Mr. PARSONS, in a short eulogistic address, gave the *President of the District Society*, pointing out the large increase in the number of the members, and the rank it held in the estimation of similar institutions, evidenced by several of them having adopted the rules of our District Society.

Mr. JACKSON, in returning thanks, called the attention of the meeting to the scheme he had mooted on several former occasions, which had not been favourably received by the Directors, *but which he stated his intention of bringing* before the general meeting on the last Tuesday of January. It was to the effect, that the funds of this Township Society should be for one year devoted to the purchase and importation of Sheep and Hogs of the most approved breed, in order to prevent the quality of the Stock in the District from becoming deteriorated for lack of approved crosses.

The Unsuccessful Candidates and the Vice Presidents:

CHAS. DAVIDSON, Esq., in giving the *Eramosa Branch of the Society and Mr. Parkinson* —said—The Eramosa Society is making rapid progress in the improvement of every variety of agricultural produce, but there is no part of their improvements equals the exertions made by their ploughmen; and from the opportunity I have had of seeing and examining the ploughing in the neighbouring townships for the last two years, I say that in ploughing, the Eramosa Society is second to none of the others, more especially when you consider that the greater part of those who have competed for premiums are Canadians, and it is not to be supposed that they have had the same chances of acquiring correct knowledge of the art, as Old Countrymen, still they have been victorious in carrying off the prizes; and, Sir, I have made this remark on account of what Mr. Parkinson stated concerning subsoil ploughing being necessary for the better enabling the farmers of Eramosa to grow fall wheat, that by placing a subsoil plough in the hands of ploughmen, who had their occupation at hand, it might be of the greatest importance to the farmers. But, Sir, I disagree entirely with Mr. Parkinson in the views he takes in regard to the advantages to be derived by the crop from subsoiling, and the remarks I am about to make are not theoretical, but practical, and acquired by the loss in three years of about £20 an acre, from trying experiments in subsoil ploughing without drainidg, the land not returning the seed sown; but having furrow drained it the following year, I had 43 bushels of wheat per acre. If, Sir, you will only consider for a moment, that with such a stiff, adhesive subsoil as that mentioned by Mr. Parkinson, you where to run the plough to the depth of 12 or 14 inches, you would only be forming (if I may so speak,) a basin which would retain a greater quantity of water, which from its having no way of escape, would do greater injury to the crop than it did previous to the ground being subsoiled; but, Sir, subsoiling without draining will be found of great advantage when your land is thin and sharp, lying on a porous subsoil, or when from repeated ploughing to the ordinary depth, and by the treading of the cattle, the bottom of the furrows has got so compact as to hold water. By breaking that crust, you would give a greater depth for the roots of the plants to penetrate. And what is *of great importance, a dry, hot summer would* not so soon dry up the moisture. But it is only on such soils, subsoil ploughing, without previous draining, would be of any benefit. nay, as I have before shown, it would be highly injurious. But it might be well here to ask what system of draining can be adopted, to be within the reach of the farmer, seeing that labour is so high in this country; and, Sir, I will state one plan which I have seen practiced, and which answered the purpose, more especially on grass lands; and that is, by taking a plough and turning out a heavy furrow of say 6 inches deep by 9 to 10 broad; then following with a subsoil plough which had long narrow mould boards standing very high, which was held to the depth of 6 or 8 inches. These mould boards cleared the drain to the depth of 12 or 14 inches; then, by raising the mould boards, affixing a narrower sock, and going down the same furrow, at a depth of about 6 inches or more, you had the drain finished. Two men followed, one with a spade, cutting the first furrow into lengths of 15 or 18 inches, the other lifting the pieces of turf, and placing them in the drain with the grassy side downwards, where they rested on the shoulder left by the plough when taking out the last furrow, thereby leaving an aperture of six inches. One field which was so drained, was seeded down, and the drains have acted well for a great many years; and the reason why such a system was not followed to a greater extent, was on account of the moles crossing the drains, more especially when the land was under cultivation, and so obstructing them, that it was found necessary to fill up with broken stones or gravel; but as these *little varmint* are not (so far as I am aware) to be found in this country, I think such a system of draining might be followed with advantage, seeing that the expense of procuring and carrying the material to fill drains is by far the largest item, and which may

here be generally procured on the spot. And as there are many persons present who may not have had an opportunity of seeing and examining the effects of draining and subsoil ploughing, I may be permitted to state that I was present when the Judges were examining the lands of several farmers who where competitors for a premium given for the best managed farm, a field belonging to one of whom I would cite as an example of the benefit to be derived from the system I have just narrated. The subsoil of this field was of a reddish stiff clay, and the occupant had never been able to grow a green crop on it until he drained and subsoiled it to the depth of 14 inches. When it was examined it was in hay stubble, being three years since it had been drained. On digging down to see what effect the atmosphere had produced on it, it was found to be changed, to the depth of 13 inches, from what I have before described it to a fine mellow mould, and at the bottom of that there was found about an inch of dead sand which served as a conductor to carry the water to the drains; and it had another property, that of preventing the cold from rising from the subsoil.

Mr. Davidson afterwards added—There is one thing which I have overlooked. Mr. Parkinson stated that farmers would have to procure some such subsoil plough as was shown at the Provincial Agriculturral Show at Hamilton last year. Now such a plough is very expensive, and can only be used for subsoiling; and Mr. Parkinson may not be aware that the Scotch iron plough which he is in possession of, is capable of being used for subsoiling almost as well as the other (perhaps not going to the same depth,) by merely taking off the mould board and glands.

The Cow—Her Diseases and Management.

Rheumatism of the Loins, or Lumbago.—The cause of this disease is attributed to obstructed perspiration, brought on by colds; and this cause will be more active where the body of the animal is already in a morbid state. The seat of the malady is evidently in the tendons and muscles of the loins which aquire a diseased rigidity and harshness.

The first symptoms of the disease are a loss of milk, attended with fever, costiveness, and loss of appetite. On motion in the stall, the animal reels from one side to the other, and sometimes falls down, as if having no use of her hind legs; she then rises with the greatest difficulty, or cannot rise at all without assistance. When turned loose, she walks with great difficulty with her hind limbs; and, in addition to these symptoms, in the progress of the disease, her skin adheres tight to her body. Many symptoms may also show themselves from a violent strain of the loins, by one cow riding another, as happens in time of heat; but this action may generally immediately be perceived.

The first remedy to be applied, in the treatment of this malady, as in other inflammations, is bleeding, proportioned in its quantity to the violence of the symptoms, and the strength and condition of the animal, say from three to five pints. When the bleeding is over, the following medicines may be mixed together and given, milk warm, in two quarts of water gruel and half a pint of molasses:—

Sulphur, from 9 oz. to 1 lb.: grains of Paradise, (cardamom seeds,) 3 drachms; Saltpetre, 1½ oz.; tumeric, ¾ oz.; cummin seed, ¾ oz.

This medicine usually operates briskly, and will often continue for ten or twelve hours. After its operation is over, the following combination will be proper, mixed together and given to the animal, at one dose, in three pints of mild ale or beer, with a handful of wormwood previously boiled, which dose may be repeated, if necessary, once a day:

Saltpetre (nitre), 1½ oz.; flour of sulphur, 1½ oz.; camphor, ¾ drachms; juniper berries, 1½ oz.; long pepper, ¾ oz.; oil of turpentine, 1½ ounces.

Besides the above, local applications will often be found highly useful. For instance, the following *charge* laid on the loins of the animal, as the weakness appears more in that part than any other; for she can generally raise her fore parts, while the hind ones seem useless:

Black and Burgundy pitch, ¾ lb.; oxycroceum and paracelsus plasters, 3 oz.; bole Armoniac and dragon's blood, 1½ oz.

[illegible] melted over the fire, and spread while hot, but not so hot as to scald, all over the rump, as well as the loins. Some wool or saddler's stuffing, should be stuck on it, in order to keep it in its place. As soon as this is completed, the cow must be [illegible] and put into a sling, made of sacking [illegible] at she may feel the floor with her [illegible] are to be well rubbed two or three [illegible] day. She must remain in this situation [illegible] she can stand of herself, and get up without the assistance of the sling. The disease generally gives way to this practice in the course of ten or fifteen days.

The food and drink to be given during the treatment of this disease may be the same as recommended for other inflammations, such as an abundance of warm water gruel, or mashes made of malt, bran, or Indian meal.

Consumption, or Wasting.—This complaint is generally caused by cold and improper food; the former excites inflammation, and produces ulceration in the lungs; while the latter, by conveying deficient nourishment or nourishment of an improper kind, will produce the same effect. In proof of this last assertion, there are instances on record, of potatoes being given to

cows in excess, and continued for some time, with the view of increasing their yield of milk, the consequence of which was, that, though they gave a greater proportion of milk, they fell into this disease, and were seized with a wasting and a cough. Besides this, where food of a forcing nature is given to the animal, as beets, carrots, parsnips, &c.; for the purpose of promoting the flow of milk, the consequence will be to produce this disease.

The predominent symptoms of this malady, are a gradual emaciation of the body of the animal, or pining away, attended with a slow fever and a cough; but where the appetite is not much affected, the progress of the complaint is generally marked by an attack of looseness, which in the end proves fatal. During the course of the disease, there prevails a remarkable flow of milk, which tends to exhaust the strength of the cow, and consequently the symptoms increase. It may be remarked, however, that this wasting seldom occurs in the country, but is chiefly confined to cows confined to stalls in town, the mode of feeding of which is different from that of those kept in a free and open situation, on different food.

When the first symptoms of this complaint appear, the object should be to prevent, as far as possible, the wasting of the body from going further, to the injury of the animal. She should be dried off immediately, or kept no longer for the purpose of milking. This will be often sufficient to effect a cure. Where the disease is connected with inflammation of the lungs, bleeding, and the same treatment recommended under the head of "Inflammation of the Lungs," at p. 207, is the only plan, perhaps, that can be adopted with success; but when the disease is far advanced, this and every other mode of treatment, as far as known, will be found ineffectual.—[American Agriculturist.

COST AND PROFIT OF RAISING WHEAT AND INDIAN CORN.

A Correspondent, who signs himself Reviewer, in criticising some statements made by the Hon. Mr. Henley, member of Congress for Indiana, that appeared in a previous number of the *Agriculturist*, makes some very pertinent remarks on the costs and profits of wheat growing on the Western Prairies. Mr. Henley states, that the raising of Wheat on the great Western Prairies only costs *twenty-five cents a bushel*. Now, in truth, is this so! If it is, then should we all be tempted to emigrate to that Paradise of wheat growers. True, he does hint that a crop is occasionally blighted; and that considerations contribute to swell the average expense of producing wheat on the Western Prairies to probably thirty-five cents per bushel; that is, of course, delivered in market; for he gives the cost of transportation at two dollars an acre; that is less than 5½ cents for hauling twenty miles. To show this picture in another light, I have corresponded with a wheat growing friend of mine in the neighbourhood of Chicago. He thinks that the distance wheat is hauled into that immense depot will average at least thirty-five miles, at a mean expense of 12½ cents per bushel. From careful examination, my friend is satisfied, that throughout all the region that sends its crop to the Chicago market, the yearly average yield of all the wheat sown will *fall below ten bushels per acre!* The cost of ploughing and breaking up prairie, and all the other expenses connected with the crop, is stated to be $7.50 per acre. What the average price of wheat in that market is, my friend does not give; but supposing it to be 75 cents, the profits upon ten bushels per acre would be easily counted, if all the labour was hired, to say nothing of interest on land. &c.

Keep a Diary.

Every intelligent and careful farmer should keep a record of every important operation on his farm. This is necessary if he would thoroughly understand his business, and avoid errors and losses it its prosecution. We have, undoubtedly, too much *random farming*, where we should have it regular and systematic, and this, for want of that knowledge which might easily have been obtained, if the previous management and its results in each particular case, had only been carefully noted. Such knowledge is oftentimes very valuable to the practical farmer—he cannot well afford to do without it.

How many mistakes have been made and *repeated* from year to year, which would have been avoided from the first, if those interested had only preserved a history of the whole transaction, so that it might be seen in its true light; but as they are unable to bring all the items of expenditure together into the account, they have never seen that the return is wholly inadequate, and so they have continued the practice. The farmer should have the means at hand of ascertaining the profit or loss on every crop that he cultivates, and every animal that he keeps. He will thus be led to devote the greater part of his

time and attention to those which are uniformly most profitabe.

Farmers generally are too negligent in this matter. In no business, perhaps, does eminent success depend more upon the judicious application of the lessons to be derived from careful observations of the past, than in farming; while the farmers as a class are prone to let many of these most important matters pass unheeded and unnoted. How many of our common farmers are able to tell the actual cost of each of the various crops they have cultivated for the past five or ten years? and the average yield of each per acre? And yet the knowledge of these and kindred matters relating to those very crops must be valuable to a sensible and reflective farmer, and would, doubtless, have a favorable and important influence upon his furure agricultural operations.

Perhaps the necessary farm record may be most conveniently kept in the form of a diary. In this every important operation upon the farm should be noted—the state of the weather; amount and kind of labor performed each day; the method pursued in the cultivation and manuring of every field; amount of seed sown, quantity of hay, grain, &c., harvested from each field; income of the farm; expenditures; increase of stock, &c., &c. It should furnish a history of business transactions on the farm sufficiently minute for all practical purposes, in the order of time in which they occur.

In this manner at the end of the year, you have a record of all the expenditures and all the labor performed on your farm for the year. You have also an account of the income, and the yield of every crop you have cultivated. You may then arrange these several items in a more convenient form for future reference, so that you may see at a glance the actual cost of each crop; the amount of labor expended in preparing the land, sowing or planting, cultivating, harvesting, and securing it; also the yield and market value of the same at the time it was disposed of. In this way you may go through with every thing to which you have given any portion of your time and attention. You may thus see for yourself what has been most profitable, and what has been unprofitable; and also what has served to bring about these results.

The great importance of keeping an accurate farm record is apparent. It would require only a few moments time each day to do it; and the cost of a suitable book is but trifling, while the benefits to be derived from such a record are various and almost incalculable.—[Me. Far.

LEAVES FOR LITTER AND MANURE.—Leaves of trees furnishes the best of bedding for pigs. A good thickness of them enables the animal to cover himself completely and he sleeps warm and comfortable under almost any degree of cold They make a good and convenient litter for horses or cattle—readily absorbing the liquid, and at the same time affording a soft and easy resting place for the stock. A covering of them affords an excellent winter protection for plants, and they also make a valuable compost for plants that will not bear the salts of animal manures. A mould prepared by mixing old grass turf and leaves, well rotted, is known to be excellent for many gardening purposes.

CULTIVATION OF THE STRAWBERRY.

The following interesting description of the mode and expense of cultivating strawberries must prove very interesting to most of our readers, as the cultivation of that delicious fruit has of late attracted a good deal of attention, by many of our best farmers and gardeners:—

The result of the following experiment, the first of the kind in that section of the country, was given at the request of the Editor of the *New York Farmer and Mechanic*, by Mr. C. H. Starr, of Groton, Connecticut, who has been engaged some four years in his experiments, and has succeeded in producing some strawberries of unsurpassable fineness.

The varieties raised were Hovey's Seedlings with a few English plants, as fructifiers, and were set in April, in rows three feet apart.

The soil was a moist loam, half an acre in extent, well pulverized by ploughing, and manured at the rate of 20 cords to an acre of seaweed and fish. The first year beets, or other vegetables, might be grown, without detriment to the fruit.

The product from the half acre under cultivation, last season, was 2,000 quarts of fruit, some of which measured 4½ inches in circumference.

Estimated Expense of Culture per Acre.

20 cords of manure, or its equivalent,	$40
Expense of plants (10,000, at $2)	20
Total expense of labour the first season,	100
Total expense incurred the first year	$160
Total expense (labour only) 2nd year,	160
" " 3rd year,	160
" " 4th year,	160
	$640

Value of the Crop.

50 bushels of beets the first year,	$20
4,000 quarts of strawberries the 2nd year,	
4,000 " " the third year,	
4,000 " " the fourth year,	
12,000 quarts of strawberries in all, at 12 cents a quart,	1,440
Total value of the crop for four years	$1,460
Leaving a net gain for four years of	$820
Or for each year, of	$205

The above is simply what has been done in the ordinary culture, without any particular effort or extra exertion, and we have no doubt the crop would be still further increased by improving the variety, and with a better opportunity of selecting the soil, and varying somewhat the kind of manure.

FACTS IN FARMING.—The more dung, the heavier green crops; the more green crops, the more cattle food; the more cattle, the more dung. Hence, by keeping an abundance of cattle, a farm can be improved from year to year.

COMPARISON OF MANURES.—The manure of a horse may neary equal that of a cow, setting quality against quality; and that made by two or three pigs may be equal in value to that of an ox.

Horticultural.

THE APPLE ON PARADISE STOCKS.

Mr. Barry, the talented conductor of the *Genesee Farmer*, remarks, that "the *dwarf apple*, produced by grafting or inoculating on the *Paradise Stock*, is a great desideratum for small gardens, and also for all gardens. It rrquires not much more space than a currant or gooseberry bush. It bears early and abundantly, and the fruit is uniformly larger than standard trees. The fruit is never blown off prematurely by high winds, and is easily gatered. The trees are within reach of the cultivator, without the use of ladders; are easily pruned, manured, and otherwise tended; and, if necessary, may at any time be removed from one place to another, and at any age, without interrupting seriously their productiveness. These miniature apple trees are among the chief beauties of the fruit gardens. The Paradise Stocks used in this country are usually imported from France, and consequently dwarf trees are more costly than standards, grown on free stocks, raised from seed obtained at little or no cost at the cider mills; but by-and-by our nurserymen will, no doubi, propagate their own stocks, and the trees will consequently become cheaper.

"The Paradise is a species of apple that reproduces itself from seed, but is usually propagated for stocks by layers. When the plants are removed from the nursery, one year's growth from the bud, they should invariably be cut back till within three or four buds of the stock; and they should never be planted so deep as to place the bud or graft in the ground, as in that case it will emit roots, and the effect of the Paradise Stock will be lost. The soil should possess considerable firmness for dwarf apples, as the roots remain so near the surface. Annual pruning is necessary to give the trees a good shape, as well as to keep up their vigour; and they should also receive an annual dressing with compost."

QUALITY OF APPLES, AS DECIDED AT THE BUFFALO POMOLOGICAL CONVENTION.

As the business of cultivating fruit is becoming an important interest to the farmers of Canada, a list of varieties of apples, with remarks by the Convention and Mr. Barry, as published in the *Genesee Farmer*, and for the infarmation of those interested in the culture of fruit, we publish it nearly entire in this Number;—

The *St. Lawrence Apple*.—Several gentlemen from Canada, Western New York, and elsewhere, regarded this fruit as being *nearly* first rate, and some even *quite* first rate, in quality. The tree is a vigorous grower and a good bearer, and the fruit always large, fair and fine. Mr. Thomas of Macedon objected to it on account of its *coarseness*, and said that he regarded it as not more than second or third rate. After considerable discussion it was voted, though not unanimously, to be first rate.

Pomme Royal or Dyer.—Mr. Elliot said that this apple was cultivated in Ohio, in some collections, as *Cole's Spice* and *Golden Spice*. Mr. Thomas said it was cultivated in Western New York, in some collections, as *Hollow Crown*.—Unanimously passed as first rate.

Early Joe.—All who knew this fruit concurred in its being one of the very best apples of its season, but that it should be eaten soon after being picked from the tree.—[We have had this fruit in fine condition 6 weeks after being gathered.]

Early Strawberry.—First rate for its season.

Sweet Bough.—First rate for its season.

Sine qua non.—A First rate for its season.

Minister.—A famous New England apple. Passed as second rate.

Summer Rose.—Unanimously passed as first rate. Mr. Elliot of Ohio remarked that if he should cultivate but one early apple it would be this.

Summer Queen.—A sweet variety was presented under this name, but was decided to be

the *Augustine.* The true variety, being that described by Downining, passed as first rate for cooking, and second for the table.

Augustine.—Third rate.

Dutchess of Odenberg.—Frst rate for cooking, and second for the table.

Waggoner Apple.—A new variety from Chas. Lee, Penn Yan, passed by, being unknown to most members of the Convention. J. J. Thomas considered it as comparing favourably with the *Spitzenburg* and superior to the *Melon;* defective only in being a little too compact, but first rate. P. Barry considered it as nearly if not quite first rate.

Fameuse or Pomme de Neigo.—Considered by many as first rate, especcially in the more northern localities.

Red Astracan.—Passed as first rate for cooking and second for the table. This is a beautiful and very popular summer fruit, always commanding a high price in market. Mr. Thomas remarked that it was regarded as good for market on account of its beautiful skin but beyond the skin it had little merit. He says, however, in the Cultivator of last month, that "it ought to have been stated to the convention, that this variety, though not a good table fruit, possesses great excellence as a very early *cooking* apple, being far superior, in this respect, to the Yellow Harvest."

Rock Island Greening.—Passed as a first rate standard fruit, both for table and cooking Mr. Allen, of Mo., said there it was an autumn fruit and grew much larger than here.

Newton Pippin [Yellow]—This apple elicted much discussion—western cultivators generally agreeing that, with them, it was not worthy of cultivation. Laid on the table.

Newton Pippin [Green].—Gentlemen from Western New York, Canada, Ohio, and Illinois, stated that their experience with this apple was unsatisfactory. Mr. Dougall and Mr. Beadle of Canada, stated that they had succeeded in raising a good crop by the application of manure and ashes. All agreed that it required good soil and good culture. Mr. Thomas remarked that even with Mr. Pell, under his high culture, a large portion of the crop was knarly and unmarketaale. Mr. Prince thought that in a good soil, and with manuring and good culture, it would be good every where.

Vandevere. Passed as first.

Yellow Belleflower. Mr. Coit, of Ohio, said this was the most popular apple in the Cincinatti market. Mr. Elliot did not agree with Mr. Coit in this. P. Barry remarked that in Western New York it was a popular and excellent variety. Mr. Prince said there were several apples cultivated under this name, and suggested that it be passed by.

Twenty Ounce Apple. First in size, beauty and productiveness, but second in quality.

Twenty ounce Pippin. Third rate

Gravenstein. First rate in its season.

Fall Pippin. First rate.

Autumn or *Late Strawberry.* First rate.

Red and Green Sweeting. Unworthy of cultivation, although some valued it for baking.

Swaar. First rate in all respects.

Belmont. First rate, though said by Mr. Elliot to be rejected in southern Ohio.

Hawthornean. Voted unworthy of cultivation.

Mother Apple. Frst rate. Has the highest character wherever known.

Baldwin. Mr. Elliot and others said it was subject to the bitter rot, and valueless in Ohio. Voted first rate Massachusetts and New York, but unsuccessful in Ohio.

Jonathan. First rate.

Porter. First rate.

Rambo. Frst rate wherever cultivated.

Bourassa. Passed by.

Hubbardson Nonsuck. First rate.

Pomme gris. Frist rate in the north and in Canada.

Gloria Mundi. Unworthy of cultivation.

Bullock's Pippin (Coxe,) or *Americal Golden Russet,* (Downing). Worthy of general cultivation.

Jersey Sweeting. First rate; worthy of general cultivation.

Cornish Gilliflower. Unworthy of general cultivation.

American Summer Pearmain. First rate in all respects.

King of Pippins. Second rate.

Summer Hogloe. Different from *Hogloe crab* with which some have confounded it.—Considered by many as first rate.

English Russet.—Half a bushel of this variety, of last years growth, was presented by D. N. Robinson of Buffalo, quite fresh and sound. Members of the Convention agreed that this was a valuable variety, being a great keeper, and the tree a fine grower and bearer. Much discussion was elicted regarding the name. Mr. Prince contended that it was not the apple described by Downing as the English Russet—that English russet was too vague a name and meant nothing, as there are many English Russets.

The late Strawberry Apple.—The following, with respect to this apple, is from an Address delivered before the Aurora Horticultural Society, by Mr. David Thomas:—

"Thirty years ago, when Jonathan Swan bought the place in this village, where he long resided, he discovered the *Strawberry* apple, on what appeared to be a grafted tree, but from whence it came has never been ascertained to my knowledge. Until very lately, it was unknown to pomologists; yet, as a table fruit, it

has scarcely a superior. It was probably grafted or planted by Seth Phelps, formerly First Judge of this county,"

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In the 12th and last number of the 7th volume of that excellent Agricultural Journal, *The American Agriculturist*, we find much information that will doubtless be found interesting to Canadian farmers. The following digest we have collected from that source :—

SEASON FOR FELLING TIMBER.

" The true cause of decay in timber may be traced, in many instances, to felling trees at a wrong season, and that *wrong season is spring ;* for then the sap is in a peculiar state, and highly disposed to ferment, when it can no longer flow through the tissues. It may be said to act as yeast acts on moisteded flour.

" In order that wood may possess its greatest degree of natural compactness and elasticity, combined with hardness and durability, it must be felled in the early part of winter."

ELECTRO CULTURE.

This modern humbug, as such it may be safely styled, is thus adverted to by A. B. Allen, Esq., the able Editor of the *American Agriculturist :*—" From the success of a few isolated experiments, made years ago, which developed vegetable life with astonishing rapidity, magnificent calculations were made of the future economical application of electricity in practical Agriculture. Many enthusiasts have recently tried various experiments in it, and have achieved what they deemed the most successful results. But it has been since ascertained, that in the ardour of their zeal in arriving at satisfactory conclusions, their gardeners and other labourers were directed to supply an emple bed of rich vegetable mould, for the electrical wires to revel in, and liquid manures and composts of various kinds were added, from time to time, as being best calculated to produce an abundant and rapid flow of the galvanic current."

IMPROVED VARIETIES OF FRUITS.

At the National Pomological Convention, recently held in New York, after three days' discussion, the following select list of fruits was recommended for cultivation throughout the country, as thriving the best in the different soils and climates of the United States.

Peaches.—Varieties recommended for general cultivation :—Grosse Mignonne, Early York (serrated), Old Mixon (free), Coolidge Favourite, Crawford's Late, Bergen's Yellow. For particular localities, Heath Cling.

Plums recommended for general cultivation :—Jefferson, Washington, Green Gage, Purple Favourite, Coe's Golden Drop' Bleecker's Gage, Frost Gage, Purple Gage. For Particular localities, Prince's Imperial.

Cherries.—Varieties recommended for general cultivation :—Black Eagle, May Duke, Bigarreau, Black Tartarian, Knight's Early Black, Downer's Late Red, Elton, Dounton.

Apples.—Varieties recommended for general cultivation :—Early Harvest, Large Yellow Bough, American Summer Pearmain, Gravenstein, Summer Rose, Early Strawberry, Fall Pippin, Rhode Island Greening, Baldwin, Roxbury Russet. For particular localities, Yellow Belle Fleur, Swaar, Esopus Spitzenburg, Newtown Pippin.

Pears.—Varieties recommended for general cultivation :—Madeline, Dearborn, Seedling, Bldgood, Tyson, Bartlett, Seckle, Louise Bonne de Jersey, Flemish Beauty, Beurre, Bosc, Winter Nelis, Beurre D'Aremberg, Golden Beurre of Bilboa. For certain localities, White Doyenne, Gray Doyenne.

Treatment of Rose Bushes.

Rose bushes require a very rich earth, and the gardeners of Europe direct them to be removed, or the soil about their roots changed once in every three or four years. Experience in this country proves that we may have everblooming roses in perfection, without this trouble, as it is only necessary to renew the exhausted fertility of the soil, which can readily be done by using the following liquid manure :—

Into a common-sized barrel, put about half a bushel of cow manure (not fresh), and fill it to the top with water; stir well, and let it stand twenty-four hours ; then take equal parts of this liquid and clear water, and pour it around, and over, but not on the roots of the rose bushes. When the barrel is empty, fill it again with water, which may be used again without diluting. Do this regularly once in three or four weeks, taking care, when possible, to apply it just before, or during a rain, in order that it may sink still more diluted, directly to the roots, or it will form a crust on the surface and injure them.

Soap suds is also a mild and excellent fertilizer to apply to delicate plants, but is apt to be

unsightly by the white crust it makes on the surface, unless the earth is stirred with a trowel, to let it sink into the soil.

Both of the above are valuable in the vegetable garden; also, for cabbage and egg plants, artichokes, &c.

Preserving Buds and Grafts.

The mode suggested by T. G. Yeomands, of Walworth, New York, of preserving the scions of fruit trees in moist saw-dust, has proved superior to any other. It is better than damp moss in the facility with which the scion may be perfectly embedded in it, leaving no interstices, and it excels moist sand in being lighter, more spongy, and entirely free from a grit which may injure a knife. We have without any difficulty preserved scions, which were cut in the summer, for budding, till the following spring, and inserted them as grafts with entire success; and we have kept water-cut grafts till midsummer perfectly fresh, and employed them successfully in budding. A bushel of saw-dust will retain its moisture for many weeks nearly unaltered; but water must not be applied too copiously, or water soaking and decay will be the result. The north side of a building, or a cellar, is the best place.—[N. Y. Farmer and Mechanic.

Disbudding is the art of preventing the development of useless buds at the expense of those which should be preserved; as it must be more advantageous to check an unnecessary shoot at its start, than to wait until it has exhausted the tree of a quarter or less quantity of sap, and then cut it off. Roses judiciously disbudded not only bloom better, but form finer and more vigorous plants. This practice is especially applicable to peach, apple and pear trees. Do not permit a tree to form [illegible] organize much wood nor too much [illegible] would have both sound vigorous and [illegible].

The true Red Antwerp Raspberry is regarded as the most profitable of all fruits to cultivate for market. Mr. Nathaniel Haileck of Milton N. Y., raised 3300 baskets on three fourths of an acre this year, which he sold at 10 cents per basket—$330; soil strong deep loam. Plants have bee set out one, two, and three years. Fruit delicious.

In propagating pinks, carnations, picotees and many other flowering plants and shrubs by cuttings, cut the stem no more than half off, at a hard, well developed joint, which should be bent down and covered with good earth. This enables what will soon be a complete cutting and separate plant, to draw nourishment from the parent roots in part, till new ones are formed. After this, sever the connection, and pot the new plant, or transplant the new tree you have called into existence.

Fruit trees, shrubberies, dahlias, &c. often suffer from drouth, and frequent watering is troublesome and expensive. Place a thick coat of pine straw or other leaves around the tree or bush, so soon as the roots extend. Now water thoroughly once, and the covering will greatly retard evaporation, and keep the earth moist for weeks under the straw in dry weather.

Mechanical.

Manufactures—Cast Steel.

The nature of Cast Steel being, in reality, but little known, its manufacture being confined to but few localities, and its exact properties comparatively not fully understood by many, may render some remarks relative to the properties and habitudes of this most valuable form of iron acceptable to our readers. And we cannot better illustrate the subject than to give the facts, as stated by a Correspondent in one of our foreign exchanges. One fact is understood, that when bars of iron, which have, by process of cementation, become converted into what is called blistered steel, they are, when highly carbonated, extremely brittle, and their internal structure has been altered from a fine granular or fibrous texture, to a large crystalling grain, more or less brilliant and homogenous, in proportion to the purity and soundness of the original bar-iron. The homogeniy is, however, never perfect; and in all cases there are portions, or particles, of each converted bar which have not imbibed any, or a sufficient proportion of carbon to constitute steel; so that the bar is, at best, a mixture of true steel and malleable iron. To produce steel, these cemented bars are broken down, and placed in crucibles of the best clay, in which they are exposed to the intense heat of an air-furnace, until fusion has taken place. When the fusion is supposed to be complete, the steel is poured into cast-iron moulds, heated, but not red hot. As long as any pieces of the steel remain unmelted, a hissing, frying sound may be heard, on moving the cover of the crucible; and the surface of the portion of the metal is observed to be agitated by the incessant escape of gas of great expansive power. When the steel is all fused, the hissing ceases; and the surface of the metal appears like a bright convex mirror, and free from agitation. It does not, however, follow that the metal is fit for pouring; for, though the steely portion of the charge is now perfectly fluid and in a state of extreme division, yet the portion of the charge consisting of the uncarbonated iron (or, in other words, the malleable iron) requiring for its fusion a heat far exceeding the temperature required for reducing the

steel, remains still suspended near the surface of the metal, in a pasty or semi-fluid condition, until it has either imbibed a sufficiency of carbon from the circumnatant steel, or till the temperature shall have been raised sufficiently to effect its fusion. When this has taken place, and the metal is poured, the ingot will be as perfectly sound as any ordinary casting, but slightly porous at the centre, from the shrinkage of the fluid, which, of course, sets first at the outside of the ingot, in contact with the comparatively cold iron of the mould. If any particles of infused, or imperfectly fused iron remain in the steel, when poured, the ingot will be found full of little cells or cavities, numerous and large, in proportion to the quantity of infused iron present; and as iron of the best quality is the most infusible, it follows that the steel prepared from it is more liable to the *bloom—i. e.*, full of cells or cavities—than cast-steel from an inferior kind of iron. In all cases with a sufficient heat, a perfect degree of sharpness and solidity may be given to castings from fused steel; but the intense temperature required to effect this, with fine cast steel, renders it a matter of experiment more than of practical utility. For the common uses for which cast steel is manufactured, the fusion is sufficient to adapt the ingot for tilting into bars, but insufficient to produce a fine and perfect casting. In the common refinery, or running out fire, an analogous phenomena is observable. A portion of the charge is malleabilised during the operation to a certain extent; and, floating to the surface of the denser and more carbonised metal, it forms the cellular face, so strongly developed in very high blown fine metal. In the blast furnace, where portions of the materials arrive at the zone of the fusion in a state of malleable iron, this iron mingles with the more carbonated pig-iron; and when present in excess, it floats to the surface of each pig of iron, occasioning honeycombs, of a depth proportioned to the amount of malleable alloy contained in the pig-iron. When cast-steel is prepared direct from the ore, the cellular structure is never developed, because the fusion is always homogenous, and there can be no particles of malleable iron present to disturb the consolidation of the fluid steel. When a piece of blistered steel is *first fused*, or liquified, in a small clay crucible, and then allowed to cool down, the surface of the cold metal will be found finely radiated, like a fan, with delicate ridges of steel; whilst the lower side of the ingot will be found full of deep hollows, scalloped out like skulls, and covered with a net-work of arborescent crystalization. When a much higher temperature is applied, and the fusion has become perfect and the division of the metallic particles more complete, the ingot will be found, when cooled down in the crucible, smooth upon its surface and sides, und exhibiting merely the linear edges of its crystalline structure.

From this it is clear, that without a full fusion the steel will not fill up even a heated mould with solidity; and, when perfectly fused and rendered liquid, it will, as far as I have seen, fill a mould with perfect solidity, even if the muold be only lukewarm. Of course, where fusion has barely taken place, and there is now great excess of spare temperature above the point of that fusion, the metal sets so speedily as to render it possible to execute any fine castings with it; and I may observe, that unless cast iron be heated very much beyond its melting point, it will not, more than cast steel, exhibit any degree of sharpness in the mould.

If cast-steel be poured into a shallow mould of cast-iron, and the jet of metal be made to fall continuously in one place, it will be found that the steel has penetrated the iron at that place, and a junction is formed, exhibiting the steel passing through every intermediate state into the cast-iron mould. When the mould is deep, the bottom is protected from the jet of steel by depth of the fluid mass; so that the moulds are uninjured; but, on the supposition that the moulds should be made previously red hot, I am of opinion that the steel would penetrate and unite with the iron of the moulds. This, however, would not prevent the adoption of red-hot moulds of a more infusible substance than cast-iron; but I do not think that the heating of the mould would at all influence the stability of the ingot.

Pig iron is an alloy of malleable iron, white cast-iron, steel, and grey cast-iron; for it is produced on the large scale by a simultaneous fusion of a multitude of pieces of iron-stone, whose metallic contents are existing in all those various states when they arrive at the zone of fusion above the blast; and of all the pig-irons of commerce, that which contains the greatest proportion of grey cast-iron will be the best suited for fine castings; but it will be also the weakest; whilst deeply honey-combed iron, containing a large alloy of malleable and steely iron, will prove suitable only for large castings, and where great strength is required.

The Scotch iron is a strong instance of the correctness of these views; for the iron-stone is rich, homogenous, and easily carbonated; the furnaces are capacious and lofty; and the hot-blast stoves are very effective and powerful; hence, the materials are nearly all carbonated before fusion, and a weak, but fluid cast-iron is produced, free, or almost free, from malleable alloy.—[New York Farmer and Mechanic.

MILK CLEAN.—The first drawn milk contains only 5, the second 8, and the fifth 17 per cent. of milk.

A large Scythe Factory.

The Scythe Manufacturing establishment of Reuben B. Dunn, Esq., of North Wane, in Maine, is the largest of the kind in the world. The establishment consists, besides warehouses, furnishing shops, &c., of three principal buildings for manufacturing, two of which are one hundred and forty-four feet each in length. In these, and in departments connected with the establishment, are employed about one hundred men, many of whom have families settled at the place. A flourishing village has grown up within a few years, and is rapidly increasing. Twelve thousand dozen scythes are annually manufactured, to produce which are required 450,000 lbs. of iron, 756,000 lbs. of steel; 1,200 tons of hard coal, 10,000 bushels of charcoal, 100 tons of grindstones, and half a ton of borax. This last article is used in the process of welding.

Mr. Dunn is erecting additional works in the vicinity, which will be soon completed, when he will be enabled to turn out 17,000 dozen scythes annually. This establishment is now more than double the extent of any other similar one in the world; none even in England being found to compete with it.—[New York Farmer and Mechanic.

New Steam or Hydraulic Wheels.

At the meeting of the Royal Cornwall Polytechnic Society an invention, by Mr. James Sims, of Redruth, was explained, the object of which was to carry out simplicity and portability to a greater extent than had hitherto been effected in such engines. It was intended to be worked either by steam or water power. As a steam-wheel or rotary engine, he conceived it surpassed all former attempts at this principle, as the motive power is in the piston and cylinder of the ordinary construction of Boulton and Watt's engines, and the expansive principle of cutting off the steam is carried to a greater extent than in those engines, the motion of the piston being independent of the motion of the wheel, and almost instantaneous. In all the rotary or steam-wheels hitherto before the public, he was not aware that any of the inventors had availed themselves of the benefit of working with the ordinary cylinder and piston; they have, therefore, failed to carry out the expansive principle, and also to prevent the leakage of steam. In some, packing has been attempted, but here the friction is so great, and the wear so rapid, that not one on this plan has succeeded well. In this engine, on the revolution of the wheel, when the cylinder comes to a perpendicular position, the steam is admitted underneath the piston, at the same time that it escapes from the top side, thereby shifting the weight to the top of the wheel, and causing it to revolve by its preponderance, the power of the engine being the amount, of weight moved a certain number of feet in a given time. Regularity of motion being essential, it might be accomplished by a good governor. The blow against the buffers is in proportion to the extra quantity of steam admitted, and is on the same principle as the ordinary reciprocating or pump engine. As an hydraulic engine, it is well adapted to situations where a good height of water can be admitted, but not sufficient for the ordinary water-wheels. The water might be conveyed in pipes, when a very small stream could be made available to an extent in proportion to its height and quantity. It would be admitted into the cylinder the same as steam, thereby shifting the weights, and making a very effective and economical water-wheel, as every pound of water would be used. The velocity of the wheel would be much superior to the ordinary water-wheel, being in proportion to the height and consequent pressure, and the quantity of water to be obtained. So, also, its velocity as a steam-wheel would depend on the pressure of steam, admitting the shifting of weights, however quick the passing of the aperture for the admission of the steam. The engine was at present in its infancy, and although it worked well there was, no doubt, room for further improvement. The principle being good, as regards the application of steam and water power, and its economy and portability being conspicuous, it should not be lost sight of; he should, therefore, proceed with his experiments, and hoped at the next meeting to report more fully of its advantages. Its application may be general, and he thought more advantageously than almost any other engine, as, in the absence of the crank, each end of the shaft is at liberty for any attachment. The small amount of friction consequent on its simplicity is seen at once, as is also the small amount of liability to derangement.

Screw Propulsion.

We learn from the London Mining Journal that at the late meeting of the Liverpool Polytechnic Society, Mr. Grantham read an interesting paper, on the subject of the screw propeller; and being a subject to which he has devoted much of his time, and has had considerable experience, he was listened to with marked attention. Mr. G. illustrated his remarks by exhibiting several beautiful models and drawings, and stated that his object was rather to make a few additional remarks to what he had some years before stated, than to go through the whole subject from its origin; he also wished rather to confine his observations to the screw as an auxiliary power to be employed in connection with sails, than as an independent power. He observed that the question of screw

propulsion had been under a cloud for some time since, owing to the many discouragements under which the subject laboured. The difficulties, however, were not connected with the principle, but were owing entirely to fault in practice. The depressed state of the times was also much against the new projects. Much forbearance on the part of the public was required—the principle was right—time and experience would perfect it. Mr. Grantham then drew attention to the screw, and to several vessels which had continued to work well for some time, but more particularly to the Sarah Sands, which, beyond all doubt, he considered to be the most important case that could be found to test the question of auxiliary steam-power as necessary to the merchant's service. She was now again about to start for America, having crossed the Atlantic about 16 times—and if crowds of passengers and large cargoes were any test of public confidence, she most certainly possessed a good share of it. She had preserved great regularity, but owing to her small power, and being usually very deeply laden, her speed was not great, unless favoured by the wind, which had not often been the case. Her qualities were the best displayed in bad weather. Mr. Gratham made some observations respecting the Government screw-steamers—immense sums of money had been expended on experiments and on head vessels, but he regretted to say they had produced nothing that was likely to lead to improvements in screw propulsion. Mr. Grantham invited discussion; some remarks were made by the chairman and others, but all favourable to his general opinion. Mr. Smith, (of the Gas Company) paid him a high compliment on his experience in screw propulsion, and proposed a vote of thanks to Mr. Grantham, which was carried by acclamation.—[N. Y. Far. & Mec.

Dick's Anti-Friction Press.

It is very well know to the scientific public that Brama's Hydrostatic Press has been, up to this time, the most powerful of all presses, and this mainly because of the comparatively small amount of friction incident to its operation; and it has been without competition, for all purposes requiring great intensity, ever since its invention. The expensiveness of this press, however, has, in a great measure, prevented the use of it by persons of moderate means, and its great weight has excluded it from being used as a portable machine.

Much ingenuity has been employed for many years, but with no valuable results, for the purpose of so reducing the item of friction in presses, that they might be applied to purposes requiring great intensity, and it has been reserved for this day of wonderful development in the labour-saving machinery to accomplish this great desideratum.

Dick's Anti-friction Press, now exhibiting at the Fair, is an invention of extraordinary simplicity, without complexity, and operating without friction. It has not a single rubbing or sliding surface in any of its parts, except the mere guides, and comprises, perhaps, double the power, for the initial force exerted to operate it, which is to be obtained from the Hydrostatic Press, regard being had at the same time to the quantity of motion that has to be gone through in operating each.

This machine is so simple, and so easy of construction, that the price at which it can be supplied will not exceed one-third that of the Hydrostatic, for the purposes for which this last is used. For all minr purposes a cheap, convenient, and light article can be supplied, at a less cost than any other form of press; and this latter is peculiarly adapted to pressing cotton, hay, tobacco, paper, books, embossing, stamping, coining, shearing, punching and cutting iron, cider pressing, packing flour, baling goods, &c.

We understand that the inventor builds hay presses of a portable kind, which can be hauled to any part of the country, on a two-horse waggon, and in this way the labour of loading hay on and off waggons, to be hauled to a press, is entirely saved.

The punches for punching boiler-plates, &c., which the inventor builds, do not weigh more than one-eighth of what the ordinary punches do; they are afforded for one-quarter of the price, and do not require more than one-half the force in performing the operation; and as there is no friction, there is necessarily no oil or grease required for lubrication.

The inventor of this valuable discovery is a Mr. Dick, of Meadville, Pennsylvania; and we think that he has made a decided advance towards perfection in this department of mechanics.

We understand that Mr. I. E. Holmes, who has been particularly engaged in the application of the above press to the various purposes of pressing hay, cotton, cheese, printing, embossing, &c., is about applying this enormous power connected with a rotatory motion to the purposes of crushing the rocks in which ores are contained; and he feels confident that the gold diggers can be supplied with a machine of the utmost importance to them.

Importance of Study in Youth.—If it should ever fall to the lot of youth to peruse these pages, let such a reader remember, that it is with the deepest regret that I recollect in my manhood the opportunities of learning which I neglected in my youth; that through every part of my literary career, I have felt pinched and hemmed in by my own ignorance; and I would at this moment give half the reputation I have had the good fortune to acquire, if by so doing

I could rest the remaining part upon a sound foundation of learning and science.—[Sir Walter Scott.

Miscellaneous.

COMMON SCHOOL ARCHITECTURE.

As we now have a Common School System in the country, that is calculated, by a little improvement, to exalt the standing of the yeomanry to a much higher rank, in an intellectual point of view, than what they have heretofore occupied, we shall at all times, when a favourable opportunity presents itself, give valuable information on such subjects as would be interesting and useful to all who are anxious to promote the educational interests of the rural population of the Province. The following description of school architecture was accompanied, in the *Agriculturist*, with drawings of the front elevation, ground plan, desk, section of seat and desk, side elevation, and an additional ground plan, shewing the hollow in the wall, &c., all of which were neatly executed, and would cost, at the lowest calculation, £5, if engraved here, on wood. This expense cannot be incurred by us at present, but the written description being plain, will be readily comprehended by the reader, although not accompanied by drawings :—

Under this head it will be sufficient to enumerate the principal features of school houses as they are.

They are almost universally badly located, exposed to the noise, dust, and danger of the highway, unattractive, if not positively repulsive, in their external and internal appearance, and built at the least possible expense of material and labour.

They are too small. There is no separate entry for boys and girls appropriately fitted up; no sufficient space for the convenient seating and necessary movements of the scholars; no platform, desk, nor recitation room for the teacher.

They are badly lighted. The windows are inserted on three or four sides of the room, without blinds or curtains to prevent the inconvenience and danger from cross lights, and the excess of light falling directly on the eyes or reflected from the book, and the distracting influence of passing objects and events out of doors.

They are not properly ventilated. The purity of the atmosphere is not preserved by providing for the escape of such portions of the air as have become offensive and poisonous by the process of breathing, and by the matter which is constantly escaping from the lungs in vapor, and from the surface of the body in insensible perspiration.

They are imperfectly warmed. The rush of cold air through cracks and defects in the doors, windows, floor, and plastering is not guarded against. The air which is heated is already impure from having been breathed, and more so by noxious gases arising from the burning of floating particles of vegetable and animal matter coming in contact with the hot iron. The heat is not equally diffused, so that one portion of the school room is frequently overheated, while another portion, especially the floor, is too cold.

They are not furnished with seats and desks, properly made and adjusted to each other, and arranged in such a manner as to promote the comfort and convenience of the scholars, and the easy supervision on the part of the teacher. The seats are too high and too long, with no suitable support for the back, and especially for the younger children. The desks are too high for the seats, and are either attached to the wall on three sides of the room, so that the faces of the scholars are turned from the teacher, and a portion of them at least are tempted constantly to look out at the windows—or the seats are attached to the wall on the the opposite sides, and the scholars sit facing each other. The aisles are not so arranged that each scholar can go to and from his seat, change his position, have access to his books, attend to his own business, be seen and approached by the teacher, without incommoding any other.

They are not provided with blackboards, maps, clock, thermometer, and other apparatus and fixtures, which are indispensable to a well-regulated and well-instructed school.

They are deficient in all of those in and out door arrangements which help to promote habits of order and neatness, and cultivate delicacy of manners and refinement of feeling. There are no verdure, trees, shrubbery, nor flowers for the eye; no scrapers and mats for the feet; no hooks and shelves for cloaks and hats; no well, no sink, basin or towels to secure cleanliness, and no places of retirement for children of either sex, when performing the most private offices of nature.

In the following description the correct principles of school architecture are observed :—

The building stands 60 feet from the highway, near the centre of an elevated lot which slopes a little to the south and east. Much of the larger portion of the lot is in front, affording a pleasant play ground, while in the rear there is a woodshed, and other appropriate buildings, with separate yards for boys and girls. The walls are of brick, and are hollow, so as

to save expense in securing antaes or pilasters; and to prevent dampness. This building is 33 feet 6 inches long, 21 feet 8 inches wide, and 18 feet 9 inches high from the ground to the eaves, including 2 feet base, or underpinning.

The entries, one for boys and the other for girls, are in the rear of the building, through the woodshed, which, with the yard, is also divided by a partition. Each entry is 7 feet 3 inches, by 9 feet 3 inches, and is supplied with a scraper and mat for the feet, and shelves and hooks for outer garments.

The school room is 24 feet 5 inches long, by 19 feet 4 inches wide, and 15 feet 6 inches high in the clear, allowing an area 472 feet, including the recess for the teacher's platform, and an allowance of 200 cubic feet of air to a school of thirty-six.

The teacher's platform is 5 ft. 2 inches wide, by 6 feet deep, including 3 feet of recess, 9 inches high. On it stands a table, the legs of which are set into the floor, so as to be firm, and at the same time moveable, in case the platform is needed for declamation, or other exercises of the scholars. Back of the teacher is a range of shelves already supplied with a library of near 400 volumes, and a globe, outline maps, and other apparatus. On the top of the case is a clock. A black board 5 feet by 4, is suspended on weights, and steadied by a groove on each end, so as to admit of being raised and lowered by the teacher, directly in front of the book-case, and in full view of the whole school. At the bottom of the black board is a trough to receive the chalk and the sponge, or soft cloth.

The passages are 2 feet wide that extend round the room. The passages between the desks are 15 inches wide, and allow of easy access to the seats and desks on either hand. The middle passage is 5 feet 3 inches wide, and in the centre stands an open stove. The temperature is regulated by a thermometer.

Each pupil is provided with a desk and seat, the front of the former, consituting the back or support of the latter, which slopes 2½ inches in 16. The seats also incline a little from the edge. The seats vary in height, from 9½ inches to 17, the youngest children occupying those nearest the platform. The desks are 2 feet long by 18 inches wide, with a shelf beneath for books, and a groove on the back side to receive a slate, with which each desk is furnished by the district. The upper surface of the desk, except 3 inches of the most distant portion, slopes one inch in a foot, and the edge is in the same perpendicular line with the front of the seat. The level portion of the desk has a groove running along the line of the slope so as to prevent pencils and pens from rolling off, and an opening to receive an inkstand, which is covered by a metallic lid.

The windows, three on the north and three on the south side, contain each 40 panes of 8 by 10 glass, are hung (both upper and lower sash) with weights so as to admit of being raised or lowered conveniently. The sills are three feet from the floor. Those on the south side are provided with curtains and blinds.

The proper ventilation of the room is provided for by the lowering of the upper sash, and by an opening 14 inches by 18, near the ceiling, into a flue which leads into the open air. This opening can be enlarged, diminished, or entirely closed by a shutter controlled by a cord.

The sides of the room are ceiled all round with wood as high as the window sill, which, as well as the rest of the wood work of the interior, is painted to resemble oak.—[Barnard's School Architecture.

Farmers should Write for Agricultural Journals

The following Communication, from the pen of Mr. G. P. Lewis, who, by the way, we take for granted, is a practical farmer, contains such a vast fund of common sense, and good advice to farmers, that we copy it entire, in the hope that the Canadian farmers will take the hint, and write more frequently for their own Agricultural papers t—

As the season has arrived for the renewal of subscriptions to your journal, I would give, through your columns, some reasons why agricultural papers are not better patronized, with some of the leading objections against them.

The first, and probably one of the strongest objections, is, that a large proportion of farmers are averse to innovations, new plans, and systems, or in other words, "new-fangled notions." The manufacturer and mechanic are ever on the alert, and ready to avail themselves of any improvements, inventions, or discoveries, that are made by ingenious men and learned professors. Talk to these farmers of the benefits that they may derive from the aid of science, they will look at you with an incredulous smile and ask—What do scientific men know about ploughing, sowing, raising stock, &c. ? Point out to them the advantage of a different mode of applying their manures, or a different system of rotation of crops, they probably will admit that it looks reasonable and right; but the "old system," the "system of their fathers" is good enough and has always supported them. Thus we have hundreds of honest, hard-working farmers, who *do* and *are* willing to trudge on in the old way. These men cannot be induced to take an agricultural paper. They say that they have not time to read ; for, daring the day, they are busy at work, and evenings, they are tired and sleepy ; and if they read it, they say that they cannot understand the "high-flown talk" about carbon, oxygen, &c.

The second class of farmers who object to

taking agricultural papers, are men who learned the art of farming in their youth—"it is their trade and they understand it thoroughly"—and they "wonder that editors of newspapers attempt to teach farmers farming." Happy souls! How enviable their condition.

We have a third class, who object, on the ground that the contributors are mainly scientific and theoretical men, or retired merchants who are known as "gentleman farmers," without practical knowledge or experience, who support their farms, instead of their farms supporting them. Their knowledge of farming, they say, is gained by reading, and occasionally riding or walking over their farms, and publish accounts of overgrown cattle, fine sheep, and immense crops, raised at the cost of double their value, with whom the real farmers are neither willing nor able to compete. "Such farming will not answer for them, nor benefit them in any way." They have to get a living from their farms, and have no other resources to rely upon.

The first class of objectors are to be overcome by the example of their more intelligent and enterprising neighbors. The second class of these modern Solomons and oracles of wisdom, who can learn nothing more, must be "left alone in their glory," until time and the march of improvement leaves them so far in the rear that they are willing to confess their ignorance and call for help. As to the third class, the remedy is within their reach. They have the privilege equally with the amateur farmers, of contributing to the agricultural journals. Then, practical farmers, at once avail yourselves of this privilege. Give us the result of your experience and tell us the evils that you complain of; if you have made any discoveries or improvements in your mode of applying manures in raising crops, in farming and managing stock, write out a statement and send it to Mr. Allen, or some other editor, and I doubt not, it will be thankfully received and published. Would that be book farming? All theory and no practice? To all such, I say, write yourselves, and make the papers what they should be—practical journals of agriculture. No system that is not based on practical results, will ever be regarded as valuable by intelligent men. The observations and experience of many intelligent, practical farmers, who have hitherto remained silent, would be a valuable addition to our agricultural literature, and of incalculable benefit to their co-laborers. To such farmers, I say, do not withhold your contributions because you are not skilled in grammar. It is not fine writing that we want, but facts and ideas conveyed in an intelligible manner. Farmers should learn, that, by an interchange of experience and opinion through the medium of agricultural journals, they can confer mutual benefit upon each other. They should also remember that these journals are published for the dissemination of a knowledge of the best modes of making, preserving, and applying manures to different crops; the best and cheapest methods of preparing the soil; the best and most economical manner and time of seeding and harvesting particular crops; the best kinds of crops for a particular soil or climate; and the best breeds, and the best manner of feeding or managing any particular kind of stock, &c., &c.

No man can fail to perceive that these results can be best attained by educated, intelligent, and practical farmers, aided by the almost daily discoveries, by means of science.

Female Culture.

The great entertainments of all ages are reading, conversation and thought. If our existence after middle life is not enriched by these, it becomes meagre and dull, indeed. And these will prove sources of pleasure just in proportion to previous intellectual culture. How is that mind to have subject matter of pleasurable thought during its solitary hours, which has no knowledge of the treasures of literature and science, which has made no extensive acquaintance with the distant and the past? And what is conversation between those who know nothing? But on the other hand, what delight is that mind able to receive and impart, which is able to discuss any topic that comes up, with accuracy, copiousness, eloquence and beauty! The woman who possesses this power can never fail to render herself agreeable and useful in any circle into which she may be thrown, and when she is so she cannot fail to be happy. A full mind, a large heart, and an eloquent tongue, are among the most precious of human things. The young forsake their sports and gather around, the old draw nigh to hear, and all involuntarily bow down to the supremacy of mind. These endowments add brilliancy to youth and beauty, and when all other charms are departed, they make old age sacred, venerable, and beloved.

The Future Destiny of Man.

What a proof is steam of the high destiny that awaits our species! The most fervid imagination cannot realize the importance of those discoveries in science and the arts, of which it is the forerunner; the first in that new catalogue of motive agents that are ordained to change the condition of men, and to regenerate the earth; for all that is yet done is but as the twilight that ushers in the orb of day.—Hitherto man has been comparatively asleep, or in a state resembling it—insensible of the rich inheritance which the Creator has placed

at his disposal in the elastic fluids, and of their adaptation to impart motion to every species of mechanism. How few persons are aware that the grand invention of imparting motion to a piston, by steam and other elastic fluids, is the pivot on which the chief affairs of the world are destined hereafter to turn? And the time is not distant when, by means of it, the latent energy of the gasses, or other properties of inert matter, will supersede, in a great degree, the drudgery of man—will perform nearly all the labour which the bones of our species have hitherto been doomed to accomplish. There are persons, however, with minds debased by the eternal bondage in which the mass of our race has always been held, who will startle at the idea of the whole becoming an intelligent and highly intellectual body. They cannot conceive how the affairs of life are to be continued—the execution of innumerable works which the construction of society requires should be performed, if these helots should become free. But can they, can any one, seriously believe that the all-wise and benevolent Creator could possibly have intended that the highest class of beings whom He has placed on this planet—the only one capable of appreciating His works, and realizing correct ideas of His attributes—that the great portion of these should pass through life incessantly toiling for mere food, and undergoing privations and sufferings to obtain it, from which the lowest animals are exempt? Assuredly not. Had such being His design, He would not have created them with faculties expressly adapted for other pursuits.

It is the glory of modern science that it calls into legitimate use both the physical and mental powers of man. It rewards him with numerous forces derived from inanimate nature, and instructs him in the application of them to all, or nearly all, the purposes of life; and eventually it will require from him no greater amount of physical toil than what conduces to the full development of all the energies of his compound nature. It is destined to awaken that mass of intellect which has hitherto lain dormant, and been all but buried in the labouring classes; and to bring it into active exercise for the benefit of the whole. And, for ought we know, the "*new earth*," spoken of in the Scriptures, may refer to that state of society, when science has thus relieved man from all injurious labour—when he will walk erect upon the earth, and subdue it, rather by his intellect than by the sweat of his brow—when the curse of ignorance will be removed, and with it the tremendous punishment that has ever attended it.—[New York Farmer and Mechanic.

TOMATO CATSUP.—Take a bushel of ripe tomatoes, gathered when dry, and boil them three or four hours over a slow fire. Then add half a teacupful of salt, and of ground cloves and pepper each six ounces, and three quarts of vinegar. Then strain the whole through a fine sieve. Then boil one hour—cool and bottle. It must be boiled in a tinned vessel. No other will do. Remember that.

Apple Jelly.

Take good winter apples, not too mealy, pare and cut them in slices, put them into a deep stew-pan, with as much water as will cover them; boil them gently till they will mash, and then strain them through a jelly-bag; to every pint of liquor add one pint of loaf sugar: boil it till it comes to the top, for ten minutes, then pour it into a mould with or without sliced lemon peel. A quart only should be done at a time. This jelly will keep, and make a delicious dish at any time.

Agricultural Products of the United States and France.

A writer in the English Agricultural Gazette makes an interesting comparison of the products of the United States, compared with those of France. The population of the United States is set down at twenty millions, and that of France at thirty-five millions. The proportion of the agricultural population in America is given as 80·4 per cent.; commercial 2.5; and manufacturing 17.1. The writer observes that the agricultural productions of the United States, compared with its inhabitants, is enormous, namely:—

	United States.	France.
Horned Cattle,	14,971,583	9,936,538
Sheep,	19,311,374	32,151,430
Horses and Mules,	4,335,669	3,192,337
Pigs,	36,301,293	4,940,721

He also contrasts the grain crops of the two countries, showing the comparative amounts produced of each kind, in hectolitres, as follows:—

	United States.	France.
Wheat,	30,000,000	69,000,000
Barley,	1,500,000	16,000,000
Rye,	6,000,000	27,000,000
Oats,	44,000,000	48,000,000
Indian Corn,	135,000,000	7,000,000
Buckwheat,	2,500,000	8,000,000

"The United States," says the writer, "produce annually 70,000 tons of wool, 600 tons of hops, 300 tons of beeswax, 10,000,000 tons of hay, 95,000 tons of hemp and flax, 100,000 tons of tobacco, 40,000 tons of rice, 395,000 tons of cotton, 60,000 pounds of cocoons of silk worms, 77,000 tons of sugar, and 5,000 hectolitres of wine. The produce of the farm-yard or cow-house is esimated at £7,000,000 ($35,000,000); that of orchards £1,660,000; forests £2,720,000." The total amount of agricultural produce amounts to the enormous sum

PATENT LARD LAMPS.

We have now in use one of the above-named articles, which we would strongly recommend to our readers, combining, as it does, simplicity, durability, and cheapness, both as to its cost and consumption of lard. The usual defects of lard lamps, the congealing of the lard, is, by a simple contrivance, completely removed. They are manufactured and sold in this City, by Mr. Alexander Forbes, 87, Victoria Street.

NOTICES OF BOOKS, &c.

SCIENTIFIC AGRICULTURE by M.M Rodgers, MD. Rochester. Erastus Darrow, Publisher.

The above Publication treats on a subject of great importance to the practical Agriculturist, and should, in the words of the Author, "secure, at least, an impartial examination;" which, when we inform our readers that it treats on the Elements of Chemistry, Geology, Botany, and Meteorology, as applied to Practical Agriculture, it will doubtless receive. It is written in a plain, practical style, and illustrated with numerous engravings.

IDLENESS.—The farmer should look upon every *idle man* with eyes of suspicion, whether he be *on* or *off* his farm; for, he may rely on it, his support *comes at last out of the ground.*

ECONOMY IN BUILDING MATERIALS.

Let us examine whether it would be economy for the farmers to use stone, brick, and iron almost exclusively in building. In most parts of the United States, buildings can be made of wood far cheaper than of any other material. I suppose that a barn built of wood, for instance, which would cost $300, might cost $1,000 if made, of stone, brick, and iron. The interest on the excess of cost, $700, at 7 per cent., is $49 per annum, a sum sufficient to build a new frame barn every six years.—Would it be economy to expend the $700 in building a barn of imperishable materials, notwithstanding it might "last a century," or even untold centuries? I fully believe that iron might might be economically used in some cases, for building in cities, but I doubt the economy of substituting it for wood, in farm buildings, in a country where wood is so cheap as it is in the United States. It is nevertheless true, that "farmers and others of this country, too frequently build for temporary use." It is still more true, that those do not study economy who, as is very often the case, "build themselves out of house and home." I fear that this would still more often be the case, if farmers generally undertook to folfow the advice of Mr. Cooke, and "discontinue the use of all kinds of lumber hitherto employed in the construction of houses." Much more might be said upon this subject.

THE HEDGEHOG—It has been ascertained that the most violent poisons have no effect on the hedgehog; and consequently the animal must be very useful in forests, etc. for destroying noxious reptiles.

MARKET PRICES.

		TORONTO, January 27.		MONTREAL, January 18.		NEW-YORK, January 20.			LIVERPOOL, January 12.			
		s.	d.	s.	d.	s.	d.	s.	d.	St'g.	s.	d.	s. d.
Flour	196lbs	17	6	21	3	24	0	24	3	26 3	27	6	barrel. 26 6	27 0
Wheat	60lbs.	3	9	4	5					5 1	6	3	70lbs. 7 0	7 3
Oats	34lbs.	1	1	1	3					1 9	2	0	65lbs. 2 9	3 6
Rye	56lbs	3	0	3	4									
Barley	48lbs.	1	8	1	10					3 9	4	4	per qr. 36 0	38 0
Corn	156lbs												per qr. 28 0	30 0
Peas	60lbs.	1	6	1	10								per qr. 44 0	46 0
Pork, mess	barrel.					75	0			70 0	75	0		
" prime	"					41	3			65 0	67	6		
" fresh	160lbs	15	0	20	0	25	0	28	9					
Beef, mess	barrel.									57 6	62	6		
" fresh	100lbs	12	6	20	0	20	0	27	6					
Hams	1lb.	0	5	0	6					0 3½	0	5½		
Bacon	1lb.	0	4	0	5					0 4½	0	5½		
Cheese	1lb.					0	6	0	7½	0 4	0	4½		
Butter	1lb.	0	8	0	10	0	10	1	0	0 9	0	11	112lbs. 57 0	61 0
Potatos	bushel.	2	2	2	9	2	0	2	6					
Wood	cord.	10	0	12	0									
Pot Ashes	barrel.									34 4	35	0		
Hay	ton.	45	0	60	0									