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THE

Canadian Agriculturist,

AND

JOURNAL OF THE BOARD OF AGRICULURE

OF UPPER CANADA.

VOL. IX. TORONTO, NOVEMBER, 1858. No. 11

WINTER MANAGEMENT OF STOCK.

THERE is, perhaps, no part of what is designated the mixed system of husbandry of greater importance than the breeding and proper treatment of live stock. Cattle and grain most beneficially act and react upon each other. The domesticated animals of the farm, in addition to their current market value either for the breeder or the butcher, may be regarded as living machines for the elaboration of the most valuable kinds of manure for promoting the growth and maturity of the cereals and root crops; the latter of which now occupy so prominent a place in all the improved systems of modern agriculture.

Much attention has been paid of late years in Canada to the improvement of the breeds of cattle, sheep, and swine, and several enterprising individuals in different sections of the Province, have incurred very heavy outlays in importing from the United Kingdom and the neighboring States excellent specimens of the most approved modern breeds. This preliminary step necessarily involves both a heavy expense and considerable risk; and it cannot be too often insisted on that a very large portion of the benefit of such importations and subsequent improvements in breeding, must essentially depend upon the *after treatment* of cattle. The obtaining of superior animals is most unquestionably an important and expensive step; but it should be borne in mind that it is after all only *preliminary*, and that success and profit mainly depend upon the general management which is afterwards pursued.

In a climate like ours, the winter management of stock is of particular importance, and demands the most earnest attention of every improving farmer. The first considerations are *a proper supply of nutritious food and shelter.* Cattle not only require a sufficient daily amount of nutritious food, such as good hay and roots, but during our long and rigorous winters, their warm and comfortable

housing is equally essential. This truth, in the abstract, we presume, will be readily admitted by all, but in practice it is too frequently but partially recognized. In passing through the country in the very depth of winter, how frequently does one see some ill-fed and equally ill-cared for animals shivering behind a fence or some dilapidated outbuilding, incapable of affording any shelter or protection worth mentioning. We are far from insinuating that it is wrong to allow cattle to go into the open air in the day time during winter. To young, growing stock, such exercise, and even exposure,—unless in the roughest and severest weather—is undoubtedly beneficial. But at nights all kinds of stock should be put into clean and tight sheds or stables; allowing of course sufficient ventilation for the preservation of health. To cows giving milk every sudden exposure to cold draughts of air, produces a check on their milk-producing capabilities, which become rapidly diminished by repeated exposure. Many fatal diseases, especially among horses, such as inflammations of the lungs, &c., are produced by sudden exposure to the wintry blast. It is therefore vain to attempt the unimpaired perpetuation of superior breeds of any kind of farm stock, unless strict attention is paid to their proper feeding and shelter.

Chemists have, of late years, discovered that what is termed animal heat, is produced and kept up by a peculiar kind of combustion of oxygen gas, with the food daily taken into the stomach. The more therefore an animal is exposed to severe cold, the greater the quantity of its food that is consumed in keeping up the temperature of its body, and thereby the increase of growth, fat, and muscle become seriously impeded; which is the reason why stock thus exposed always exhibit a poor unthrifty appearance, notwithstanding the large amount of nutritious food they may consume.

To show the practical importance of these considerations, we may mention that we have seen many instances of animals doing well on twenty or thirty per cent of less food, when accompanied by warm housing and regular feeding. A *mixed food*, consisting of chopped hay and straw—with bran or a little meal in the shape of a warm mash—with an occasional feed of turnips, carrots, mangels, &c., a punctual supply of water, and occasionally salt, with strict attention to warmth and cleanliness, will generally produce healthy, thrifty and profitable stock; which will alike redound to the advantage, skill, and humane feelings of the owner. There is an old adage which has come down to us in connection with sacred authority, and which it is both the duty and interest of the farmer to heed betimes: "The merciful man is merciful to his beast."

To kill Lice on Cattle.—If warm weather, apply soft soap, rubbing it to a lather, and let it remain until there is danger that the hide is too much irritated—a few hours will generally suffice, or sometimes a day. In cold weather, hog's lard will prove an effectual application.

WHAT THEY THINK OF CANADA AT HOME.

A few months since the Secretary of the Board of Agriculture transmitted some fifty or sixty copies of the 1st and 2nd volumes of the Journal and Transactions of the Board, to the leading Societies and public journals of the United Kingdom, France, &c. The party who took them to England, and undertook their distribution, informs us that the volumes have already excited considerable interest, and have called forth in the public prints very favorable remarks. He says that wherever he goes, particularly in the country districts, he is beset with people wishful to obtain valuable information respecting Canada; and that by putting forth sober and truthful statements in a popular way, a superior class of emigrants might be induced to make this country the land of their adoption. Several of the public journals have published extensive extracts from the *Transactions*, accompanied by favorable remarks, a proof that our agricultural organizations have not been unproductive of benefit to the Province, far beyond its own boundaries. The honorable distinctions that of late have been conferred on several of our public men by Her Most Gracious Majesty, and the cordial reception that has been shown them by members of the Imperial Government, and prominent British citizens, clearly indicate the high position which Canada has already attained in the heart of the empire, and which it is alike our duty and interest to consolidate and improve.

We subjoin an article from the *Mark Lane Express* of November 13th, a leading agricultural paper, as most of our readers are aware, published in London:—

TRANSACTIONS OF THE BOARD OF AGRICULTURE OF UPPER CANADA, 1856. TWO VOLUMES.

Toronto: Printed for the Board of Agriculture, by Thompson & Co.

No one in future will be able to say that Governments never learn wisdom by experience, since our own came to the resolution to invest our colonists in various parts of the world with the privilege of self-government. The day has now gone by for ever when any ignorant noodle of an aristocratic family was considered good enough to govern a distant colony under the directions of as great an ignoramus as himself, in the shape of a Colonial Secretary. Because colonists are the children of the mother-country in one sense, our rulers considered and treated them as real children—babies—and kept them in the everlasting go-cart or leading strings. If they grumbled at this they were treated as disaffected; if they resisted, as rebels; and the only resource left to them was to "cut the painter" (as a sailor would say), like the American colonists, and set up on their own account. It took our wise heads nearly eighty years to study that lesson; and nothing but the danger of losing Canada altogether opened their eyes to the truth, that *any body of grown-up men know their own wants better than persons at three thousand miles' distance.* The first experiment was made in British North America, and, to the astonishment of our *Wittenagemot*, it succeeded so well, that it was extended to all the colonies, at the Cape and in Australasia, and more recently to India, where it has been equally successful. It is, however, with the first of these only that we have at present to do; and also to its agricul-

ture alone, as more legitimately coming under the surveillance of an agricultural journal.

The interesting publication we take for our guide refers only to Upper Canada, that being eminently a British colony, and exhibiting, since its emancipation from the fetters of Imperial government, a progress in its moral, intellectual, and industrial affairs unprecedented in the history of colonization. With respect to the agricultural societies of Upper Canada, their establishment, under Parliamentary enactments and patronage, dates back to the year 1830; and, from that period to 1854, nine Acts were passed for their regulation. At the former period the population of Upper Canada was only 210,000, the assessed value of property nearly £3,000,000, and the number of districts eleven, each of which had its agricultural society, with a grant of £100 from Government for its support. In 1853 the population had risen to one million, the assessed property to £40,000,000, the number of general agricultural societies to 41 (each of which has branch societies in the several townships), and grants from Government from £150 to £250 each. The aggregate sum raised by the members was, in 1856 £5,877 8s. 2½d., and the Government grants £3,198. A portion of these funds is wisely expended in the purchase and importation of breeding cattle, sheep, and pigs, of the improved breeds, the males of which are let out to hire for the season to members of the societies. Annual exhibitions are held, at which prizes (rather *too numerous*) are awarded for the same objects as in England. The impulse given by these societies to the husbandry of Upper Canada has raised that splendid province to the highest rank as an agricultural country on the North American continent.

The first exhibition took place at Toronto in 1846. It was of a general provincial character, and was eminently successful; some of the Durham cattle being of the best type, and fetching high prices. Other products, also of great excellence, were exhibited; and, upon the whole, the display excited the astonishment of those who visited the show, and were competent judges of the result. On this occasion a Board of Agriculture for the whole province was established, with E. W. Thomson, Esq., for President; and the Provincial Agricultural Association was also inaugurated, which has since been the means of so greatly advancing the general prosperity of the province. The capability of the soil of Upper Canada for improvement, was strikingly illustrated by the Hon. Adam Fergusson, by a reference to the case of Messrs. Culley, on the farm of Wark. The crop was valued to them at the rate of 15 bushels of oats, and 9 bushels of wheat, per acre. Fifteen years after, another valuation took place, when the estimate was 84 bushels of oats, 62 of wheat, and 72 of barley, the green and live stock being in a somewhat similar proportion.

Since that period the association has gone on with increasing prosperity, holding its general meetings every year; and by the encouragement it holds out to improvement in cultivation, in the management and rearing of stock, and in the invention and manufacture of agricultural implements and machinery, we ought to add, that the interest and importance of the progress made, equally increases as the society advances, from year to year. This will appear when we state that whilst the proceedings of the society for the first year occupied only forty-eight pages of the report, those of the tenth year [1855-6], including the reports of the local associations, fill up 356 pages, exclusive of a Prize Essay on "Insects and Diseases Injurious to Wheat Crops," by H. Y. Hind, Esq., M.A., a review of which recently appeared in this journal. This report, which forms a considerable and complete volume, contains most interesting matter for those who contemplate emigrating to that rising country, which will become doubly important as the future high road to British Columbia, likely to prove one of the richest and most desirable of our Colonial possessions; we might add the most

important, as lying on the Western coast of the North American Continent, and affording direct communication with India, China, Australia, and the South Sea Islands.

A great change has taken place in Canada since the boon of self-government has been so justly awarded by the mother-country. We no longer hear of those well founded complaints of mal-administration, disaffection to English rule, and threats of joining the American Union. Never, even in the "old country," were the people so happy, prosperous, or loyal. Indeed, generally speaking, their attachment to the Queen is more strong now that they are removed from the immediate pressure of royalty; and we firmly believe that in the event of a war with the powers of the Continent, Upper Canada would not only cheerfully furnish her portion of expense towards the warfare, but her contingent of men to fight the battle of their father-land. The present excellent governor, Sir Edmund Head, is the patron and supporter of every industrial institution, and the promoter of every useful national undertaking. Under his government those important works the Grand Trunk Railway and the Tubular Bridge over the St. Lawrence have been constructed at an expense of several millions sterling, which open up speedy communication between the most remote portions of British America, and will now undoubtedly ere long be extended to the shores of the Pacific Ocean. A grand future is, therefore, opening for Canada, as the highway to the West; whilst the favourable climate of the Upper Province, where the winters are shorter by five or six weeks than in the Eastern Provinces, renders it a much more desirable residence for Europeans.

England may well exult in having such a colony—such a resource for her teeming and over-crowded population; nor less ought she to do so on seeing the result of the liberal policy adopted [at the eleventh hour, it is true] towards it by her Government. "Wise and happy will that nation be," said a French statesman before the American War of Independence, "which shall first consent to see its colonies *allied provinces*, not mere dependencies of the mother-country. Wise and happy will that nation be which will consent to recognise as the only principle of consequence in commerce the employment of all its lands in the manner most advantageous to the owners, and all its labour in the manner most advantageous to the individual labourer, that is, the manner in which every man would use both of them, if he were permitted to do so, for his advantage."

Upper Canada is *the* country of the British agricultural emigrant. It is essentially English in its manners, customs, religion, language, industry, and, in fact, in all respects that can possibly render it a *home* to an Englishman tired of battling with the anxieties and drawbacks on prosperity in the "old country." It has also started into life with all the advantages of the experience of the mother-country, and full scope for their employment and development. There is, therefoar, no interval between the infancy and full manhood of the colony. As soon as the pressure of paternal superintendence was removed, it rose to its full stature at once, and showed that nothing but that interference had prevented her from sooner displaying her capabilities.

The indifference with which all Americans regard the passage of a funeral procession is proverbial. Now the French people, from a regard to the feelings of mourners, as well as respect for the memory of the dead, when they meet a funeral procession, stand still and uncover their head in the street while the procession passes. A most touching tribute to the memory of the dead. We most earnestly wish our people had the heart to imitate it.

THE PROGRESS OF ENGLISH AGRICULTURE.

Concluded from Page 228.

The spirit of the old agriculture and the new are diametrically opposite—that of the old agriculture was to be stationary, that of the new is to progress. When Young made his tour through the east of England in 1771, he remarks as a peculiarity that the turnip cabbage of a Mr. Reynolds, which had a special superiority, was gradually adopted by his neighbours—'a circumstance,' he adds, 'that would not happen in many counties.' His works, are, in fact, a narrative of individual enterprise and general stupidity. A Mr. Cooper who went into Dorsetshire from Norfolk could only get his turnips hoed by working himself year after year with his labourers, and refusing to be tired out by their deliberate awkwardness for the purpose of defeating his design. After he had continued the practice for twenty years, and all the surrounding farmers had witnessed the vast benefits to be derived from it, not a single one of them had begun to imitate him. Mr. Cooper, with two horses abreast, and no driver, ploughed an acre of land where his neighbours with four horses and a driver ploughed only three-quarters of an acre. Yet not a labourer would touch this unclean implement, as they seemed to think it, and no farmer, with such an example perpetually before his eyes, chose to save on each plough the wages of a man, the keep of two horses, and the extra expenditure incurred by the diminished amount of work performed in the day. No longer ago than 1835, Sir Robert Peel presented a Farmers' Club at Tamworth with two iron ploughs of the best construction. On his next visit the old ploughs with the wooden mould-boards were again at work. 'Sir," said a member of the club, 'we tried the iron, and we be all of one mind that they made the weeds grow.' On Young recommending the Dorsetshire agriculturists to fold their ewes in the winter, they treated the idea with contempt; and on pressing them for their reasons, they replied, 'that the flock, in rushing out of the fold, would tread down the lambs,' though no such accident had ever been heard of, 'and that the lambs would not be able to find their dams in a large fold,' though certainly, says Young, 'a lamb in Dorsetshire has as much sense as a lamb elsewhere.' Whether the method has been beneficial or not, the grounds for rejecting it were equally absurd. Of two neighbouring counties one was sometimes a century behind the other. A lazy desire to creep with sluggish monotony along an established path, and a feeling of impatience at being pushed into a novel track, helped to maintain hereditary prejudices, and tenants invented fanciful excuses for not doing what was plainly advantageous to be done, because they preferred present sloth to future profit. They were like a man who had lain upon one side till he shrunk from the trouble of turning over to the other, through when the process was performed the new posture might be easier than the old. But once roused and put in motion, and the inherent reluctance to stir being overcome, the gain in interest as well as in pocket was felt to be great. He who has profitted by one innovation is ready to try another, and his pride and his pleasure is to improve where his fathers gloried in resisting improvement. There are still large districts of England which have yet to be converted to a rational system of agriculture—landlords who are ignorant of the principles of management which attract or create intelligent tenants—and tenants who are ignorant of the methods by which the land is made to double its increase. But the wave of agricultural progress has acquired irresistible might, and they must mount it or it will sweep them away. The best thing which can be done for these laggards in the race is to persuade them to take in an agricultural newspaper, to get them to consult the commercial travellers who collect orders for the manufacturers of ar-

tificial manures, to talk them into replenishing their worn-out implements from the mart of the great makers, to prevail on them to visit the annual shows of the Royal Agricultural Society, to throw them, in short, in the way of seeing the products of advanced husbandry, and of hearing the ideas of enlightened cultivators. By some or all of these means they may be put upon the high-road to improvement, and when they have gone in inch there is little fear, unless they are afflicted by a hopeless incapacity, that they will refuse to go the ell. He who lives within the diameter of a little circle has ideas as narrow as his horizon, but the influence of numbers and skill together is irresistible, and no impersonation of ignorance or bigotry has probably ever visited a single great agricultural exhibition without returning a wiser and a better farmer.

STEAM CULTIVATION.

[Mechanical science is rapidly overcoming what have hitherto been considered as insuperable difficulties in the employment of steam as a motive power in the cultivation of the soil. The last number of the *North British Agriculturist* contains a report of Professor J. Wilson's Lecture on Steam Cultivation, delivered to the Agricultural class in the University of Edinburgh. As the Professor is well known to, and highly appreciated by a number of the leading agriculturists of this province, and the subject on which he so ably treats possesses a general interest, we are induced to transfer the report to our pages without abridgment.—*Editor.*]

The Professor intimated that he intended to confine his observations to "Steam Cultivation," because it was a question which had, he believed, a deeper and far more important bearing on the country at large than even its most sanguine supporters at present claimed for it. After remarking that the present year would stand more prominent than most in the history of agricultural progress, as that in which the great problem of steam cultivation had been solved, he said he had thought it desirable to discuss the subject on this occasion, so that it might get a little publicity by their meeting; because, although it had made wondrous progress during its short existence, still it was one entirely new to the great majority of agriculturists in the south, and to a still greater number in this part of the kingdom. He then gave a rapid but interesting sketch of the progress which had been made in the plough since primitive times, contrasting, as he went on, the rudely-constructed implement of the ancient Egyptians with the finely-proportioned broad-mould now turned out of our manufactories. In principle, however, both implements were the same, and practical men had been long turning their thoughts to ascertain whether some better principle could not be brought in to supersede what had been so long in use. The great desideratum, said the lecturer, therefore, has been to obtain a machine that shall have, like the plough, the capability of doing a large amount of work, and like the spade, of doing it in such a manner as to satisfy those conditions which we consider desirable for the purposes of successful cultivation. This twofold desire seems to have been held by the Council of the Royal Agricultural Society, when three years ago, they offered a prize of £500 for the "Steam Cultivator that shall in the most efficient manner turn over the soil, and be an economical substitute for the plough or the spade." At the Chester meeting of the present year it was decided that the problem had been solved.

The £500 prize was awarded to Mr. Fowler, while a large gold medal of honour was awarded to Mr. Smith. Noticing, in passing, the steam machines that had been constructed by the Marquis of Tweedale, Mr. Usher and others, as implements which had been of great advantage in turning public attention in the direction of steam ploughing, the lecturer proceeded to give a description of Fowler's steam plough, illustrating his remarks by a number of large and well constructed diagrams, suspended on the walls of the lecture room. The principle of Fowler's plough by steam traction was essentially different from that of other inventions, in which the plough moved across the field, carrying the shares along with it. After showing the amount of saving—in some light soils from 2½ to 25 per cent., and in clay soils from 20 to 50 per cent.—which the steam plough could effect in the tillage of the ground, the Professor noticed in succession the main features of the different ploughs that had been invented, and proceeded to consider other advantages which it possessed over the hand plough. The careless labourer can no longer scamp his work by running a shallower furrow either for the sake of less work for himself, or that his horses may look sleeker and in better condition. The furrow will be regular throughout—the width and depth throughout alike—set up at the same angle, and capable when weathered or torn down by the harrow, of forming a seed bed in which germination would proceed under the best conditions. And, better than all, not only is the subsoil freed from the lever pressure of the plough sole, but both the upper and the lower soil are tilled without the trampling and kneading of iron shod hoofs—harmless it may be on light sandy soils, but wofully injurious on the moist loams or tenacious clays, which are the steam plough's own domains. The steam cultivator breaks up and pulverises the soil far more effectively than could be done by mere horse-flesh, on account of the continuous and equal force it applies, and the rapidity with which it moves. No animal power could be used in such an unconcentrated form, neither could we, by any other means at present known to us, leave the torn and displaced soil in such an open condition, and so suitable for the action of drainage, and the subsequent processes of cultivation. But it is in deep tillage, and on the strong clays, in work too heavy for the ordinary strength of a farm, that our new friend shews to greatest advantage. The heavier the draft, and the moister the soil, the more our teams pull at disadvantage to strength, and the greater the relative cost per acre—and there is a limit to the power of horses which we can profitably employ. The Professor also pointed out its great advantages in saving time, and allowing the farmer to seize the opportunity of a favourable break in the weather for prosecuting his ploughing, without the vexatious delays to which he was at present exposed. In getting in spring corn between the catching showers of February, March and April, how much, he said, would the average yield be raised, and the success of the crop be secured, by a machine that could reduce weeks into days, and begin its work before a horse would be allowed to put his foot upon the soil. What proportion of our root crop is backwarder and inferior in bulk to the rest, for want of having been able to get in all at that golden moment when the best portions were sown! One of the boasts of drainage was, that it rendered the farmer independent of the seasons; but it remained for the steam cultivator to complete his independence, by giving him the power to choose his own time for his necessary tillage operations. Again, on light soils, where the climate gives an early harvest, advanced farming claims more than one crop a year; it is simply want of power to carry out the processes of preparation quickly enough that limits the spread of so desirable and so profitable a system. Then the rapidly increasing practice of autumnal cultivation, for which our leading farmers are providing themselves with steam machinery, scarcely looking for any further advantage from them. After the clover leas and spring corn stubbles are

prepared for wheat sowing, there are the wheat stubbles to be fallowed for the green crops, usually a tedious and costly affair—with winter and spring ploughs, scarifyings, draggings, rolling and harrowings, before a satisfactory tilth is obtained, and all the couch and other weeds got rid of; while on many strong clays a whole year's fallow is necessary before the necessary conditions can be secured. But an autumn day's dry tillage, when the root weeds are young and weak, and the temperature of the earth and atmosphere high, is of far more value than a week's work after the cold and rains of winter; and with the cultivator in its various forms we can pulverize the soil with the efficiency of the old Roman plough, and leave it either open or ridged up to the mellowing action of the still powerful sun. We may fairly expect by autumnal cultivation to save two ploughshares in the fallowing—the land is kept more clean and at a lower cost—moisture is retained in the turnip land by avoiding tillage during the drying winds of the spring—and on clay soils a root crop is obtained upon part of the otherwise bare fallow; yet only under the most favourable circumstances and in but few localities, can this advanced and desirable system be carried out successfully, owing to our limited power and the pressure of other operations. So that steam cultivation was, as it were, a new faculty, cleansing and preparing our land at a reduced cost, fertilising it by autumnal exposure to the sun and air, forwarding the preparation for our spring seeding, and placing within our reach profitable crops, which hitherto have been comparatively unattainable. This is no imaginary picture; it may be seen as the result of a four years' practice by Mr. Smith at Woolston, where a strong and cold clay farm of the most pauperising character under the old system, has been converted into a soil, "deep, rich, absorbent and friable as a garden." The ruinous dead fallow is abolished, yet the farm is a pattern of cleanly culture; and, without purchased artificial manures, very heavy crops of roots and grain are grown with a produce and a regularity quite unknown before. This change has been effected by his new system of steam cultivation, which has produced him a regular increase of at least eight bushels per acre, while the entire cost of preparing his land for seed has been (on the average of the four years) only 11s per acre. Mr. Mechi tells us that he has found a like increase on his heavy open clays due to the employment of Fowler's steam plough; and in some light soils in Suffolk the effects were equally satisfactory. The superior power of steam to horses in time, in force, and in cost—all and each of deep importance to the farmer—would be more readily recognized were we to give a little more consideration to the cost of horse power than is usually done. Hitherto our trials have had reference to the comparative merits of the implements used, and important results have been obtained as to their relative drafts in the same soil. What we want now is to ascertain the comparative resistance of different soils, and then calculate the cost of draft per acre in each; this would give at once a clear notion of the important part that steam is likely to play in our field operations. We have a good starting point for our calculations in the known value of the draft force of a horse. Every one knows the enormous difference in the texture of our soils, which our somewhat imperfect dynamometers have shown us to have a range of draft of from 2 cwt. to 12 and 14 cwt. for the 6 by 9 furrow; and yet few of us have correct ideas of the different cost of Norfolk and Kent ploughing, or of the increasing ratio of expense, where the resistance exceeds that which horse-power can economically overcome. The draft power of a horse in ordinary condition is estimated at 1¼ to 1½ cwt. Let us take the maximum, which would show us that a soil offering a resistance of 3 cwt. was a fair test of a pair horse power, and that they would readily do such work without extra keep and without losing condition. Double this draft, and make your horses struggle through it and what is the result? Either they must do a considerably les

amount of work in the same time, or they must consume an increased amount of food, or they must speedily show by their depreciated condition the wear and tear which has been silently going on by the uneconomical expenditure of their powers. Force cannot be generated—it must have its equivalent somewhere—either time or material must be given to balance it; and either or both of these must be paid for somehow. From my own calculations, I am inclined to think that the money equivalent of horse power 6 by 9 furrow per acre in ploughs is about 2s 6d per cwt. of draft on the lightest soils; but that this ratio of costs increases with any increase of resistance offered. Now, if we could draw out any scale of this sort, it would readily be seen upon what soils horse power could economically be employed, and where steam could be introduced with advantage in the cultivation of the farm; for steam, we must recollect, owes no allegiance to the laws which limit animal power. Our trial experiments so far are in accordance with our previous ideas—that on light soils steam exhibits but a small advantage over horse power, so far as mere cost is concerned, but that on medium and heavy soils its great economical advantages are seen increasing as the natural difficulties of the soil increase. The vast strides, said the lecturer, which agriculture has been making during the few past years in all the processes and operations of the farmstead and of the field, in the economical manufacture of both animal and vegetable food, have stimulated our engineers to assist us in compelling our fields to pay an increased tribute to the increased intelligence and requirements of the day, and have prepared the master minds of her followers to receive steam cultivation as one of the most important and acceptable offerings that could be made to her. Already the white flag of steam tillage may be seen flying in various parts of the country, and each inventor as he brings his machine into successful operation in the fields, finds no lack of encouraging purchasers. Let the memory run back but a short fifty years, and note the changed condition of our fields. The careworn soil may indeed deplore the days of easy farming and long idle fallows—it has since then known no rest. For ever knocked about, it never knows in what form to expect its next blow. Its surface forced to wear a regulation garment of everlasting green—drained of the moisture it treasured in the depths of its old lazy content—pierced with fistulous passages of miles of hard piping—submitting to all sorts of rough treatment, scarifying, crushing, drilling—ploughed, and harrowed, and rolled, to the utter confusion and pulverization of its clod existence—every kind of horrible compound that fish, bird, man or beast can conjointly or severally furnish, driven into its texture—when early clothed with nature's youthful verdure, soused, irrigated, and polluted with liquid extract of solid nastiness. Though thus abused, and under a constant screw, it has proved grateful; it has shown its powers to be equal to the requirements of the day—to meet low prices by quick returns—and has met the lessened value of its productions by a continued increase in the amount produced. We have seen steam, too, leaving its factory-home and enlisting in the service of the farm; and our new and faithful ally has been welcomed far and wide, and has found a home in the farmsteads of well-nigh every county of the kingdom. In the early days of our acquaintance we tried its powers with natural hesitation and diffidence both of our own wants and of his strength; but as our acquaintance improved, and we could better understand its value, we threw aside our reserve, and confided to it the important conversion processes of the steading, and grateful for the benefits it has conferred on us then we now, with an increased confidence, intrust to it the still more important production processes of the field. Let us then aid its progress as much we can within our respective spheres, confident in the belief that the day is not far distant when it will justify its claims to be considered as the greatest in its results of all the advances which have from time to time lent a hand in revolutionizing the agriculture of our country.

THE PROGRESS OF AGRICULTURE IN GREAT BRITAIN.

Mr. Philp's history of Progress in Great Britain, is a most interesting work, abounding in curious research and important suggestions. The following is an extract from the Agricultural section :—

Commencing at the earliest period of British history, we are carried through the different ages of alternate advance and retrogression, thus rendered by the existence of peace or war. The most baneful periods to agriculture were those of the civil wars, which appear to have paralysed every effort for advancement in any art or science. The agressive wars, too, of Edward III. and Henry V. were highly injurious to the progress of agriculture, by the constant draining off the rural population to supply the ranks of the armies in France. It was not, however, till the beginning of the sixteenth century that agriculture received any attention beyond that of the yeomen themselves,—the pursuit being held as almost contemptible. But about this time several books appeared on the subject, the earliest of which of any importance was "The Booke of Husbandrie," by Sir A. Fitzherbert, published 1534. In 1562 a very curious work by Martin Tusser, entitled "Five hundred points of Husbandry," appeared :—It was printed in black letter, and from this we will give the same extract as Mr. Philp quotes, it proving that a succession of white crops was even then considered injurious to the land :—

"Otes, rie, or else barlie, and wheat that is gray,
brings land out of comfort, and some to decay:
One after another, no comfort betweene,
is crop upon crop as will quickly be sene.
Still crop upon crop many farmers do take,
and reape little profit for greadinesse sake."

In this way, with much quaintness, the rules of husbandry were given, and few then known omitted. Mr. Philp remarks that "Great stress was laid by the olden writers upon the effects of the moon and wind. In Goodge's 'Booke of Husbandrie,' 1577, farmers are told to 'look that the wind be westerly, and the moon in the wayne;'—and another work, 'The perfect husbandman,' published 1657, says, That the observation of the moon and the wind helpeth greatly to the bettering of the ground.' The aid of chemistry in those days was never thought of: to charms, witchcrafts, and sorcery, either good or ill success was attributed." After taking us through the history of agriculture up to the end of the seventeenth century, the author concludes this interesting work with some excellent observations on the advancement made during the last half century, and deducing therefrom valuable statistical information. The work is well printed, and abounds with richly-executed illustrations of plants, animals, and machinery.

In Young's time, farmer's very rarely ventured beyond the boundaries of their own locality; the market or the fair were their chief opportunities of intercourse, and there was too much eagerness to sell or buy, too much excitement from beer, to enable them to discuss anything of an improving tendency. Besides, the farmer was a man of prejudices; he would scarcely look over a hedge to watch the progress of an experiment. When the father of Mr. George Turner, of Barton, Devon, the well-known breeder of Devon cattle and Leicester sheep, who had learned something in his visits with stock to Holkham, began to drill turnips. a well-to-do neighbor looked down from the dividing bank, and said to his son, "I suppose your father will be sowing pepper out of a cruet next!" Jethro Tull said, that the sowing of artificial grasses was so long

before it became common amongst farmers, that though Mr. Bilth wrote of it in Cromwell's time, yet thirty years ago (about 1770) when any farmer in the country was advised to sow clover, he was certain to say, "Gentlemen might sow it if they pleased; but they (the farmers) must take care to pay their rent." And now the case is so much altered, that, though rents are increased, and the profit of clover is less since it has become common, they cannot pretend to pay their rent without sowing it.

MISCELLANEOUS.

AUSTRALIAN FLOWERS.—The native rose has the color but no other resemblance to the European queen of flowers. It is one of the few field flowers possessing any odor. Wafted on the passing gale, it commends itself pleasantly to the senses; but strange enough, on closer acquaintance, there mingles with the rich perfume an undoubted smell of fox—a scent which, however productive of rapture in "the field," is hardly adapted to the boudoir. In the low lands of the Botany scrub I noticed a crimson and orange flower, like the foxglove in form, very handsome, but so hard and horny in texture, that the blossoms actually ring with a clear metallic sound as the breeze shakes them. It might be the fairies' dinner-bell, calling them to dew and ambrosia! But alas! there are no "good people" in Australia! no one ever heard of a ghost, a bogle, or a fetch, here.—*Mundy's "Our Antipodes."*

THE HAPPY FAMILY.—Conversing with the proprietor of the "Happy Family," which stands on Waterloo Bridge, London, I was informed that this exhibition had been in his family upwards of thirty years; and that the mode he got the animals to agree was by placing always young ones in the cage in the place of those who died. The mapie was the patriarch of the cage: he had had this bird five years, hopping about and chattering. The next to the magpie was the starling; he had been in the cage two years. He left all the creatures in the cage together regularly every night—owls, rats, rabbits, jackdaws, dogs, &c.; but he was obliged always to take the monkey out, and put him in a different place, he was so very mischievous, and kept all the other animals awake, teasing them when they were asleep. "Ah," said he, "them monkeys is awful blackguards."—*Buckland's Curiosities of Natural History.*

A HARD AND DURABLE SOAP.—A patent has been granted in England for an improvement in the manufacture of soap, by the addition of sulphate of lime to the usual ingredients employed in its manufacture. The sulphate may be added with any of the usual ingredients employed in the manufacture of soap. The proportions of the sulphate which it is best to employ, vary according to the article manipulated upon, and the quality of the soap to be produced. Thus about twelve ounces of dry sulphate is sufficient for one ton of best soap, whereas, in common or highly liquored soap, six or eight pounds may be used with advantage. Soap, made with the addition of sulphate of lime becomes hardened, keeps dry, and is not liable to shrink while in water, its durability is increased, and it does not wear or waste away before its cleansing properties are brought into action.—*Scientific American.*

SCOTCH SNUFF VS. GREEN-FLY AND THRIPS.—I find accidentally that a slight powdering of common Scoth snuff destroys green-fly and thrips. I should feel obliged if you would say whether there is any objection to the use of it generally. [None, except expense.] I ask because so much has been written lately about the aphis powder that I conclude there must be some good reason against

the use of snuff, in itself the cheapest and easiest used powder, unless its subsequent effect on the plant is injurious. One ounce of Scotch snuff administered by a pepper castor will go a long way in a green-house, and any one who will try it upon a bud or young shoot covered with the well known pest will have at least the satisfaction of seeing the whole force of the enemy strewn on the surface of the pot in about five minutes, unless you decide that it is dangerous.—*London Gardener's Chronicle.*

GATHERING FRUIT BY MACHINERY.—William Doty, of South Hartford, New York, has invented an apparatus for gathering and sorting apples. They are shaken from the tree by a pole made to grasp the limb. As they fall they are caught by an inclined cloth, stretched on a frame, through an opening in which they pass to a grating that retains the larger apples, which are drawn through a spout into bags or barrels. The smaller apples drop gently on a lower grating—through which the sticks, leaves, and other foreign substances can pass and allow the apples to roll down a spout. Should the apple not be very regular in its form, it will not roll from the grating, but will stay upon it to be removed by hand—thus the apparatus will only deliver such apples as are marketable, and divide them into sizes fit for the same. This invention will interest our fruit cultivators, as it is one of the most difficult of things to gather apples so as to have them fit for long keeping.

GEOGRAPHY OF PLANTS.

Wonderful and beautiful is the variety which marks the vegetable world! Were all vegetation confined to one single species, as the mullein, the dog-fennel, or even the beautiful and useful wheat plant, how soon the mind would clog of their charms and nervously turn away for some new plant whose other form of stem, of foliage, or flower might bring relief and a new joy to the weary eye. But such it is not. Nay, on the contrary, so great is the multitude of varieties that botanists have not yet been able to number them—thousands and hundreds of thousands have already stood for their portraits, and every day rewards the eager search of some zealous naturalist with a new discovery. And then the extent of this variety! From the dear little blue-bell on rocky crag, far from the haunts of men, to the earth-screening Banyan and grand old Baobab whose germs began to swell under the sunlight of the first roseate morn, and whose grateful shadows have been lovingly spread ever since for the laughing sports and idolatrous worship of untold generations, how infinite the variety of color, form, and use!

But not all of these belong to the same locality; as all classes and families of men are not to be found in any one country—except America! Nevertheless the distribution is not of chance but had its origin in certain necessities of soil and climate and in the special wants of the people and animals destined for the various portions of the earth.

If the Creator had made the earth perfectly even on its surface, with the water and land arranged in alternate belts, and perfectly homogeneous in its chemical constitution, then the climatology of the world would have been comparatively simple and the Geography of Plants a mere question of latitude or longitude. It so happens, however, that neither one of these conditions is true; for so far from being perfectly smooth and even surfaced, the earth is exceedingly rough and irregular in the distribution of land and water; and instead of homogeneity, there is no single handful of its substance of one kind, unless it be here and there a lump of one of a few metals which occur pure. Everywhere there is the greatest diversity, both in the general configuration, and in the chemical elements of which the earth is composed; no two square miles of the earth are exactly alike, either in the character of the surface or the nature of their constituents.

It must be apparent, therefore, that the problem of distribution is complex and difficult, requiring in order to its complete solution a perfect knowledge of Geology and Mineralogy, Botany, Chemistry, Physical Geography and Meteorology. Accordingly,

it was not until the great mind of Humboldt, with its wonderful power to grasp the cosmic relations of material things, devoted itself to the task, that anything like a philosophy of distribution was offered to the scientific world.

The materials had been brought piece-meal to the feet of this great man, whose work it was to build out of them the splendid fabric of a great generalization. But even he has as yet been only able to lay the broad foundation upon which the scientist of the *future must rear the superstructur. of a complete science.*

It was natural in the beginnings of botanical science that the description of every new plant, whether new to the world in general, or only in the particular locality, should be accompanied with a mention of the place where it was found, although no reference whatever was had to the deduction of a general law. Thus it was found that a certain class of plants were chiefly confined to a definite zone, or still narrower range, sometimes even limited to a small circumscribed locality, never being found elsewhere or susceptible of easy cultivation in any other part of the world, however like the place of its habitat. For instance, of the numerous species which grow in New Holland, very few are found in other parts of the world; while of the sixty-three or four peculiar to St. Helena, only two have been discovered elsewhere. So also, it sometimes occurs that upon the two sides of a given range of mountains totally different varieties of plants are found; from all of which facts it will appear that the vegetable world is really much less independent of circumstances than the animal—it seeming to have been the intention that animals being gifted with powers of locomotion should seek such localities as furnish the food to which they are partial. True, we have the power of manufacturing a given climate to order, on a small scale, but the uses of such artificial climate can never be more than very partial and imperfect; the exactions of nature are rigid, her *claims imperative.*

The nature of the relations which subsist between the vegetable and the animal kingdoms, and the joint relation of both to the climate where they are native is one of the most interesting studies in the whole range of natural science, and might with propriety be noted in this connection; we are not willing, however, to embarrass our present subject with any discussion not strictly essential to its completeness, and shall hence defer it to the general department of Uses of Plants.

The important discovery of Humboldt that the parallels of latitude do not demark either zones or more specific climates was the first great contribution to the science of climate, and gave rise to what are now known as *isothermal* lines, (lines of equal annual temperature,) *isotheral* lines, (lines of equal summer heat,) and *isochimenal* lines, or such as pass through places on the earth whose mean winter temperature is the same.

To any one accustomed to associate a definite climate with a particular degree of latitude, the tortuosity of these several classes of lines will be an occasion of no little surprise. Sometimes in their windings they cross several parallels and then suddenly and by an almost due north or south course return to the parallel of departure, or, even crossing it, deviate as far in the opposite direction.

Now so far as these lines are concerned, they are quite satisfactorily explained upon the ground of *the physical configuration of the surface—and the astronomical lines* which govern the earth—mountain ranges, lakes, rivers, plains, &c., &c., all have a modifying influence, and to the man of science determine what must be the nature of the vegetation of any given locality.

To illustrate briefly:—Every one familiar with the mass of the world and the general botany of the old and new continent must have been struck with the fact that fruits and grains belonging to the temperate zone grow much further north on the western coast of Europe than any on the eastern coast of America. Indeed so almost identical with the fruits of New England are those of Great Britain, that many, who have not reviewed their geography for some time, find it difficult to believe that the parallel of latitude which just touches the southern coast of England is the same which passes through British America, some two degrees above the extreme northern limit of Lake Superior. A proper understanding of Physical Geography, however, renders the explanation quite simple, as follows: Owing to the spheroidal form of the earth, its revolution on its axes and the peculiar relative position of land and water there exists what is known as the Gulf Stream, whose warm waters moving in a north-easterly direction from the Gulf of Mexico wash the western coast of England and thus raise its temperature above what it would otherwise be; while on the other hand the eastern coast of America is washed by the cold waters and influenced by the cold winds from the regions of Iceland and Spitzbergen; thereby reducing the temperature considerably

below that which might otherwise be expected. So that in this case we have two opposite causes conspiring to increase the difference between the climates of the two countries.

In like manner smaller bodies of water, as inland seas and lakes, exert a modifying influence, as we who inhabit the northern tier of States can testify from our own observation. Prairies, highlands and forests also enter into the problem of climate, and while they render it when irregularly arranged, more difficult of solution, yet if properly understood in their individual influence, will enable the climatologist to explain many anomalies in the Geography of Plants. This branch of our subject will be discussed, however, under the head of cultivation of Plants, and may, therefore, be dismissed for the present without further remark—only, that certain specialities in the distribution of plants appear to involve unknown quantities or elements, the determination of which is essential to a complete understanding of the subject. Indeed it is probable that not until more is known of certain intangible elements, and the mean temperatures of localities for less periods than years and half years, many questions of interest and importance must wait for an answer.

If it be true, as we have attempted to prove, that the sunbeam is the motive power which drives the machinery of the great vegetable world, then we should naturally look for the most marked results in these portions of the earth where the intensity of this force is the greatest and where it is most persistently applied. In other words we should expect to find the vegetation of the equatorial regions, where the sun's rays fall most perpendicularly, and operate therefore with concentrated force, the most luxuriant, and a gradual dwindling down in thriftiness of growth as we approach the polar zone. And such is really true; for the tropics display the most luxuriant growths in the world.

It is there that the magnificent Ferns and Confervæ shake their evergreen leaves, and shoot toward heaven, and the over-topping Palm waves its tufted coronal high above the other trees of the forest, and there that the Dragon-tree stands suggestive of centuries that have been. No billowy meadows of tender grass carpet the heated plains, for under the powerful stimulus of the tropical sun, every plant aspires to be a tree!

But gradually this luxuriance diminishes, so that proceeding poleward, the Palm dwarfs a little, gradually becoming less and less until at last it altogether disappears. Still there are great forests of evergreen trees, around the mighty trunks of which are trained the Vine and fire-tinted Bignonias; Crucifers and beautiful Rock-roses abound, and the gorgeous colorings of equatorial plants assume more modest hues.

Next we reach the zone which is mixed of the deciduous and ever-green woods, whose sombre hues contrast so beautifully with the bright, soft green radiant meadows; rich mosses, hitherto unknown, here clothe the trunks of aged trees; leaf-buds before unprotected assume *tegmenta* or coverings; but Lime and Orange groves are there for the refreshment of thirsty man and the Hop and Clematis twine the sturdy stems of giant growths.

Then come the lofty graceful Elm, the massive Plane and Cotton-wood. Among the grasses the Rice-plant holds important rank, furnishing much of the food consumed by the inhabitants of that semi-tropic, semi-temperate zone. A little higher still, Oak also begins to appear, and the drooping Cypress. Corn and the Sugar-cane have their best development, and the garden fruits of the summer of more northern latitudes offer their tempting food in the middle of winter.

Even as far north as the 30th parallel, Nature plies her work from the beginning to the end of the fruit-burdened year, nor ever thinks to stop for rest or sleep. Corn and the cane are important products of her toil, and here she prepares her sweetening for the world of men.

Next we meet—at least on the American continent—with the Beech, the Hickory, the Walnut, the Ash, the Oak, and the Butternut, the 40th to the 50th parallel being their true habitat, although some of them, particularly the Oak and the Beech, are found as far north as the 60th. It is within this range, also, that the cereal grains have their most natural growth. Wheat, oats, barley, rye and Indian corn are the chief products of the field; the last mentioned flourishing, as said before, considerably further south, while the first and third may be, with some difficulty, produced as far north as latitude 65°. This belt of earth also includes the Vine, whose extreme northern limit is the 55th parallel. The Birch, the Larch, the Pine and the Fir are the principal forest trees along the upper skirt, and even these begin to dwarf after the line of 60° is crossed.

Approaching the pole more nearly, the tree becomes the shrub, and finally the shrub dwindles down until the whole of vegetation consists of a few species of Lichens, Mosses, and the Red Snow Alga is alone left to bedeck the wide wastes of ice-covered plains.

Such is the birds-eye view of the Geography of Vegetation, highly interesting in itself, and a thousand times more so when viewed in its relations to the animal kingdom. In our next, we shall enter upon the practical subject of the cultivation of plants.—*Wisconsin Farmer.*

THE GRAPE VINE.

BY THOMAS BAYNES, OF BALTIMORE.

Soil.—The natural soil most congenial to the growth of the vine, and the perfection of its fruit, in this country, is a light rich sandy loam, not more than eighteen inches deep, on a dry bottom of gravel or rock. No subsoil can possess too great a quantity of those materials; for the roots of the vine run with eagerness into all the clefts, crevices, and openings in which such subsoils abound.

In these dry and warm situations the fibrous extremities pushing themselves with the greatest avidity, and continually branching out in every possible direction, lie secure from that excess of moisture which frequently accumulates in more compact soil.

It may hence be inferred, that vines will not flourish in a cold wet soil, nor in one composed of a stiff heavy clay. In preparing the border then, the first thing is to secure a dry bottom. If the soil and subsoil be naturally such as described above, as most congenial to the growth of the vine, nothing more is required than to trench the ground three feet deep, and two feet wide, and place in the bottom of the trench six inches of bones, horns or hoofs; clean it of all weeds, and it will be in a proper state to receive the vines. The trench should incline a little, to carry of the surplus water.

Manures.—As a border in which vines are to be planted ought never to be disturbed after having been once properly made, it follows that those manures that can be applied with advantage to promote their growth, comprehend—first, such as can be mixed and incorporated with the soil at the formation of the border, and which add to its fertility from time to time, according to the respective periods of their decomposition, and amalgamation with it; and secondly, such as can be applied in a liquid state or otherwise as a top-dressing at any subsequent period. Of those manures, therefore, that may be mixed with the soil when the border is first made, the best are such as possess the two valuable qualities of affording to the roots of the vine, the highest degree of nourishment combined with the greatest permanency of duration. Of this description are bones, horns and hoofs of cattle. Every variety of size may be procured from the smallest bone of a fowl, to the largest bone of an ox. For the purpose of top-dressing, soap-suds should be used as fresh as possible, in order that their good qualities may be preserved entire.

Planting.—The best time of the year to transplant a vine is immediately after the fall of the leaf. The ground in which it is to be planted must be prepared agreeably to the directions given above; this being done dig a hole for the reception of the vine about two feet deep, and of the same width and length; and if, after the plant is taken up, its roots should prove too long for this, the size of the hole must be increased, as, on no account must the roots be crippled in their extension.

Loosen the sides and bottom of the hole, and to the soil that is taken out, add a couple of spits of well rotten dung, and mix the whole well together, making it very fine. Put the mould into the hole again to within nine inches of the top, and it will be ready to receive the vine. This must now be carefully taken up, with its roots as entire as possible, and if any of them be bruised or in any way injured, they must be pruned back to the sound parts. Fix the vine in the hole with its stem about six inches from the wall, and let the bottom bud be just even with the surface of the ground. Spread the roots out in a horizontal direction, at equal distances from each other, and in a similar manner to the spokes of a fan, then fill the hole with the mould nearly to the top. Take hold of the stem and drawing it upwards a little, give it two or three shakes with the hand, that the mould may settle well around the roots; after which fill

up the hole with the remainder of the mould; cut the vine down to the two bottom buds, and the operation will be completed.

In the fall of 1855, I bought of Wm. Course, grape plants two years old, at twenty-five cents each, and planted them in borders prepared as described, and cut them down to the second bud from the ground. In 1856 I pinched of all the fruit on first appearance, and in the fall cut them back to about seven feet. In 1857 allowed them to bear about ten bunches each, and in the fall, cut away about one-half the new wood.

This year (1858) I have sold the grapes of five vines for $15 (each vine occupying 8 feet each way, making 64 feet) which is equal to $2,041,87½ per acre, per annum.

CLOVER.

Clover has an importance to farmers which can scarcely be over-estimated, and we fear it does not receive a sufficient consideration. As furnishing a large amount of excellent pasture and fodder for domestic animals, and as a means of keeping up the fertility of our farms when ploughed under, it deserves a prominent place in the system of rotation adopted by those who follow either a mixed or a grain growing husbandry. As a general rule every acre of winter grain should be "seeded down," as it is termed, to clover in the spring, to remain for at least one, and not more than three years as a meadow pasture.

The soil best adapted to the clover plant is that of a somewhat clayey character—such as will produce the best wheat crops. Any soil which will grow wheat will also produce clover. A deep well drained loam suits it well—on all ill drained soils it suffers much from winter killing, especially if the spring proves one of little snow and variable temperature. On light soils it needs the assistance of manure to prove profitable.

Clover is usually sown early in spring upon winter grains, and occasionally with oats and barley. With the latter it generally does well, especially if sown in good season. Upon wheat we sow in March, when the season is sufficiently advanced to do so. While the light frosts continue, the slight cracking and heaving of the soil through their action, will generally furnish a sufficient covering for the seed, though some recommend sowing later and harrowing in, arguing that this process not only covers the clover more perfectly, but benefits the wheat crop. When seeding with spring grains, it is usually sufficient to pass over with the rollers, sowing the clover seed after the last harrowing.

The benefit which clover derives from plaster seems a "fixed fact in agriculture," not needing special remark in this connection. Hence they have been associated in the minds of most of our farmers as partners in the product desired, and the one usually accompanies the other. We think, however, that the sowing of plaster upon wheat fields seeded to clover is frequently deferred too late. The clover needs its aid, when it first comes up, besides if sown late, the wheat is injured by its causing too rank a growth of straw at the time when the grain is forming. We should sow plaster as early as April, if possible, upon wheat, and upon spring grain seeding as soon as it fairly appeared above the ground.

The amount of seed necessary for an acre depends upon the character of the soil, but there seems no disposition to seed too heavily. Loamy soils need less than clayey, and the growth of the crop with which it is seeded, whether large or small, have considerable influence. A peck to the acre is little enough—some use more, but many less. It is poor economy to sow but half enough to cover the surface—the pasturage and hay are of less value, and the saving of five dollars in seed often entails a loss of five times that amount in the product.

There are many varieties of the clover plant, but those most grown are the common red, or Northern clover, of which we believe there are two varieties—the large, or pea-vine clover and the medium—as it is called, perhaps from its lying between that and the Southern or small variety. The medium kind makes the best hay and is equally valuable as a green manure.

We have already remarked upon the great value of clover for this latter purpose. Some of the reasons why it is so may be thus briefly stated. Clover takes less from the soil and more from the atmosphere, in proportion to the feeding and manuring value of its products, than most other plants. It has numerous roots, long, bulky stalks, and abundant leaves, each supplying vegetable matter to the soil. A luxuriant growth of clover is an excellent preparation for any and every crop. Its far spreading roots loosen and deepen the soil, and bring to their support and to their surface the elements of fertility below the reach of most other crops. This, too, is the reason why clover delights in a deep fresh soil, and why, after subsoil ploughing, it is so certain to succeed.

THE CULTIVATION OF FLAX.

From the Protectionist.

The cultivation of flax seems to meet with very general favor, probably from the fact that many old country farmers are acquainted with the raising and preparing of that article, and there can be no doubt that if the agriculturists of Canada were assured of a steady demand, the cultivation of flax would be largely engaged in.

In the annual address of the Vice-President of the Agricultural Association of Upper Canada, Mr. Fergusson thus spoke of the advantages to be derived from the raising of flax in this Province:

"When we examine the trade and customs' returns of the Province published by the Government, we find that cotton goods, in a variety of forms, are annually introduced into the country, not only from England but from the United States, in such quantities, and of so great an amount in value, as to cause astonishment at our supineness in continuing to encourage a foreign material which draws so heavily upon the industrial resources of the country—the annual importations exceeding five millions of dollars. By substituting for cotton, where practicable, a fabric of our own manufacture composed of flax, to supply us in the many uses to which cotton is applied, a great portion of the very large sum of money would be annually saved to the country, and a new branch of industry created among our people and its manufactures, by means of which a new market would be established for a considerable amount of our surplus provisions, and also profitable employment secured for an increased and thriving population."

Of the importance of the article of flax to the manufacturer, as well as to the agriculturist, Professor Wilson in his able lecture alluded to, showed that at that period, "England had at work 168,000 spindles in its manufactures, while the United States had but 50,000." but were, as he remarked "rapidly increasing." And he adds "that out of twenty millions of yards of linen annually manufactured in England, eight millions had been sent to the American continent," showing thereby the importance to us of encouraging the growth and manufacture of this most useful material. And the learned gentleman, in showing the large amount of foreign raw flax used, further says, "that for the production of the quantity of raw material annually imported into England, it requires the growth of 800,000 acres of land.

It is ascertained that the flax plant will grow to perfection where cereal crops can be cultivated; and with even less exhausting effects to the soil than that of wheat; but the apparent difficulty to the grower, is the want of necessary modern machinery for producing the putrefactive fermentations, or rotting process; which might be of such construction as to be capable of removal from place to place, as most of our threshing machines are, and by which means the raw material could be cheaply prepared for the manufacturer.

Should its manufacture into the finer and more costly articles of commerce, not be obtainable at present, for want of enterprising capitalists among us, or through a deficiency of labor, by proper encouragement given to flax culture for export only—now that we have ocean steamers coming to our very doors—a new opening for the enterprise of our people presents itself, which would be found more remunerative than the growing of wheat under the present circumstances; and its adaptability for exportation when merely rough dressed or scutched, and being much less liable to injury in its transport across the seas than cereal crops, gives it a decided advantage for ocean transit.

In estimating the comparative advantages over the many other productions of the field, that those obtain who are engaged in the cultivation of flax as a staple, many instances might be adduced, but the following statement from the *Irish Farmers' and Gardeners' Magazine*, shows the fact to be indisputable:

A Mr. Woltenhohen sowed in the month of April fifteen Irish acres with Dutch flax seed. These fifteen acres produced 245 bushels of excellent seed, or 23 bushels per acre, worth 7s. 6d. per bushel	£129	7	6
He had of scutched flax, 6 tons 11 cwt. 1 qr., or 1050 stones of 14 lb., each worth 7s. 6d.	393	15	0
Making in all	£522	2	6
Or per acre	£ 34	7	6

It may not be out of place to mention here, that Ulster, the most northerly of the four provinces of Ireland, still maintains by its flax and linen trade a population exceeding two millions, notwithstanding the very large numbers who have emigrated from that section of the country.

Among the many causes why the Canadian farmer could make not only the growth of flax, but also its manufacture into linen profitable, we have the certainty of four months' winter, during which period very little out-door occupation engages the time of the farmer and his family. This season of the year could be profitably employed in preparing the raw material for the manufacturer, and where it might be deemed advisable to use the hand loom at home, what more fitting season for such employment than our dreary winter's days and evenings, where by the comfortable hearth, the busy hum of the spinning-wheel, and the lively motion of the weaver's shuttle, would, besides the pecuniary advantages it would bring, give life and animation to that season of the year when the out-door world presents but a dreary sameness, and the vegetable kingdom seems touched with the finger of death.

If in her future destiny Canada expects to succeed in maintaining a self-sustaining position, when brought into competition with those of the extensive wheat growing prairie lands of the western region, aided as they soon will be with all the modern appliances of steam ploughs now being so effectually used in England, (and certainly well adapted to the prairie country,) she must eventually look to the resources which her magnificent water powers present for manufacturing purposes, and bring them into use as auxiliaries towards maintaining her progress and position among the surrounding state and colonies.'

The people of Canada owe Mr. Ferguson a debt of gratitude, for this bold and fearless exposition of his views, in favor of encouraging the home industry of the country. There still remains the question, where shall the farmers find a certain and profitable market for the flax and flax seed thus shown to be so profitable in Ireland? At present our farmers raise a little lint for the seed, and leave the flax to rot, or send it to the paper mill. With this prospect before them, we fear it will be impossible to induce any considerable number of agriculturists to abandon the raising of wheat for the cultivation of an article, for which there is little prospect of finding a market. The great object to be attained is a ready market, at remunerative prices, for every stone of flax offered for sale. Were its cultivation once established, capital would be attracted for the purchase of both the flax and seed; but something must be done at the outset. At the risk of being charged with a desire to return to the bounty system, we would propose a plan by which the Government might encourage the growth of flax without expense to themselves and with manifest advantage to the country. Let the Government establish warehouses in Quebec, Montreal, Kingston, Toronto, and London, for the receipt of flax, and appoint well qualified persons to receive and examine the same, and to grant receipts for the quantity delivered, describing the quality according to a scale to be agreed upon.

These receipts to state the quantity and quality of the flax, to be payable six months after date at the current price of flax, less a certain per centage for freight and commission, &c., and to be negotiable instruments passed from hand to hand without endorsement. They would thus obtain at once a money value, while the flax could be shipped in bond and sold by an agent in the British markets. This could be equally

well performed by a private company, but in that case, the receipts would not be available to the farmers so readily as if they had the guarantee of the Government.

From the calculation of Mr. Bouchette as given above, there is no doubt that the export of hemp and flax (as both might be afforded the same advantage,) would soon reach $10,000,000 per annum, without materially decreasing the exports of wheat and flour. To promote the cultivation of these articles it has been suggested, that a model farm should be purchased by Government, where the capabilities of soil might be tested, and the best methods of cultivation made known. We are free to admit that such establishments have, as a general rule, proved utter failures, and their introduction here would be a very questionable policy. The publication of a simple essay on the culture and preparation of hemp and flax, and a reward offered for the best portable flax mill would probably do more to forward the objects in view than ten thousand pounds expended by a few costly *experimenters*, who might possibly think it a matter of vast importance that the simple farmers of our back townships should know the Latin and German names of the various products of the farm.

OILING HARNESS.

We find in the *New England Farmer* a valuable communication from Mr. J. Hart, of Portsmouth, N. H., in which he gives his method of cleansing, colouring, and oiling harness, which we think may be of use to our readers, so we publish it:—

We all know that it is a great benefit to oil our harness, yet many of us neglect to do it, because we regard it as a dirty job, but it is easy enough if done right. My process for doing it is as follows: 1st. I take the harness apart, having each strap and piece by itself, then I wash it in warm soap-suds. I used to soak it in cold water for half a day, as others did, but I found that warm water does not injure the harness and facilitates the job. When cleaned, I black every part with a harmless black dye, which I make thus: One ounce of logwood, twelve grains bichromate of potash both pounded fine; upon that I pour two quarts of boiling rain water, stirring until all is dissolved. When cool it may be used. I keep it on hand all the time in bottles. It may be applied with a shoe brush or anything else convenient. If any one objects to the use of this blacking, fearing that the bichromate of potash it contains would injure the leather, I would just say that this kind of potash will not injure leather, even when used in a much larger proportion. The blacking generally used contains copperas—a sulphate sometimes made of oil of vitrol and iron, and it will eat out the life of leather, unless used with great caution. When the dye has struck in, I go through with the oiling process; some have a sheet iron pan to oil in, which is better than any thing, but I have a sheet of iron nailed to a board, about two or three feet square. This I put on a table, and lay a piece or part of the harness upon it, and with neats-foot oil applied with a paint brush kept for the purpose, I go over it, oiling every part, and thus proceed until every part is oiled. The traces, breeching, and such parts as need oil most, I oil again. For the last oiling I use one-third castor oil and two-thirds neats-foot oil, mixed. A few hours after, or perhaps the next day, I wipe the harness over with a woollen cloth, which gives it a glossy appearance. Why I use castor oil for the last coat is, because it will stand the effect of the atmosphere, the rain, &c., much longer than neats foot oil, consequently the harness does not require oiling so often by its use. One pint of oil is sufficient for one set of harness.

The common way of oiling harness, is to apply as much neats-foot oil containing lampblack as the leather will take up, then washing off with castile soap and water. This way is not so good as mine, because it makes the harness smutty, and also, the soap that is used contains barilla, a strong alkali, which cuts up and feeds upon the oil in the leather, and weather, especially if rainy, soon renders the harness stiff and unyielding as before; the wax in the thread is also destroyed and the stitching gives way. I have experimented with different kinds of oil, and find that the kind and the process I now use is the best.

NIGHT-AIR.

During the months of September and October, throughout the United States, wherever there are chills, and fever and ague, intermittents, or the more deadly forms of fever, it is a pernicious, and even dangerous practice, to sleep with the outer doors and windows open; because miasm, marsh emanations, the product of decaying vegetation—all of which are different terms, expressing the same thing—is made so light by heat, that it ascends at once towards the upper portion of atmospheric space, and is not breathed during the heat of the day, but the cool nights of the Fall of the year condense it, make it heavy, and it settles on the ground, is breathed into the lungs, incorporated into the blood, and if in its concentrated form, as in certain localities near Rome, it causes sickness and death within a few hours. The plagues which devastated Eastern countries in earlier ages, were caused by the concentrated emanations from marshy localities, or districts of decaying vegetation; and the common observation of the higher class of people was, that those who occuped the upper stories, not even coming down stairs for market supplies, but drew them up by ropes attached to baskets, had entire immunity from disease, for two reasons, the higher the abode, the less compact is the deadly atmosphere, besides, the higher rooms in a house, in summer, are the warmer ones, and the miasm less concentrated. The lower rooms are colder, making the air more dense. So, by keeping all outer doors and windows closed, especially the lower ones, the building is less cool and comfortable, but it excludes the infectious air, while its warmth sends what enters through the crevices immediately to the ceilings of the rooms where it congregates, and is not breathed; hence is it that men who entered the bar-room and dining-saloons of the National Hotel, remaining but a few brief hours, were attacked with the National Hotel Disease, while ladies who occupied upper rooms, where constant fires were burning, escaped attack, although remaining in the house for weeks at a time. It was for the same reason that Dr. Rush was accustomed to advise families in the summer-time, not being able to leave the city, to cause their younger children especially, to spend their time above stairs. We have spent a lifetime ourselves in the West and extreme South, and know in our own person, and as to those who had firmness to follow our recommendation, that whole families will escape all the forms of Fall fevers who will have bright fires kindled at sunrise and sunset in the family room. But it is too plain a prescription to secure observance in more than one family in one thousand. After the third frost, and until the Fall of the next year, it is an important means of health for persons to sleep with an outer door or window partly open, having the bed in such a position as to be protected from a draught of air. We advise that no person should go to work or take exercise in the morning on an empty stomach; but if it is stimulated to action by a cup of coffee, or a crust of bread, or apple, or orange, exercise can be taken, not only with impunity, but to high advantage in all chill and fever localities.—*Hall's Journal of Health.*

INAUGURATION OF THE STATUE OF SIR ISAAC NEWTON, AT GRANTHAM.

To our great and immortal Newton, the philosopher, and the christian, another memento of a nation's grateful homage has just been paid, and Grantham, in Lincolnshire, the seat of Newton's early studies, stands proudly pre-eminent for being the site chosen for such tribute. The ceremony of inaugurating the statue recently took place, and a most interesting spectacle it was, a procession issuing from the Grammar school in which the philosopher received that instruction, and in which he himself fostered that talent which have since shed light on all the civilized world. The procession was headed by the Mayor and civic authorities, the Bishop of the Diocese, Lord Brougham, &c. As soon as the venerable nobleman had taken his seat, in the actual chair in which Sir Isaac Newton was wont to sit while composing his "Principia," the statue was denuded of its covering, and Lord Brougham, in an elaborate speech, gave evidence that neither his own mental powers were on the wane, nor was the enthusiasm with which he alluded to the unrivalled endowments of mind of the great philosopher, aught but that

which springs from a soul thoroughly impressed with the undisputed worth of the object of his eulogy. It is pleasing, after the lapse of nearly two centuries, to find so noble a testimony to the memory of him, whose researches and learning have done more to unfold the mysteries of the solar system than any other human being—whose perceptions of the laws of nature have cleared a path through which men of the present generation can wander with delight. The name of Sir Isaac Newton never could die; it is enrolled in the movement of every star, and is stamped on every calculation relating to art or science. A people's tribute to a deceased warrior or a departed statesman bespeaks a noble spirit; but there is a something indescribable in the pleasure with which one must view the proceedings at Grantham. There, neither warrior nor statesman was the theme of praise, but thousands of an after-generation met to do homage to the memory of the profound scholar and the humble christian. Nor was the circumstance less interesting from the fact of one of our deepest mathematicians of the present day—Henry Lord Brougham, standing there, in the 80th year of his age, paying tribute to the departed philosopher in a speech worthy of the finest orators whose names Greece and Rome have handed down to us. At that age, too, this man of varied attainments, who has devoted a whole life for the wide spreading of knowledge and for the advancement of science—now, (it is affirmed) filling up his leisure time by preparing a new edition of the "Principia"—all this added interest to a scene, in itself most gratifying; and Grantham must long remember with pride the day, when, on St. Peter's Hill, the statue of Newton was inaugurated by the greatest philosopher and statesman of the present day.—*English Paper.*

SEVEN REASONS FOR HAVING A SMALL HOUSE.

It is often remarked by strangers that Pennsylvanians build large barns to the discredit of their small houses, much of which is true, but I apprehend that it is not the want of size in their houses, so much as the want of comfort and convenience that should be animadverted upon. We confess to a liking for small houses and small women. Touching the former, we will here give seven good, and as we think, sufficient reasons for our preference. In the first place, they imply small, cozy rooms. Not cramped, but mensurable. So small that the light and heat are reflected and radiated from all parts. Family comfort cannot thrive in a hall or a field. I imagine that the boy who did not feel sufficiently acquainted with his father to ask him for a new cap, lived in "a palatial residence." I doubt not, for the same reason, people living among mountains are more sociable than those who live on plains. Affection, like a smile, dies unless it is reflected. *Secondly,* We like small houses because they look paid for, and a small house paid for holds more happiness and real friends than a large one unpaid. Anything unpaid is uncomfortable. To an honest man debts are demons, and an indebted house a haunted house full of creeping horrors and disquietudes as that described by Hood. *Thirdly,* We like small houses because they look sympathizing. They are like people not overdressed, more ready to make acquaintance. A big house is like a big man—unaccostable. Stately porticos and lordly halls are like the titles D. D., LL.D., &c.—imposing, distant, and inclined to be repellent. In the *fourth* place, we like a small house because it excites no envy. It matters not how elegantly it is furnished, how tastefully surrounded and adorned by shrubbery and flowers, its observers are its admirers and friends. It does not fall under the "evil eye," and no man who has a soul would wish even his house—his home—the abode of his wife and children, to be an object of envy. Every body can say, and is encouraged to say, "I can build such a house"—which words are equivalent to a blessing. *Fifthly,* We like a small house because it must always remain the people's house. The industrious mechanic can earn such a house. The diligent laborer can own, by patient industry, such a house. The widow can live in such a house, and what a rich, rational comfort it is to live in such accommodations as of necessity must be the dwelling-place of nine-tenths of the race. *Sixthly,* We like small houses, because in such most of us begin life. It is with small houses that the affections of young couples, the first cares and joys of married life, are mostly associated. Most of us begin "in a small way." In the last place, we prefer the small house, because it is not so far removed from our last narrow home. Only a few steps down and our weary feet are there, but from the large palace to the narrow grave the change is too abrupt. I've grown sober over these orders of architecture, and will stop.—*Farmer Boy in Ohio Farmer.*

QUALITY OF BEEF.

The Yankees generally seem to think that all beef is alike—varying only in regard to the age of the animal slaughtered, and characterised by the terms *tough or tender*.

John Bull understands the nature of beef better. He not only knows that there is a difference in the quality of beef in individuals of the same breed, and he has a faculty of discriminating by his thumb and finger, or by touch, but he also knows that the different breeds, supposing them to be fattened by the same material, are very different indeed in their qualities.

At the last international fat cattle show, in Paris, the judges on beef had specimens from each of the competing breeds brought to the table *roasted*, where they performed their agreeable labors in a very quiet and satisfactory manner. The result of their deliberations was as follows:—

First	quality	to the	West Highland Ox.
Second	"	"	Devon Ox.
Third	"	"	French Ox.
Fourth	"	"	Short Horn and Angus Ox.*
Fifth	"	"	Angus (Scotch) Ox.
Sixth	"	"	French Ox.
Seventh	"	"	Short Horn (English) Ox.
Eighth	"	"	French Ox.

So much for the roasted. For soups and boiled beef, they gave the preference to the Short Horn, (English.)

We have been urging the raising of Scotch (Galloway) cattle for beef, in preference to some of the larger breeds. The quality of the beef of this breed is superior—but our Yankee brethren laugh at them, thinking that it is the *pile* of beef which the animal makes, and not the *quality*, which should be the main object. We go in for quality and fair size, rather than quantity and poor quality.

HOW TO EXTERMINATE THE WEEVIL.

J. L. Booth, now of New York, who has made some valuable improvements in grain cleaning machinery for flour mills, sends us the results of some experiments with his machine for scouring grain. He obtained from a farmer thirty bushels of wheat from a bin of two hundred bushels, and after passing it through the machine, placing glass jar samples of the cleaned and uncleaned. Upon examination some time after, he found the latter alive with weevil and badly eaten, while that which had been scoured was perfectly free from any appearance of the insect. This led him to a microscopic examination of the berry of wheat, which resulted in convincing him that any grain infested with weevil can be entirely cured and preserved by the simple process of cleaning. In proof of which he states that a large portion of the grain seemed to have a single blister or slight prominence upon the germinating end of the berry, which was readily removed by the point of a knife, and the egg of the weevil discoverd. Mr. Booth is satisfied that this thorough scouring and agitation of the grain removes the glutenous covering of the cell containing the egg, and that its exposure to the air destroys its generating properties. And if the wheat is taken in any condition, after this insect has passed into the larva or perfect state, and treated as above mentioned with any effective smutter, this pest will be completely eradicated. There are other species of the same destroyer—one in which the egg is deposited in the berry while in a soft state before harvest, and the depository being capped over to exclude the air, the egg remains thus protected until the grain is again sown, and does not change until decomposition commences from the action of the earth and process of germination. Many ineffectual attempts to find a remedy have been made. As Mr. Booth's process is within the reach of all, it is worth the while of those whose grain is infested by the weevil to try it.—*N. Y. Evening Post.*

The above, of course refers to the insect which attacks wheat in the granary, scarcely, if at all, yet known in Canada.

* A Scotch cross.

BISCUIT FODDER.

This is the name given by M. Naudin, a veterinary surgeon of the Imperial Guard, to a preparation of his invention, which has already been successfully tried in some cavalry barracks, and would seem, besides other advantages, to solve the problem which at present engrosses the attention of the agricultural world, namely, a sufficient supply of fodder for cattle in times of scarcity occasioned by drought. This biscuit fodder is composed of all kinds of substances generally given to horses and cattle—such as straw, hay, clover, oats, barley, peas, etc. To these may be added many others, such as the refuse of the wine-press, the pulp of various roots, the stalks of millet and maize, the leaves of the vine, the beet-root, and of certain trees, the sweepings of the barn and hayloft, which contain a vast quantity of nutritious matter in the flowers and seeds of hay, etc., which are generally thrown away. All these ingredients are bruised and chopped together; a mucilage of barley flower is then added, with a little salt, and the mixture is then left to itself for a few hours until a slight fermentation has set in, when it is put into square moulds, made into cakes, and left to dry in a current of warm air. In this state it may be preserved for a great length of time. When it is to be used, it is moistened with about one-fifth of its weight of water; each cake is broken into seven or eight pieces, and put into the manger or nose-bag, as the case may be. The cakes should weigh about a pound each; twenty cakes of that weight are sufficient for the daily ration of a horse. The advantages which this preparation offers are evident; mastication and digestion are rendered easier, and therefore the general health of the animal is ensured. A sufficiency of fodder can be laid in store for the winter; the rearing of cattle need not be checked for want of food, and the waste occasioned by the animals themselves while they eat at the manger, letting half their allowance fall on the floor of the stable is obviated. The cab-horse, which eats its hay on the cab-stand, often soiled with mud and filth, will find in the biscuit fodder a clean and wholesome aliment; horses conveyed on railways, and especially on board ship, can be easily fed, the stowage of a sufficient quantity of these cakes for a long voyage taking up but little space, while all danger of fire and spontaneous combustion, of so frequent an occurrence in hayloft, is completely obviated. Lastly, these cakes may be used as convenient vehicles for any kind of drugs which it may be necessary to administer.

THE ANTHRACITE COAL TRADE.

Thirty-one years ago the first coal went to Philadelphia, being ten wagon loads, hauled over the mountains by George Shoemaker, of Pottsville. Very few persons could be induced to purchase it, and most of these were wholly unsuccessful in their attempt to make it burn. Everybody considered it a mere stone. Mr. Shoemaker was denounced in all quarters as a cheat, and measures were being taken to arrest him for swindling, but he escaped arrest by leaving the city by a circuitous road, and did not stop until he had got thirty miles on his homeward journey. The most remarkable feature in this extraordinary speculation was, that Mr. Shoemaker did not himself know how to make the coal burn. He was therefore unable to convince the public that it really would ignite. Had he experimented at home, and brought with him a grate or stove in which to kindle a successful fire, the exhibition would have, no doubt, hastened full ten years the development of the coal business. He reached home disgusted at the belligerent temper of the citizens, and heart sick at the ill success of his adventure. His reputation as an honest man was rescued, however, by an iron master in Delaware county, into whose hands some of the repudiated mineral accidentally fell. He tried the coal, caused it to burn freely with an intense heat, and was so pleased with it that he proclaimed the fact in the newspapers. This led others to try, and they also succeeded. The prejudice was removed, and consumption went on from this disastrous beginning, until it at last reached the enormous quantity of 3,479,862 tons. But up to this date the depression of manufacturing has caused a reduction of 300,000 tons to be sent to market, and the whole year undoubtedly shows a falling off full 600,000 tons.—*Miner's Journal.*