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THE

CANADIAN AGRICULTURAL JOURNAL.

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Now that the new law with regard to Agricultural Societies is about to come into operation, we trust that every exertion will be made, that the public money granted to these Societies, shall be applied in such a way as will be likely to produce improvement where most required. The county of Montreal should set the example in this respect, being the most generally cultivated, and having an excellent soil.—When we acted as Secretary to the County Society, we proposed that a certain number of premiums should be offered in each parish in the County (of which there are nine) for well managed farms, suitable buildings, sowing grass-seed, summer fallowing, &c. &c. By this means the action of Agricultural Societies would be brought to the door of every farmer, who now does not, perhaps, know that such Societies are in existence. It would also have the effect of encouraging example farms in every parish, and amongst farmers where improvement is most required, which should be the chief aim of Agricultural Societies. To instruct the ignorant, and show them at their doors the results of improved systems of husbandry, is the true mode of ensuring the benefit that may be derived from the agricultural laws, to the country generally. The County of Montreal offers the most encouraging opportunity to put this plan in full operation. In all the parishes there is sufficient wealth and intelligence to commit the management of a due proportion of the funds granted to the Society, for distribution in the several parishes. Let the Society adopt what rules and regulations they may think fit for the distribution of the money in the parishes, but in justice to the parishes, let them have the funds that may reasonably belong to them in proportion to population. We would even suggest, that in case the parishes do not feel sufficiently interested in the matter to take an active part immediately, that the Society should depute some of their members to visit the parishes, and in consert with the Roman Catholic and other Clergy, endeavour to explain the object in view and organize the people. It will be of no effect whatever to the general improvement of agriculture in Lower Canada, that Agricultural Societies should be organized, if their operation is confined to the immediate neighbourhood of our chief cities, and villages, and the premiums paid amongst old country farmers for superior animals, and to men who will tell you plainly they cannot receive any benefit from anything which can be published on agricultural improvement, knowing it so perfectly already.

These observations only refer to Eastern Canada, and that portion of it where the vast majority of the rural population are of French origin. If an improved system of agriculture is desirable to be encouraged amongst them, we take upon us to say, that if Agricultural Societies are to be the instruments in producing this general good, they will have to act very differently from what has been their mode of acting hitherto. If the public money is granted only for rewarding those who are already good farmers, and who are so because they have experience of its advantages, and not for the instruction, and encouragement of those who are ignorant of the art of agriculture, we have nothing further to offer, except to say that the law of the last session will be as unproductive of general improvement where most required, as all our former laws have proved to be. Let the acting Committees of the Societies forego all personal pecuniary advantages from it, and let them, as they have taken the duties upon them, sacrifice a part of their time, and give a part of their knowledge of agriculture, to instruct and encourage their brother farmers who have been less fortunate. They can, if so disposed, retire from the conduct of the Society at the period fixed by the law, and allow others to take the duties upon them in their turn. Thus many would have an opportunity of exercising their talents, and judg-

ment for the good of their country, who, if constantly shut out from any opportunity of doing so, are discouraged and disgusted, and their usefulness lost to their countrymen. If individuals are not disposed, or do not find it convenient to give much of their time or talents to the public, they may at least allow others to do so. We are aware that it may not be convenient to many to give much of their time to the public, but it would not require to give so much as would be injurious to do what we propose to the Committees of Agricultural Societies. All we desire is, that the late law may prove as beneficial to the country as its framers, no doubt, expected it to be. All depends, however, on the conduct of those who have the management of the funds committed to their disposal, and they will, undoubtedly, be answerable, or rather be chargeable for the consequences of the failure of the operation of the Agricultural Bill, should it not be productive of general improvement, which it is possible for it to produce, if judiciously put in operation. It is not by making rules for the parishes and publishing them on paper that will have effect, unless efforts are made to put their rules in practice, otherwise they may not be even heard of by the farmers for whose benefit they are intended. We beg to offer, to the disposal of the County of Montreal Agricultural Society, without any charge, twenty-five copies of our Agricultural Journal, to be distributed by them to farmers in the country who do not take any other agricultural paper. We should give double the number in the French language, but do not publish in French this year, though we expect to see it in that language in the next year. We make this contribution to the Society, that farmers who do not receive an agricultural paper may have one without any charge.

DIRECTIONS FOR THE PROPER MANAGEMENT OF THE FLAX CROP.

The following directions have been carefully arranged from the mass of information obtained by the "Society for the Promotion and Improvement of the Growth of Flax in Ireland," and their agriculturists, during their four years' experience in the improved system of management. By this system Irish flax has been produced, which brought, in some cases, the high prices of £90 to £140 per ton :—

SOIL AND ROTATION.

By attention and careful cultivation, good flax may be grown on various soils ; but some are much better adapted for it than others. The best is a sound, dry, deep loam, with a clay subsoil. It is very desirable that the land should be properly drained, and subsoiled ; as, when it is saturated with either underground or surface water, good flax cannot be expected.

Without method, there cannot be success,—different soils require a difference of rotation. In the best soils of Flanders, flax is grown in the third year of a seven-course rotation, or the fifth year of a ten-course rotation.

It is not considered generally advisable to grow flax more frequently than once in the ten years.* In Belgium, it invariably follows a corn crop,—generally oats ; and, in this country, where oats is such a principal crop, the same system might be profitably pursued ; but it must be understood, that it is only after oats following a green crop or old lea, and never after two or three succeeding crops of oats, which bad practice still prevails in some districts. It is a very general error, among farmers, to consider it necessary, that flax should follow a potatoe crop. Except on very poor soils, a better crop will be produced after grain, and the double benefit of the grain and flax secured. If old lea be broken up, and potatoes planted, a very fine crop of flax may be obtained in the following year.

PREPARATION OF THE SOIL.

One of the points of the greatest importance in the culture of flax, is, by thorough-draining, and by careful and repeated cleansing of the land from weeds, to render it of the finest, deepest, and cleanest nature. This will make room for the roots to penetrate, which they will often do, to a depth equal to one-half of the length of the stem above ground.

After wheat, one ploughing may be sufficient on light friable loam, but two are better ; and, on stiff soils, three are advisable,—one in Autumn and two in Spring, so as to be ready for sowing in the first or second week of April. Much will, of course, depend on the nature of the soil, and the knowledge and experience of the farmer. The land should be so drained and subsoiled, that it can be sown in flats, which will give more evenly, and much better crops. But, until the system of thorough draining be general, it will be necessary, after oats, to plough early in Autumn. Throw the land into ridges, that it may receive the frost and air; and make surface drains to carry off the rains of Winter. Plough and harrow very early in Spring ; and again a month after, to bring the land into good tilth, and

* The following rotation, which would bring flax once in ten years, has been proposed :—*First year, potatoes* ; second, barley, laid down with grasses ; third year, cut for soiling ; fourth year, pasture ; fifth year, flax ; or the one-half might be better in flax, the other in oats, so that, with the return of the rotation, which would be in five years, the flax could be put on the ground which, in the last rotatory course, was under corn, throwing a range of ten years between the flax crops coming into the same ground.

A gentleman of much practical knowledge recommends the following as being the most profitable :—1. *Oats after* grass and clover. 2. Flax pulled in August ; then ploughed and harrow in, two cwt. guano and two cwt. gypsum ; then sown with rape. 3. Potatoes or turnips, well manured. 4. Wheat, and sown in Spring, with clover and rye-grass. 5. Hay and clover. 6. Grazing. 7. Oats. 8. Flax and Winter vetches ; guano, as before-mentioned. 9. Turnips, well manured. 10. Barley, sown with rye-grass and clover. 11. Clover and hay. 12. Grazing. 13. Oats.

clean it thoroughly from weeds and roots. Following the last harrowing, it is necessary to roll, to give an even surface, and consolidate the land, breaking this up again with a short-toothed, or seed harrow, ere sowing.

SOWING.

The seed best adapted for the generality of soils is Riga, although Dutch has been used in many dist icts of country, for a series of years, with perfect success. American seed does not generally suit well, as it is apt to produce a coarse, branchy stem. If used, it should only be on deep loamy soils. Select plump, shining, heavy seed, of the best brands, from a respectable merchant. Sift it clear of all the seeds of weeds, which will save a great deal of after trouble, when the crop is growing. This may be done by fanners, and through a wire sieve, twelve bars to the inch. Home-saved seed, grown from foreign, has been used, in many cases, with success. It is suggested that a small portion of the crop may be allowed to stand, until the seed be fully ripe, and then pulled, and the seed preserved for sowing; but the seed saved from *it*, in the following year, should only be used for feeding, or sold for the oil-mills. The proportion of seed may be stated at three-and-a-half Imperial bushels to the Irish or Plantation acre; and so on in proportion to the Scotch or Cunningham, and the English or Statute measure. It is better to sow too thick than too thin; as, with thick sowing, the stem grows tall and straight, with only one or two seed capsules at the top, and the fibre is found greatly superior in fineness and length, to that produced from thin sown flax, which grows coarse, and branches out, producing much seed, but a very inferior quality of fibre. The ground being pulverized and well cleaned, roll and sow. After sowing, cover it with a seed harrow, going twice over it,—once up and down, and once across or anglewise; as this makes it more easily spread, and avoids the small drills made by the teeth of the harrow. Finish with the roller, which will leave the seed covered about an inch, the proper depth. The ridges should be very little raised in the centre, when the ground is ready for the seed, otherwise the crop will not ripen evenly; and when land is properly drained, there should be no ridges. The sowing of clover and grass-seeds along with the flax is not advised, when it can be conveniently avoided, as these plants always injure the root ends of the flax. But carrots may be sown on suitable soils, in drills, so that the person pulling the flax may step over the rows, which may be afterwards hoed and cleaned, and should have some liquid manure. A stolen crop of rape or Winter vetches may be taken after the flax. Rolling the ground, after sowing, is very advisable, care being taken not to roll, when the ground is so wet, that the earth adheres to the roller.

WEEDING.

If care has been paid to cleaning the seed and the soil, few weeds will appear; but if there be any, they must be carefully pulled. It is done, in Belgium, by women and children, who, with coarse cloths round their knees, creep along on all-fours; this injures the young plant less than walking over it (which, if done, should be by persons whose shoes are not filled with nails;) they should work, also, facing the wind, so that the plants, laid flat by the pressure, may be blown up again, or thus be assisted to regain their upright position. The tender plant, pressed one way, soon recovers; but, if twisted or flattened by careless weeders, it seldom rises again.

PULLING.

The time when flax should be pulled is a point of much nicety to determine. The fibre is in the best state, before the seed is quite ripe. If pulled too soon, although the fibre is fine, the great waste in scutching and hackling renders it unprofitable; and, if pulled too late, the additional yield does not compensate for the coarseness of the fibre. It may be stated, that the best time for pulling is, when the seeds are beginning to change from a green to pale brown colour, and the stalks to become yellow, for about two-thirds of its height from the ground. When any of the crop is lying, and suffering from wet, it should be pulled as soon as possible, and kept by itself. So long as the ground is undrained, and imperfectly levelled before sowing, the flax will be found of different lengths. In such case, pull each length separately, and steep in separate pools, or keep it separate, in the same pool. If the ground has been thorough-drained, and laid out evenly, the flax will be all of the same length. It is most essential to take time and care to keep the flax *even, like a brush*, at the root ends. This increases the value to the spinner, and, of course, to the grower, who will be amply repaid, by an additional price for his extra trouble. Let the handfulls of pulled flax be laid across each other, diagonal y, to be ready for the

RIPPLING,

Which should be carried on at the same time, and in the same field, with the pulling. If the only advantage to be derived from rippling was the comparative ease with which rippled flax is handled, the practice ought always to be adopted. But, besides this, the seed is a most valuable part of the crop, being worth, if sold for the oil-mills £3 per acre; and, if used for feeding stock, of all kinds, at least £4 per acre. The apparatus is very simple. The ripple consists of a row of iron teeth screwed into a block of wood. This can be procured in Belfast, or may be made by any handy blacksmith.* It is to be taken to the field, where the flax is being pulled, and screwed down to the centre of a nine-feet plank, resting on two stools. The ripplers may either stand, or sit astride at opposite ends. They should be at such a distance from the comb, as to permit of their striking it properly and alternately. A winnowing sheet must be placed under them, to receive the bolls as they are rippled off; and then they are ready to receive the flax just pulled,—the handfuls being placed diagonally, and bound up in a sheaf. The sheaf is laid down at the right hand of the rippler, and untied. He takes a handful with one hand, about six inches from the root, and a little nearer the top, with the other. He spreads the top of the handfull like a fan, draws the one-half of it through the comb, and the other half past the side; and, by a half turn of the wrist, the same operation is repeated with the rest of the bunch. Thus the flax can be rippled without being passed more than once through the comb. He then lays the handfuls down at his left side, *each handfull* crossing the other, when the sheaf should be carefully tied up and removed. The object of crossing the handfulls so carefully, after rippling, when tying up the beets for the steep, is, that they will part freely from each other, when they are taken to spread out

*The best ripples are made of ½-inch square rods of iron placed with the angles of iron next the ripples, 3.16ths of an inch asunder at the bottom, ½-inch at the top, and 18 inches long, to allow a sufficient spring, and save much breaking of flax.

on the grass, and not interlock, and be put out of their even order, as would otherwise be the case. If the weather be dry, the bolls should be kept in the field, spread on winnow cloths, or other contrivance for drying; and, if turned from time to time, they will win. Passing the bolls first through a coarse riddle, and afterwards through fanners, to remove straws and leaves, will facilitate the drying. If the weather is moist, they should be taken in-doors, and spread out thinly and evenly on a barn floor, or in a loft, leaving windows and doors open, to allow a thorough current of air; and turned twice a-day. When *nearly dry*, they may be taken to a corn kiln (taking care not to raise it above Summer heat,) and carefully turned, until no moisture remains. By the above plan of *slow* drying, the seed has time to imbibe all the juices that remain in the husk, and become perfectly ripe. If it be taken at once from the field, and dried *hurriedly* on the kiln, these juices will be burned up, and the seed will become shrivelled and parched, little nutritious matter remaining. In fine seasons, the bolls should always be dried in the open air, the seed threshed out, and the heaviest and plumpest used for sowing or crushing. The light seeds and chaff form most wholesome and nutritious feeding for cattle. Flax ought not to be allowed to stand in the field if possible, even the second day; it should be rippled as soon as pulled, and carried to the water, as soon as possible, that it may not harden.

WATERING.

This process requires the greatest care and attention. River water is the best. If spring water has to be used, let the pond be filled some weeks, or months, if possible, before the flax is put in, that the sun and air may soften the water. That containing iron, or other mineral substances, should never be used. If river water can be had, it need not be let into the pond sooner than the day before the flax is to be steeped. Place the flax in the pool in one layer somewhat sloped, and in regular rows, with the root end uppermost. Cover with moss sods, or tough old lea sods, laid perfectly close, the sheer of each fitted to the other. Before putting on the sods a layer of rushes or ragweeds is recommended to place on the flax, especially in new ponds. Thus covered, it never sinks to the bottom, nor is it affected by air or light. A small stream of water allowed to run through a pool has been found to improve its colour. It will be sufficiently steeped in an average time, from eight to fourteen days, according to the heat of the weather, and the nature of the water. Every grower should learn to know when the flax has had enough of the water, as a few hours too much may injure it. It is, however, much more frequently *under* watered than *over* watered. The best test is the following:—Try some stalks of average thickness, by breaking the *shove* or woody part, in two places, about six or eight inches apart, at the middle of the stalk; catch the broken bit of wood, and if it *will pull freely out, downwards, for that length, without breaking or tearing the fibre, and with none of the fibre adhering to it*, it is ready to take out. Make this trial every six hours, after fermentation subsides, for sometimes the change is rapid. Never lift the flax roughly from the pool, with forks or grapes, but have it carefully handed out on the bank, by men standing in the water. Spread on the same day it is taken out, unless it be raining heavy; light rain does little harm. If it cannot be spread, let it be set on end, or separated into small parcels, to prevent it heating in the heap. It is advantageous to let the flax drain for a few hours, after being taken from the pool, by placing the bundles on their ends, close together, or on the flat, with a slope.

SPREADING.

Select, when possible, clean, short, thick pasture ground for this operation; and mow down and remove, any weeds that rise above the surface of the sward. Lay the flax evenly on the grass, and spread thin, and very equally. If the directions, under the head of rippling have been attended to, the handfuls will come readily assunder, without entangling. Turn it two or three times, while on the grass (with a rod about eight feet in length, and an inch and a half in diameter), that it may not become of different shades, by the unequal action of the sun, which is often the case, through inattention to this point. Turn it when there is a prospect of rain, that the flax may be beaten down a little, and thus prevented from being blown away.

LIFTING.

A good test of its being ready to lift is, to rub a few stalks from the top to the bottom; and, when the wood breaks easily, and separates from the fibre, leaving it sound, it has had enough of the grass. Also, when one stalk in fifty is perceived to form *a bow and string*, from the fibre contracting and separating from the woody stalk. But, the most certain way is, to prove a small quantity with the handbreak, or in a flax mill. In lifting, keep the lengths straight, and the ends even, otherwise great loss will occur in the rolling and scutching. Tie it up in small bundles; and if not taken soon to be scutched, it will be much improved by being put up in small stacks, loosely built, with stones or brambles in the bottom, to keep it dry, and allow a free circulation of air. Stacks built on pillars would be the best.

DRYING,

By fire, is *always most pernicious*. If properly steeped and grassed no such drying is necessary; but, to make it ready for breaking and scutching, exposure to the sun is sufficient. In some districts it is put to dry *on kilns*, in a damp state, and is absolutely burnt before it is dry, and the rich oily property of the flax is always greatly impaired. On this point the Society can scarcely speak too strongly, as the flax is either destroyed, or rendered not worth one-half of what it would be, if properly dried.

BREAKING AND SCUTCHING,

If done by hand, should be on the Belgian system, which is less wasteful than that practised in Ireland. If by milling, the farmer will do well to select those mills in which the improved machinery has been introduced. The Society would also recommend, that the farmer should endeavour to have his flax scutched by a mill-owner who pays his men *by the day, and not by the stone, even if it should* cost him higher in proportion—the system of paying the scutchers by the stone, rendering them more anxious to do a large quantity in the day, than to produce a good yield from the straw.

THE COURTRAI SYSTEM.

This is the universal mode in the district from which the finest flax we receive is brought. As soon as pulled, the flax is stooked, without binding it. The handfulls are set up, resting against each other, the root ends spread out, and the top ends joining like the letter A, forming stooks about eight feet long, and a short trap keeping the ends firm.

In this way it will resist wind and rain well, and dry fast. In six or eight days it may be stacked in the field; the seed to be taken off, at leisure, in Winter; the flax to be steeped the following May—a system which possesses the advantages of affording the farmer the best season of the year for steeping and grassing, and a time of comparative leisure, when his attention is not called off to the harvesting of other important crops. It has in many cases, when tried in this country, proved highly successful; although, in others, it has failed, from want of experience, perhaps, in watering and grassing it. The treatment, in this way, has made the flax, in some cases, worth two or three shillings per stone more than part of the same crop, steeped green. It is recommended that trials of this system should be made, in the first instance, on a small scale.

MODE OF USING FLAXSEED FOR FEEDING CATTLE, &c.

The seed, given by itself, is too strong and oily to be very wholesome food; and, besides this, the mucilaginous matter prevents the seed from being bruised by the animal's teeth, or dissolved by the gastric juice. It is much better to take the bolls to a mill, where there are edge-stones, without thrashing out the seed, and to have them ground under the stones, set very close, or have the seed cracked in an oat-bruiser; or, the small farmer, when no other means are within his reach, may use a metal pot, bedded in clay, and pound the bolls in it, with a hard wood pestle, made to fill the bottom of the pot. About a dozen of strokes are sufficient to make the bolls into a fine meal. The chaff and seed, mixed together, afford most excellent nourishing food. It may be given, steamed or boiled; but it is best to steep the mixture from twelve to twenty-four hours in cold water, and then mix it up with lukewarm water, to the consistence of gruel. It will have formed a rich finely-dissolved jelly, easily digested, and of the most wholesome and nutritive quality, excellent to be given cows for producing plenty of milk and butter, for horses, for young cattle, or for pigs; a pint of linseed, and half a bushel of the chaff may be given at a feed.* A farmer who has once experienced the advantages of saving the seed bolls of his flax crop, will never neglect it again, as they can be turned to much advantage in any way or other.

TO AVOID EXHAUSTING THE LAND BY GROWING FLAX.

It has always been urged against flax culture, that it exhausted the soil; but this is not necessarily the case. If the seed be saved, and cattle fed upon the bolls, a valuable addition will be made to the manure heap, as, perhaps, the richest manure is produced by this kind of food. The putrescent water from the flax pools should be carefully preserved, and either used as a top-dressing for grass, or mixed with the weeds, and other refuse of the crop, in a heap to ferment. By these means, almost all the matter abstracted from the soil by the flax crop, would be returned in the shape of manure—the fibre being supplied by the atmosphere alone.

BIRDS AND ANIMALS "THE FARMERS FRIENDS."

As birds and animals are the farmer's best friends, I shall always advocate their cause; and to establish their claims I shall quote various good authorities, who have borne testimony of their utility, in addition to those which have been already given. Amongst the birds, that which stands first and foremost in the ranks is the rook. Wary as he is on most occasions, he follows the plough fearlessly, to feed upon the wireworms and other insects; and here his services are most invaluable, for if you dig up the wireworms and lay them upon the earth, they will often burrow down and disappear in a few seconds. Many, therefore, of the feathered race have little chance of catching them in the ploughed field; but the form of the bill, combined with the strength and assiduity of the rook, is well adapted for detecting them in the hiding-places. To pick them from the growing crops is likewise the occupation of the rook when we see him gravely surveying a turnip or corn crop, and with astonishing sagacity selecting those plants only which have a few yellow leaves outside, the sure indication of the presence of the wireworm and other insects. A gentleman in Norfolk, who well understands this subject, says, "The rooks convey the first tidings of the presence of this formidable enemy by hovering over a field in flocks, and actually pulling up the turnips by the roots to search for them; and I cannot but believe that their sagacity directs them to the infested plants, which are distinguished by their drooping leaves, and dark, unhealthy aspect." An equally observant friend, in Surrey, says, "The rooks are accused of doing injury by pulling up the wheat; but I, as well as others here, believe that they pull up but the attacked plants to get the wireworms, and do not touch the healthy plants." The bailiff to the same party informed me during a period when the wireworms were abundant that the rooks had been busily occupied amongst the barley in May, and where it looked sickly had drawn the earth away from the roots to find the wireworms, and where they had been "working the earth" he could not find any of the worms. But there is still stronger and incontrovertible evidence in their favour; for in the stomachs of rooks which have been shot when following the plough in barley-sowing, a few grains of corn only were found, but abundance of wireworms and other insects. Mr. J. Denson, senior, says, "I have repeatedly examined the crops of rooks. In six young that had been shot the crops were nearly filled with wireworms; in the crops of others I have found the larvæ of the cokchafer, and other grubs that I am not entomologist enough to know the name of. In one or two instances, in frosty weather, I have examined the crop of one or more rooks that had been shot; it contained dung, earth, and a small portion of grain. I will just notice that the land adjoining Mr. Wiles' rookery is yearly sown with pulse or grain, and in no instance have I known or heard that the land has in consequence failed of a crop." The following remarks also, by Mr. T. G. Clitheroe, are exceedingly interesting:—"In the neighbourhood of my native place, in the county of York, is a rookery belonging to W. Vavasour, Esq., of Weston, in Wharfdale, in which it is estimated that there are 10,000 rooks; that 1 lb of food a week is a very moderate allowance for each bird; and that nine tenths of their fo consist of worms, insects, and their larvæ for, althou they do considerable damage to the fields for a few weeks in seed-time and a few weeks in harvest, particularly in backward seasons, yet a very large proportion of their food, even at these seasons, consist of insects and worms, which (if we except a few acorns and walnuts in autumn) compose at all other times the whole of their subsistence. Here, then, if my data be correct, there is the enormous quantity of 468,000lbs., or 209 tons of worms, insects, and their larvæ, destroyed by the rooks of a single rookery in one year. To every one who knows how very destructive to vegetation are the larvæ of the tribes of insects, as well as worms, fed upon by rooks, some slight idea may be formed of the devastation which rooks are the means of preventing." Wagtails and robins are also very fond of the wireworm; and, probably, sparrows. Blackbirds and thrushes are constantly hunting the grass for them and other larvæ and pupæ. Pheasants and partridges are likewise exceedingly beneficial in this respect, and in some measure com-

* Four quarts of unbruised bolls contain, on an average, a pint of pure seed.

pensate farmers for the loss of the rook, crow, &c. When we find the game in the turnip-fields, they are usefully employed in picking out the wireworms, and the crops of the pheasant are frequently found full of them. I was not aware that the plover or lapwing, called also "pewit," lived very much upon wireworms, until a friend in Norfolk informed me of the fact. In the marshy districts of our eastern counties this bird was formerly exceedingly abundant, as well as the ruff and roe; but the gun and the nest-hunter have so thinned their numbers, that the lapwing is becoming scarce, and the latter have almost abandoned our shores; and, as might be expected, the wireworms seem to be increasing rapidly in such localities. On opening the lapwings that have been shot, their crops were found full of wireworms; and as it is supposed that one bird would eat a hundred in a day, the flocks of 40, 50, and upwards, that were constantly to be seen some years since, would clear off a very large number in a season. Their assistance, however, is departed and gone for ever; for the high price which the eggs fetch in the market causes the peasantry to look so carefully after the nests, that the only chance the lapwing has of escaping destruction is to seek the wildest districts of Scotland and Ireland, where their eggs not being so essential a luxury as they are considered in England, they may escape the persecution they have so long endured. Whether the destruction, of late years, of whole fields of corn as Oxborough, near Stoke, in Norfolk, is attributable to the absence of these birds, I cannot say; but it is certain that formerly the plover abounded in that neighbourhood, and now scarcely a pair can be seen. Before leaving the birds, it may be worth reminding the farmer that in Norfolk much benefit is derived from turning ducks into fields at the time of ploughing, when they pick up the wireworms, the larvæ of the cockchafer, &c., and whatever slugs there may be; and with regard to the wireworm, we think that turkeys and barn-door fowls would prove equally, if not more serviceable.—*Curtis' Observations on Natral History, Insects, &c.*

Farmers should be careful to order guano from well known respectable parties, really dealing in the article. Guano is being manufactured in immense quantities in Liverpool. They take sand from broken ground, mixing it with tanners' waste, sulphate of ammonia, and a brown substance; and this rubbish, costing a mere trifle, they sell to careless country people at £4 to £5 per ton, while the genuine is worth between £7 and £8.—*Hampshire Chronicle.*

CHEMISTRY FOR FARMERS.

BY JOHN SPROULE.

Author of a "Treatise on Agriculture," and of Prize Essays on "Flax," "Manures," &c.

(*Continued from page* 86.)

II. GENERAL PROPERTIES AND ARRANGEMENT OF MATTER.

It is not necessary further to enter into the application of chemistry to agriculture, or the numerous other arts of civilized life. As its especial object is the illustration of the properties of matter, there are few branches of art to which it is not capable of extending its aid. It explains the mutual combinations of the elementary or simple substances of which all matter is composed, and inquires into the laws which affect and the powers which preside over their union. It examines the proportions in which they combine, and the modes of separating them when combined; and, further, it endeavours to apply such knowledge to the explanation of the natural phenomena which every where surround us. It may also be observed, that as an *art* chemistry has made very considerable progress. The methods of separating the constituents of bodies from each other, and of determining their properties, have been investigated with very great success; but as a *science* it is still in its infancy, very little being known of the laws which regulate the combinations and separations of simple substances.

The numerous forms of matter with which we are surrounded, in whatever state they exist—whether forming the solid matter of the globe, which we inhabit, forming our own bodies or those of the numerous animal and vegetable forms in existence, the air which we breathe, or the waters which cover such a considerable portion of the earth—are conveniently divided into two great groups or classes of organic and inorganic matters. This classification is founded on laws apparent to every one. Under the term *organic* matter are included all such substances as either form or have formed part of a living structure, whether animal or vegetable, and, being composed of vessels or organs, are said to be organized, and hence the origin of the term by which this class of substances is distinguished. Many organic substances, it must however be observed, do not show any visible signs of their organization as denoted by the presence of organs, such as starch, sugar, and many other animal and vegetable compounds; but this is owing to certain mechanical or chemical changes which they have been made to undergo subsequent to their separation from the structure of which they originally formed a part. Being produced in the first place by the agency of living organs, the term organic is afterwards properly applied, whatever may be the form which they are afterwards made to assume.

There is in general little difficulty in distinguishing these classes of substances from each other. Organic matters, of whatever kind, are all easily decomposed or destroyed by a moderately high temperature—a characteristic of itself usually sufficient to distinguish them from the dead or *inorganic* matters of the globe. If wood or straw be heated in air, it speedily becomes charred, burns, and is soon in a great measure dissipated or destroyed. So sugar, starch, gum, or flesh, treated in like manner, darken in colour, and, by a continuance of heat, at last take fire, and are consumed. The same holds good of all animal and vegetable substances. The bones of animals seem an exception to this law, preserving their form even when subjected to a very high temperature; but it is to be observed that the solid part of bones is composed of inorganic matters, and it is these which resist the action of fire, the organic part being soon dissipated and driven off. Most organic substances after combustion leave a small residuum or ash behind; but this is also of inorganic origin. Sugar, starch, and gum leave no such ash behind, and in them, accordingly, no inorganic remains are found to exist.

Another distinguishing property of organic substances is, that artificial means are necessary for their preservation when deprived of the influence of the vital principle. All animal and vegetable forms, acted on by natural causes, are rapidly subjected to decomposition and decay; and, therefore, it is only by artificial means that they can be preserved. The conditions under which this decomposition actively takes place are exposure to the atmosphere, and subjection to the action of moisture and to a certain degree of heat; and any of these being withdrawn the power of decomposition is at once retarded. By the agency of this process such substances eventually altogether disappear. Inorganic substances are not, however, subject to its influence. The hardest rock may and indeed do crumble into powder, and their particles become washed away by rains; but they never putrefy or wholly disappear, existing then merely in a more minute state of division.

Organic are further distinguished from inorganic matters in the important particular that they cannot be formed by art. Many of the inorganic compounds existing in nature are formed with facility in the laboratory of the chemist, by the combination merely of the elements of which they are found, by analysis to consist. They may, when thus formed, exist in a different state of division; but still they will be identical in composition, and possessed of similar properties in every other respect. But in regard to organic substances, whether of animal or vegetable origin, the chemist is perfectly unable to form the most simple substance by any combination of its elements; being not less at fault with those apparently simple substances in which all visible trace of organization is lost, than with the most highly organized forms in nature. Analysis easily indicates the elementary substances forming woody or muscular fibre, sugar or starch, with the precise

proportions in which each exists; but by no means yet discovered can these substances again be formed by a combination of the elements of which they are composed. Science, indeed, possesses a certain degree of power to transform one of these substances into another.—By a simple process starch can be transformed into sugar, and the same holds good with some other substances; but this is different from forming either starch or sugar by a junction of their component elements.

In considering the properties of matter, an important characteristic to bear in mind as applicable to it, in whatever form it may exist, is its absolute indestructibility, no power within the reach of man being able to destroy a single particle. Water may be boiled until it wholly disappears; organic substances, as already stated, may be dissipated, so that nothing, or, at most, only a small quantity of ash, shall remain; by fermentation, the quality and characters of such matters may further be so greatly changed as not in any sensible degree to resemble the original substances whence they were produced, being perhaps not less changed in appearance than diminished in quantity; but in all these cases it is necessary to observe that it is the form only of the respective substances which has been destroyed: the particles composing them have entered into new combinations, but not a single particle has been annihilated or lost. In the fermentation of manures the quantity is found gradually to diminish until the process is completed; but by attentive observation it will be perceived that, while this decrease in bulk is taking place, certain gaseous matters are evolved and dissipated in the atmosphere, the quantity of which exactly corresponds with the subsidence in the heap by which its abstraction is accompanied. In the burning of coal, the black matter which disappears unites with one of the ingredients of the atmosphere, and becomes a clear transparent, and colourless gas; but by certain chemical operations it can be shown that the gas contains those particles which were solid and black in the coal—in fact, that in this gaseous state they merely exist in a different form. In like manner, coal gas, from which such a brilliant light is obtained, contains in the colourless and invisible state a number of the particles which were solid and black in the coal, and these can be recovered from the gas by similar processes. This apparent loss or destruction of matter arises from the particles assuming a form in which they cannot be detected by the eye, and flying away at the same time from the spot in which the change was affected. Dried organic matters are solid, coloured, and opaque; but in burning, they disappear by becoming aerial, transparent, and colourless, mixing as an invisible gas with the surrounding air. It is, however, a fallacy to suppose that in consequence of such changes a single atom is ever annihilated or lost. A large proportion of the matters by which we are surrounded is constantly in a state of change, undergoing new forms, and entering into new states of combination necessary for the maintenance of animal and vegetable life. Not a motion of our own bodies can take place without such changes being effected. In the process of respiration one of the ingredients of the atmosphere is disengaged from the other, and enters into combination with an ingredient previously existing in the system, but then to be given off, the compound thus formed (carbonic acid gas,) being exhaled. These are curious and interesting phenomena, the investigation of which shall occupy our attention in a subsequent part of these papers.

The term *simple* or *elementary* substance, as distinguished from *compound* substances, has been used; and it is necessary, before proceeding further, that its signification should be explained. The distinction of *organic* and *inorganic* is in fact not more important that that of *simple* and *compound*, as applied to every variety of existing matter. Though the numerous bodies existing in nature are exceedingly diversified in their forms and properties, they are all resolvable into a comparatively small number of elementary ingredients. Under the term *elementary* or *simple* substance, we include all those bodies which have hitherto resisted decomposition or resolution into simple forms of matter: thus the well-known metal lead is considered to be an element, being, so far as we know, a simple substance. We cannot extract from it any substance different from itself. We cannot transform it into any matter different from lead, except by adding some different kind of matter to it. Red lead, the well-known pigment so extensively used in the arts, is, however, a compound substance, consisting of two simple bodies, each when separated very different from itself. These are lead and oxygen, either of which can be extracted from the pigment; and it can, in fact, again be formed by the combination of these elementary ingredients. In the same manner, iron is a simple substance; but the rust formed on iron, when acted on by a damp atmosphere, is a compound, again formed of two substances, iron and oxygen; and either iron or oxygen can be separated from the rust thus formed, as in the former case.

The number of these elementary substances as at present established, is fifty-five; though it may be presumed that some of them will still be found to be compound substances, as the knowledge of the means of investigating their nature advances; they are rather, therefore, to be regarded as undecomposed than as absolutely undecomposable. Science may indeed yet show that the number of elementary substances existing in nature is much smaller than is at present supposed. It may not be uninteresting to the general reader to append a list of these substances.

Alummum	Hydrogen	Potassium
Antimony	Iodine	Rhodum
Arsenic	Iridium	Selenium
Barium	*Iron*	*Silicium*
Bismuth	Lantanum	Silver
Boron	Lead	Sodium
Bromine	Lithium	Strontium
Cadmium	Magnesium	Sulphur
Calcium	Munganese	Tellurium
Carbon	Mercury	Thorium
Cerium	Molybdenum	Tin
Chlorine	Nickel	Titanium
Chromium	Nitrogen	Tungsten
Cobalt	Osmium	Vanadium
Columbium	Oxygen	Uranium
Copper	Palladium	Yttrium
Fluorine	Phosphorus	Zinc
Glucinum	Platinum	Zirconium
Gold		

It is not a little remarkable to consider that all the varied forms of which the earth is composed, or which are displayed on its surface, are formed of either one or more of the elementary substances above enumerated; but it is still more surprising to find that only four of these—carbon, hydrogen, oxygen, and nitrogen—enter into the composition of all organic substances, whether of animal or vegetable origin. The consideration of the properties of them is therefore of peculiar importance in acquiring a knowledge of the phenomena of vegetable life, as well as that of animal nutrition.

As the space devoted to the subject of chemistry in such a Magazine as this must necessarily be limited, a more cursory sketch of these elementary substances must be given than would otherwise be desirable. All notice of many of them must indeed, therefore, be omitted; and of those requiring notice, the space devoted to a consideration of their properties shall altogether depend on their importance in the animal and vegetable economy. Before entering on this subject, it will be well, however, to convey to the reader a general idea of the principles on which the nomenclature of the science is founded, as this will enable him to surmount many difficulties in understanding the meaning of terms which occasionaly must occur in the following papers on the subject.

(To be Continued.)

To Cure a Cough or Cold.—The editor of the *Baltimore Farmer* says, the best remedy he ever tried in his family for a cough or cold, is a decoction of the leaves of the pine tree, sweetened with loaf suagar, to be freely drank warm when going to bed at night, and cold throughout the day.

The Canadian Agricultural Journal.

MONTREAL, JUNE 2, 1845.

It may be considered unreasonable for us to complain of the want of attention to the improvement of agriculture, by persons who are not directly connected with agriculture. We conceive that every member of a community are bound by an obligation from which they cannot be absolved, to employ their best powers, so far as their circumstances and opportunities will admit, to promote the general interests of that community. Individuals in Canada who are in better circumstances than others, have generally acquired their wealth here, and chiefly from doing business with the people of the country. This is perfectly right, but it is also proper that these individuals should do all in their power to promote the general interests, by offering instruction and encouragement to those who require it, and who may have indirectly contributed the means of their wealth. We have not here many, if any, wealthy individuals who come amongst us to expend wealth derived from another country. His Excellency the Governor-General has certainly done this, to an extent exceeding ALL his Lordship's predecessors in this government put together, and has expended his private income here in the most princely manner for the benefit of the country. The members of the government very probably conceive they are not under any obligation to give themselves the trouble to consider what measures might be necessary and possible to adopt to forward the improvement and prosperity of agriculture, as the duties of their several departments does not impose any obligation of this nature. The people who have to pay the revenue, however, are of a different opinion, and believe that in all the British Colonies the Governments have it in their power to produce a vast amount of benefit to the Colonists, if they would employ the power and influence with which they are invested, to the greatest advantage for the people, by instructing and encouraging their industry. This is much more necessary in the Colonies than in the mother country, where there is a powerful, enlightened, and wealthy aristocracy, that are deeply interested in the instruction and encouragement of the people. We have not the slightest doubt that much good might be effected by the government taking a direct and active interest in promoting the improvement of agriculture, which is the only means of existence for nine-tenths of our population. If it is possible that this could be done, would it not be desirable to try the experiment. There is not one individual in His Excellency Lord Metcalfe's government, who is not under an obligation to the country from which they derive honor, station, and emolument, to do all that is in their power to promote the general welfare of the people, and towards accomplishing this end, to give instruction and encouragement where it is most decidedly required.

AGRICULTURAL REPORT.

We never have seen a more changeable temperature, from hot to cold, and from cold to hot, than we have experienced this Spring. We have had frost several nights in June, even so late as the 17th. We do not think, however, that the crops have suffered materially, except that vegetation has been considerably retarded. We have had rains occasionally, but the great prevalence of unusually high winds drys up immediately any moisture that falls. The crops have, nevertheless, a healthy appearance, and may turn out abundant, though they are backward at present. We believe sowing and planting is now very generally completed, and a large quantity of wheat has been sown this Spring. We hope it will succeed, and escape the fly and rust. The price of wheat may not be very high, but it is likely to command constantly a fair price, and a certain market, and this is what is necessary for the farmer, to encourage and remunerate him. There is not any species of crop which will pay the Canadian farmer better than wheat, provided he can grow good crops of that grain, and we think it is possible to do so, if the soil is suitable, judiciously cultivated, and proper seed sown, at such periods as will escape the fly, and will not injure by rust. Such wheat we have now in the country, and we trust that it will prove the means of advancing the prosperity of farmers. The meadows have been injured by frost in March and April, and considerable patches have the grass rotted out. Except on the very best soil, and in excellent condition, the meadows have not much promise of a heavy crop of hay this year. It is possible there may yet be an improvement, but it will depend altogether on moist and warm weather for the next

two or three weeks. We do not, however, expect at present a very abundant crop of hay. We hear some complaints of the sickly appearance of potatoe plants, as if the seed was becoming unsound. We believe the safest mode for farmers, would be to plant whole seed of moderate size, and not apply too large a quantity of manure in the drills, in immediate contact with the seed. We have this Spring planted some potatoes on grass land, recently manured on the surface, and simply ploughed the land, planting the seed in every third furrow, harrowing the land after planting, and then shoveling in the furrows, at intervals of nine feet over the ridges. This experiment we have made on light soil, on which the surface was very tender. We have no doubt, if carefully executed, and the potatoes planted in May, it would be an easy and sure mode of procuring a crop. The land might be top-dressed with manure after meadow or pasture; the Fall provisions and this would in part rot the surface, or make it sufficiently tender to work properly in Spring. This season we conceive most favorable for the working of summer fallows. We, of course, suppose that land intended for summer fallow will have received the first ploughing last Fall, and will have received a second ploughing before now. This, however, is the period of giving proper attention to fallow, and not allow them to become covered with grass and weeds. They should now be thoroughly cleared, and all grass and weeds burned, and perhaps some of the clay also to assist as manure. Every farmer who understands his business will know that if he has farm-yard manure, or compost, to apply, that he must not think of doing so until the land is about to receive the last ploughing, and this should not be given to it until the Fall, and if intended for Fall wheat, immediately before the wheat is sown or ploughed in with the seed. When farmers find that the soil is not so much improved by fallowing as they expected, they blame the process as expensive, and not remunerating; but we are certain when this is the case, the fault is in the execution of the work, and not in the system. We have often stated our opinion of the great benefit of summer fallowing to strong clay soils, and we feel convinced there is no better mode for their improvement than this, if judiciously executed; but of course all its success will depend upon the manner of executing the work. If manure is to be applied, it is not at a period that all its best qualities will be dried out by the sun, on open, bare soil, with no crop to shade it. Last year we submitted in the French copy of our journal, a full detail of all the process of summer fallowing. We did not think it necessary to give it in the English copy, supposing that old country farmers were generally well acquainted with this work of the farm. We may in our future numbers refer to the subject again. There is a very sufficient supply of labour in the market at present, if farmers had means to employ it.

Cote St. Paul, 21st June, 1845.

The following article from the *London Agricultural Gazette*, is as applicable to the system of education that is general in Canada, as to that in England. Who, in this Province, ever thought of any necessity to introduce agricultural books or periodicals into the public schools? Reading-Made-Easy--the history of Goody-two-shoes--of Tom Thumb--or works of similar tendency, are much more likely to be found in our schools, than any works relating to agriculture which must form the chief dependance in after life, of nineteen-twentieths of those who are educated at these schools. The education of our schools teach nothing that has any relation to the occupation of the scholar's future life. Is not this, we would ask seriously, a most unaccountable inconsistency? It is a proof, however, of the correctness of the observations we made in our last number--"That general education taught everything but what was the most useful to mankind to be best known." Law, physic, the art of keeping accounts, &c., &c., are all taught, but the art of producing in the greatest perfection and abundance, all that is necessary for the very existence of mankind, is not taught, but is despised and neglected. We do not pretend to say that this journal is perfectly well calculated in every respect to give instruction in the art of agriculture, but we can say whatever may be its pretensions to usefulness, it is the only one of the kind published in Eastern Canada, and we can say further that it does contain, the newest and most approved discoveries in the art of agriculture now practiced in the British Isles, that is an example to all other countries. What has been told to us by respectable individuals who we have sent our journal to?—"Why do you send your journal to me—I never open it, do not read it, and will not pay for it. It is better you send it to persons

who will set some value upon it, and feel an interest in the subject to which it refers." This is the language of persons who, we know, owe their all to Canada, and of men who are in receipt of salaries, derived from the earnings of the people, and from the produce of agriculture which they so greatly despise. We do not make this statement to give offence, and if our journal was profitable to us, we should not attempt to make this complaint, but as we know it to be the contrary, and can refer to our journal as being calculated for usefulness, we conceive we are justified in stating what we do, and further, that many who would be highly indignant were you to question their patriotism, and love of the land they live in, would be far from paying a dollar annually, towards the improvement of Canadian agriculture, by supporting this or some other agricultural paper for distribution throughout the country in both languages. We have no doubt the time will arrive, when a different estimate will be made of things, and that they shall be valued in proportion to their probable usefulness. It is a very cheap mode of pretending to do good to the country by words and wishes, and it was this mode, and the absence of all judicious action, that has left the agriculture of Canada so much behind—and it is only a change in this general mode of action, in reference to agriculture, that will produce results that will be of advantage to all classes in the country.

We have constantly stated, the necessity and advantage of thorough draining of arable land.—We are quite sure that by sufficient draining, the soil would be rendered warmer, and the crops more certain, and early in proportion. A liming of the soil, we are also convinced, would be most beneficial, greatly tend to destroy vermin, and decompose baneful substances in the soil injurious to agriculture. It is impossible for a farmer to understand fully, the beneficial influence of thorough draining, and the application of lime upon land, who has not seen the effects produced by this system. Draining renders the land fit for cultivation at all times, and liming has that sort of influence upon the soil, that it destroys noxious substances, and brings into active production all that is fit to produce a crop. Lime is too high priced here generally for agricultural purposes, but there is no reasonable cause that it should be so, where we have abundance of lime-stone, and fuel. We hope the great facility we shall soon possess of water communication to the most distant parts of Canada, will encourage the burning of lime at a price that will induce farmers to use it extensively in agriculture.

There is in Canada an abundant supply of marl of every variety, and we have no doubt that by judicious application of it, suiting the variety of the marl to the quality of the soil to which it may be applied, a great improvement would be produced by it. An application of white shell marl to cover strong clay land, would produce a beneficial change in its texture, and upon the soil so as to be better suited for almost every species of crop. We have not had an opportunity of analyzing marl to discover its composition exactly, but we have tried some with vinegar, and by that test, we have seen marl here equal in quality to any we have ever seen. We shall make some experiments with it this year and report the results. The mixture of soils is an easy and certain mode for their improvement, and this is in the power of almost every farmer. The Chinese throw up the soil in heaps, and when it remains in that state for some months, they level it down again, and thus improve it by turning and exposure. They also mix soils to improve them.—Skill and industry may work wonders for the farmer, but one will not do without the other. Indeed it is our own opinion that any farm that is properly stocked and a judicious rotation of crops observed, may be kept in good productive condition by the manure made upon itself, with the help of composts and mixing soils. Of course, if it is a hay or dairy farm near town, that sells all the produce, what is taken from the soil must be made up to it in some way—but at a distance from town this need not be so. The sufficient drainage of land should go before all other attempts to improve it. This will enable the farmer to cultivate better, will improve the texture of, and the temperature in the soil, bring the crops to maturity in less time, and prevent, in a great degree, the injurious influence of early and late frosts which are certain to prevail more in wet undrained land, than in soils that are sufficiently dry.

In our present number, we copy a little work published in Ireland by the "Flax Improvement Society," on the cultivation of flax, which was kindly handed to us by James Mathewson,

Esq., of this City. There is no part of the process recommended in Ireland that would not be suitable here. We obtained the silver medal of the Natural History Society for an essay on the cultivation and management of flax and hemp, and it was published in the *Messenger* at the time, but not by the Society, as we expected. If we can procure a copy, we shall copy it in this Journal during the year.

We beg our subscribers will excuse us for the delay which has occurred in the publishing of this Journal for May and June, when we assure them it was owing to circumstances over which we had no possible control. We now, however, have made arrangements that for the remainder of this year, the number for each month will be published about the first of that month, without fail.

FEEDING FARM-HORSES.

The following are the modes of feeding, as well as the cost of the system practised by several farmers on light and heavy soils: 1. Soil with clover in the early part of the summer, grass the latter part. In winter, long hay, miller's offal corn, or baked potatoes, according to prices. 2. Soil at summer when practicable, or send out to grass. In winter, chaff, cut hay, oats, with carrots, at the rate of six bushels of oats and seven bushels of carrots for four horses during the week. 3. Five bushels of pollard with one cwt. of hay, half cut and half long, per horse. 4. Bruised barley and bran, with cut hay, and a small quantity of long in the racks at night.

On light land occupations.

	s	d
No. 5.		
1 bushel of oats	3	3
2 stones of bean-meal	2	4
½ cwt. of cut hay	2	0
Chaff	1	0
Per horse	8	7
No. 6.		
6 bushels of oats	18	0
2 ditto of beans	10	0
4 cwt. hay	16	0
Corn, chaff, and cutting	12	0
Allawance for six horses	56	0
Per horse	9	4
Extra allowance on journey	1	0
	10	4
No. 7.		
5 stone of corn (various	6	0
75lbs. long hay	2	4
Chaff	2	0
Per horse	10	4
No. 8.		
1 bushel of ground beans	5	3
4 cwt. of hay, cut for six horses, equal each horse to	2	8
Corn, chaff, add a few sweeds	1	0
	8	11
Extra allowance for journeys for six horses, 2 Bushels of oats in the spring, each horse about	1	0
	9	11

On heavy land occupations,

No. 9.		
5 bushels of oats	16	10½
2 ditto of beans	10	0
5 cwt. of hay	17	6
8 bushels of bran	6	8
Cutting	2	6
Allowance for five horses	53	6½
Per horse	10	8½
No. 10.		
5 bushels of oats	16	10½
1 ditto of beans	5	0
6 cwt. of hay	21	0
8 bushels of bran	6	8
Cutting, &c.	2	6
Allowance for five horses	52	0½
Per horse	10	4¾
No. 11.		
2 bushels of oats	6	6
1 cwt. of hay	3	6
1 coomb of cut hay	0	10½
Per horse	10	10½

12. I mow for them in the summer, feeding them in the stables and yard with green meat. In November, feed them on Swedish turnips, giving each horse six stone or one bushel and a half daily. About eight acres will carry my horses (15) through the winter months (about 38 weeks,) till the end of May. Upon this, with half-a-bushel of corn per week each horse, they will do well and consume but a small quantity of hay.—*Bacon's Agriculture of Norfolk.*

ON LIMING LAND.

The following analyses, for the Monmouth Farmers' Club, by Mr. Philips, of the Ordnance Geological Survey, show what great variety exists in the composition of limestone within but few miles of one another :—

No. 1. Limestone, Great Doward, Herefordshire.

Carbonate of lime,	56.8
" " magnesia,	39.2
Earthy matter and oxide of iron,	4.
	100

No. 2. Limestone, Stanton, Gloucestershire.

Carbonate of lime. with a trace of oxide of iron,	54.6
" " magnesia,	44.
Earthy matter, and oxide of iron,	1.4
	100

No. 3. Limestone, Whiteclift, Gloucestershire.

Carbonate of lime,	56.8
" " magnesia,	41.9
Earthy matter and oxide of iron,	1.3
	100

No. 4. Limestone, Stow Green, Gloucestershire.

Carbonate of lime,	98.6
Earth, matter, and oxide of iron,	1.4
	100

No. 5. Limestone, Ifton, Monmouthshire.

Carbonate of lime,	93.3
Earthy matter, and oxide of iron,	7
	100

Result of the use of the Stow Green Lime put on in a

caustic state in September and October upon the dry sandy meadows along the bank of the Wye (except No. 5) extending about two miles from Whitebrook to the village of Landogo, Monmouthshire, No. 1 being near Whitebrook, and No. 6 adjoining the churchyard at Landogo. Nos. 1, 2, and 3 were covered with rotten dung at the rate of twenty yards per acre between the years 1830 and 1834; the other meadows have not had any manure in the memory of man. The average produce of hay from these meadows when cut in season (without manure) for the last twenty years has been only from 10 cwt. to 14 cwt. per acre. A part of each meadow was left without lime, that a fair trial might be made, and the whole of the trials (except No. 6) were taken within three yards of each other; indeed many of the trials were within a foot; the line where the lime was put being so strongly marked, that a perfect stranger might tell what part was limed and which part not. The best plan is to put the lime in heaps of one or two waggon-loads, covering the heaps with a thick coat of earth till it is slaked, and then to haul or wheel it out in a caustic state, spreading it out of the cart or barrow. If the place where the loads are put down is shovelled out clean, there will in those places be the strongest crop of grass the following summer. Stow Green is within three miles of these meadows, and the price of the lime being 4s. 6d. per dozen, or 1½d. per bushel, the cost of manuring at the rate of 108 bushels amounts to 27s. per acre.

No. of Meadow.	The Autumn when limed.	Imperial bushels of lime put on per imperial acre.	What year mown after being limed.	Quantity of hay on the limed part per acre, more than on the part limed.	Remarks.
				Cwt.	
1	1842	108	1st.	4¾	From this trial it appears the more lime used the more grass.
		144	do.	10¾	
		216	do.	18½	
2	1835	126	3rd.	20¾	The limed part of this meadow may now be traced by a stranger.
			4th.	13¾	
			7th.	6¼	
3	1838	108	2d.	10¼	
			3rd.	20¼	
			5th.	11	
4	1838	108	1st.	4¼	
5	1835	126	3rd.	22	This piece has a barn on it, and adjoins the turn-pike road near the village of Landogo; although the part limed has had no manure since (now eight years), a stranger may at once see the great difference between this and the part not limed; the limed part being very superior in herbage and produce. In fact, as long as there is a blade of grass upon the limed part, the stock will not touch the other.
6	1840	108	3rd.	20½	

PLOUGHING-IN OF GREEN CROPS AS MANURE.

From Topham's "Chemistry made Easy."

In respect to the employment of green herbage, in raising crops of grain, pulse, or tuberous rooted vegetables, and the propriety of growing certain description of plants to be available for this purpose, with the prospect of obtaining a profitable renumeration, much difference of opinion among agriculturists, I am aware exists; and the locality of the estate, and the peculiar quality of the land, have probably much to do with the question at issue. Such species of herbage can only be advantageous, so far as, by its deeper rooting, it is enabled to extract, from the sub-soil, those properties which the crop it is designed to manure has not the capacity to reach; and the adaption of this system to his customary mode of culture, must be decided by the circumstances and judgment of the agriculturist. If, however, an individual living at a great distance from towns, and places where manures are readily to be procured, should be desirous of trying such mode of cultivation, or of extending it further than he has hitherto attempted, from being but imperfectly acquainted with the kind of herbage generally grown for that purpose; he will find the names of plants suitable, in a treatise lately translated into English, together with the constituents of which they are formed as recently determined by a scientific German Chemist (Sprengel); and from this work he can select those which may seem likely to suit his views; always bearing in remembrance, that the soil on which they are employed should be light and sandy, and when the herbage is ploughed in, the plant should be in flower.

CAPITAL FOR FARMERS.

The late Mr. Coke, when tenants came to him for farms, said, "How much money have you in your pocket? I have farms of every size, from £1,000 to £10,000; how much money have you got? Here is the list." "I have 1,000." "There are ten farms, take your choice." He had a farm for any man, with any amount of capital; and he used to say to them "If you have got a thousand pounds, you must only have one hundred acres. You have not enough to stock more. You must have £10 an acre, or you cannot manage your farms." And that, gentlemen, is at the bottom of the poverty which is so abundant in many parts of this country; it is ambition, sir—it is the abese of ambition, that prompts people to undertake more than they can perform; it is ambition that prompts a man to attempt more than he can carry out, and with £1,000 in his pocket to take a farm with which he ought to have £2,000.—*Dr. Buckland's speech.*

HORSE KEEP.

To the Editor of the Mark-lane Express.

Sir,—I keep ten horses upon the following plan;—I give them each 2 bushels of common oats per week, worth 4s., and 10 stones of potatoes, at 3d. per stone, making 1s. 6d. more; in addition to those I give them oat or wheat straw *ad libitum*. But I consider the the manure worth far more than the cost of it; my horses costing, as it appears above, only 6s 6d per week each, are hard worked, and keep up their condition admirably. I boiled the potatoes at first, but find they eat them best raw when clean washed. Potatoes can be bought at Newcastle-upon-Tyne in any quantity, under 2l. per ton. If you will be so good as mention, upon your own authority, the quantity of nutritive matter they contain, in proportion to hay, you will perhaps come to the conclusion that no food whatever is cheaper for horses, as I find them by experience.

I am, sir, your obedient servant, A. B.

P. S.—I should mention that I give them all the refuse potatoes, so that the price ought not to exceed 2d. per stone.

ONE IMPORTANT CAUSE OF NON-IMPROVEMENT IN AGRICULTURE.

I had occasion to visit the son of a friend of mine, at a school of great respectability in a wealthy agricultural

district. The master, a very intelligent person, showed me the details of his well-arranged establishment, which was certainly a pattern in every respect. On entering the well-filled school-room he observed, that most of his scholars were farmers' sons. Glancing at his library I enquired what books on agricultural subjects it contained? The master seemed struck with surprise (as if the thought of such books had never occurred to him,) and replied, "With shame I acknowledge, *not one*; but send me a list of such as you recommend, and I will procure them." Now, I apprehend this case might be multiplied by a thousand or more. Can we wonder then that a youth who never heard the word agriculture at school, and who is seldom or never sent into different districts to be taught agriculture as a science, should go home to his parent, and follow his plan of farming—be it good bad or indifferent. In all other trades and professions an apprenticeship is considered essential to the acquirement of knowledge; but farming, the most necessary of all trades, is to be left to chance, or rather mischance. A system of uniformity is essential in making a hat, coat, or shoes—there are established educational rules for the church, the bar, and the senate; but agriculture, the greatest interest of all, on which our very existence depends, economically and politically, is to be like a ship without a compass, tossed about by the ever-varying gale of individual opinion, without a hope of reaching the port of Perfection. Were a youth ever so much inclined to furnish his mind with comparisons and observations of the various systems of culture in our own different counties, as well as in *foreign* climes, there is, under the present school system, no opportunity for his doing so; and, no doubt, he would be surprised if told that we are a century at least behind the Chinese in agricultural practice. I hope we shall soon see every school, and, in fact, every farmer's parlour, possessing a few sound practical works on agriculture. I presume no man will consider he knows every thing in agriculture—if he does it is unfortunate for him. Little as I am acquainted with the subject, I am daily convinced that it is full of interest, and of such extent that a lifetime of study and practice would find us on the wrong side of perfection.—*London Agricul. Gaz*

ROTATION OF CROPS.

While there is no great attention paid to draining, subsoiling, and the application of artificial manures to the improvement of agriculture, there has not been that attention paid to the necessity of a judicious rotation of crops as the subject requires. Let the land be supplied with all the chemical elements of vegetation in abundance, if the same crop is sown two or three years in succession, it will be found deficient; also when crops nearly allied succeed each other. For instance in strong land, if one part is sown with oats and another with beans, afterwards fallowed and treated exactly alike and sown with wheat, the crop will be better on the bean part. Although the cause has not been satisfactorily accounted for on chemical principles, it would appear that the excretions of the roots of one cuiniferous plant are injurious to those of another of the same family, or that the one abstracts some peculiar principle from the soil essential to its vigorous growth. In like manner, red clover in the four-course system, after a number of years is found to fail, not, as has been stated, from a dificiency of gypsum (sulphate of lime) in the soil; for the application of that substance, although attended with beneficial results in some cases, has not altogether cured the evil, and in others (an instance of which occurred in this neighbourhood) entirely failed. In land that was sick of clover, instead of sowing it every time of fallow, I have missed it once in a course, so that the interval between the crop was seven or eight years; this plan, as far as I have observed, is attended by a complete restoration of the crop, and is the best to adopt in the present state of our knowledge.—*English Paper.*

BEANS AMONG CORN.

White beans may be planted in each hill of corn without much increasing the labour of tilling, and as you will often harvest about as many beans, with the corn as without it, the economy of planting both together on suitable soils is good. Some of our farmers say they can harvest ten bushels of beans from an acre that has fifty bushels of corn on it, and that they can perceive no injury arising to the corn crop from the proximity of the beans.

White beans may be planted as late as the first of June, and it is better to plant them after the corn is up than before, for they ought to stand on the south side of each hill. The labour of preparing an acre for planting, and then of tilling the plants through the month of June is no small affair; we must therefore have a good harvest or we lose money by the operation. Fifty bushels of corn, ten bushels of beans, and twenty bushels of turnips, or their equivalent in pumpkins, together with all the corn stove that will grow on an acre, will repay the labour of tilling and will leave something for the use of the lands and the manure.—*Mass. Ploughman.*

GRAFTING CURRANTS.—The Gardener's Chronicle recommends for the pretty appearance presented as well as for improved flavor; to graft currants of different colors, as the red, black and white, variously intermixed, on stocks trimmed up to a single stem three or four feet high. The tops may be headed down to a dense compact head, or trained as espaliars in the horizontal or fan method, the two latter modes of training, by the free exposure to sun and air, much improved the quality of the fruit. The importance of trimming the bushes up to single stems to improve the fruit and facilitate clean culture, instead of suffering two hundred and fifty suckers to shoot up all round into a dense brush heap, is very obvious to those who have tried both.

EXTRAORDINARY SHEEP.—The carcass of the sheep "David," of the "New Devon" breed, was exhibited in our cattle market on Friday last, and was the admiration of hundreds of agriculturists, butchers, &c., who crowded that part of the market for the purpose of seeing it. It was pronounced one of the most perfect sheep ever shown in this part of the kingdom. It was a wether, yeaned, bred, and fed on the farm of Mr. Thomas Kingdon, of Chapel St. Martin, Thorverton. This extraordinary sheep, remarkable for its smallness of bone, colour, and handsomeness, was three years old off, and slaughtered and dressed in a most tradesman-like manner by Mr. Robart R. Prowse, of *Thorverton. It weighed 265lbs.*, being 66lbs. per quarter, and one pound over; and carried 25lbs. of rough fat! Mr. T. Kingdon has in his superior flock (also of the "New Devon" breed, a sheep much heavier than this, which is named "Goliah," and understood to be *intended to be slaughtered and exhibited in* the Crediton Market in the spring.—*Exeter Flying Post.*

THE BEST MANURE.—But there is a manure which when properly managed, is of greater importance to the Irish farmer than any derived from a foreign and uncertain source—*that is, farm-yard manure.* Chemical examination teaches us, that in this we have, all the elements necessary to vegetable life. Nature always producing offal enough to preserve her power of reproduction unimpaired, when her supplies are properly husbanded by man. By mixing the waste straw of the farm-yard with the excretions of animals, we form a mixture containing all the materials which our crops can require for their development. In the decomposed stalks of plants we have silica, in a state capable of being taken up by corn and grasses, while the excrements of man contain a rich supply of phosphates; and urine furnishes by its decomposition, abundance of ammonia, and other valuable principles. A mixture so prepared will, by the economical farmer, be considered as superior to guano, for that substance does not contain all the elements which plants require for their food. If you neglect the manure lying at your own doors, you are neglecting the true remedy provided by nature herself for restoring the fertility of the soil; and, when you are informed that, with every pound of ammonia which escapes from a manure heap, 20lbs. of corn, and with every pound of urine which we allow to waste, 1lb. of wheat might be produced, you will,

I trust, be convinced that it is your interest to adopt some means for their preservation.—*Hodges' Lecture on Agricultural Chemistry.*

Agricultural Improvement.—Having often observed the great and expensive waste of substances and liquids possessing the most fertilising properties, I began to consider the best method of saving and applying it. There is a great waste of slaughter-house washing and garbage, not any of which should be lost; it should be laded up and put into a water-tight cart or cask, and conveyed where it is to be used, thus:—Make a trench, as if going to plant celery, pour and put into this trench the above matter, and turn a little earth lightly over it; at about eighteen inches or two feet distance make another trench, and sow or plant what you wish—vetches and a few oats, with clovers, which are good for horses or cattle, and will thrive and cut in February or March. You may sow sunflower-seed, which is very productive: every part is useful, every animal will fatten on the seed, and horses and cattle will eat the stem and leaves. When the sunflowers are about eighteen inches or two feet high, put stakes at proper distances, and tie long sticks across from one to the other; these will be very serviceable to support them, and fully repay the trouble. Observe, I particularly call your attention to the use of slaughter-house washings, blood, and garbage: to these may be added all the soap-suds and slops of the house; or make a manure-heap, in the upper corner of your field or garden, of dry leaves, &c., making it a little hollow in the middle, and there throw your soapsuds and slops.—S. C.

How to Raise Turkeys.—The attention of our readers has been repeatedly called to the subject of poultry—in the vicinity of our large cities, perhaps no stock is so profitable. Some good practical hints may be taken from the following, which the editor of the New Jersey Journal gives us the result of considerable experience of his own. The young turkey is proverbially a tender chick, and it is a nice matter to know how to manage him properly. [Farmer's Cabinet.

We believe it is common among farmers to say that a turkey's head costs twice as much as its body is worth when fattened. This we do not believe to be true, if he is properly managed; but on the contrary, we believe that nothing can be raised and turned to so great a profite But turkeys must have care, especially when young; but this care will not entrench on the business of the farmer, as it may be done by females or the younger branches of the family—and beside, the little damage they may do to grass or other things, must not be magnified tenfold, as is usually the case. But by proper attention they will do no damage at all.

Before giving our rules to be observed in raising turkeys let us draw a comparison. There are but few farmers but can raise 100 turkeys,—these 100 turkeys will weigh, when fattened, in December, upon an average, seven and a half pounds each, full dressed. We say full dressed for it is the practice in some places to divest the turkey of nothing but its head and feathers, and then take it to market. A practice as uncivilized as it is disgusting. These hundred turkeys then will weigh 750lbs., which in market are equal to 1,500 lbs. of pork. But if the male turkeys are kept until February or March, they will not only increase in weight, twice the amount of their feed, but the price in the market will be much higher.

We will now give the rules to be observed in raising and fattening them, founded wholly on our experience. Turkeys intended for breeders must be kept well during the winter. Is put in good condition, however, in December, it takes but little feed to keep them so Their nests for laying must be made with hay or oat straw under cover, and be well protected from the weather, and from vermin. When incubation commences, the turkey must not be disturbed, and if she does not come from her nest for food and water, she must have both placed by her on her nest. When the young turkeys are hatched, they may be allowed to remain one day on the nest, or if removed, let them be sheltered in a warm place, and plenty of straw for them to set upon, for they are now extremely liable to take cold. The second day feed them with curds, or warm clabbered milk mixed with a little Indian or barley meal. They must be kept up and fed in this way for two or three days, and longer if the weather should be cold or rainy, but as soon as a warm and pleasant day comes, let them out at nine or ten o'clock, and shut them up at four—and this practice of letting them out and shutting up *must* be followed for five or six weeks, and on no account let them get wet. When a young turkey begins to droop there is but little hope for it. There is no danger of keeping them too warm. When they are five or six weeks old put a little grease on their heads to preserve them from lice.

At the age of six or eight weeks the turkey is more hardy, but still should not be exposed to rains or the damp nights, for a few weeks longer. If the farmer has a plot of grass let him enclose a yard with a high fence, and crop the wings of the old turkeys, and continue to feed them with clabbered milk, and whatever else he pleases that comes from the kitchen, such as broken bread, potatoes, and the like. If he has a clover field, as soon as it is mown, let them run on it, and they will live on young clover. And as soon as the crops are off the ground, say in August or September, let them range on the farm; but see to it, that they come to their roosting place at night, and have water.

In December the turkeys will be large enough to fatten, and for this purpose select as many as you please, and shut them up,—next take to the mill a few bushel, of *ears* of Indian corn and have it ground-- then boil potatoes, and mix the meal with the scalding water and potatoes in a tub, say in the proportion of one bushel potatoes to one peck or more of meal, and stir them well together, then let it cool, but give it to the turkeys a warm as they will bear it, and as much as they will eat and in two weeks and a half, they will be fat enough for market, and for an alderman's dinner.

We do not take this from books, but from several years' experience. We kept an exact account of the expense of raising and fattening a flock, and at the rate of ten cents a pound full dressed—we received $72, while our cost exclusive of sour milk, was less than $19. If any farmer does not wish to be at the *special* trouble of raising them, but should have a small flock to fatten, that have lived "in spite of wind and weather," let him adopt our rules of fattening, and he will "save much corn." On a large farm, and with a large yard and a butter diary with proper attention we believe it may be made a leading business to great profit.

"Though we have repeatedly expressed doubts as to the utility of agricultural shows, we have none upon the importance of a better agricultural education than has hitherto been generally imparted to those who purpose pursuing the occupation of a farmer."

We are gratified in being enabled to quote an authority of such importance as the *Times*, in behalf of the advantage of "a better agricultural education" than has been hitherto given to those who would pursue the cultivation of the soil as their occupation. Scotland is again taking the lead on this subject, and we presume that as usual England will follow, in the course of another half-century. We are glad to observe in the south some movement in furtherance of agricultural education. The Agricultural College at Cirencester is making advance. We learn that at "a recent meeting of the Committee of the Cirencester Agricultural College, Mr. Scales, an experienced Norfolk farmer, whose acquirements are said to be first-rate, was appointed head master; and that he produced a most favourable impression on the committee on a personal interview. The committee is now in communication with a gentleman, strongly recommended by Dr. Daubeney and Professor Graham, as Professor of Chemistry." We heartily wish success to the enterprizing and persevering individuals who are the promoters of this establishment. As bearing on this subject, we have much pleasure in noticing the establishment of an agricultural training school about to be opened at Hoddesdon, Herts, on the 14th instant, under the direction of a committee of management, for general and scientific educa-

tion, including every branch of agriculture. The resident head master is Mr. Haslewood. The professors for the different sciences are—*Agriculture*—Professors Austin, Gough, &c., &c. *Botany*.—Professor Cooper, F.L.S., Author of "The Botany of Sussex," &c. *Chemistry*—Professor Holmes, five years Lecturer at St. Edmund's College. *Geology, Mineralogy, &c.*—Professor Richardson, F.G.S., of the British Museum, author of "Geology for Beginners," &c., &c. *Management and Diseases of Cattle*—Professor Youatt, M.R.A.S., author of "The Horse," "Shee," "Cattle," &c. *Practical Surveying and Levelling*—Mr. Haslewood.

The school session will be divided into two terms, viz.—from the 14th January to Midsummer; and from the 30th July to Christmas. The course of education will embrace the classics, mathematics, mechanics, physics, chemistry, botany, mineralogy, geology, land surveying, drawing, the French language, practical agriculture, and lectures on the breeds, management, and diseases of cattle. A library, museum, and laboratory, will be attached to the school; and the charge for board, lodging, washing, lectures, &c., &c., will be so arranged by the committee of management as to include every expense (except for books,) at twenty guineas the half year. A separate class will be formed for those pupils who are not sufficiently advanced to attend the lectures, the charge for which will be sixteen guineas the half year. Any pupil may omit the classics, or such other portions of the general education as may be desired; and devote his whole attention to the lectures and practical agriculture. This is a most spirited undertaking for a single individual, and really deserves encouragement. We are given to understand that a considerable number of pupils are already entered to begin on the 14th.

CIRENCESTER AGRICULTURAL COLLEGE.—The committee of the proposed new college have selected the design of Messrs. Dakes and Hamilton, architects of Gloucester and Cheltenham, from a large number, among which, we understand, were some from architects of great eminence in London. The college will occupy the delightful site on Lord Bathurst's grounds, known as Port-farm, near the railway station at the junction of the Stroud and Tetbury roads, thus presenting a perspective of two bold fronts; the farm itself being attached to the end of the main buildings, altered to meet the domestic requirements of the institution, and decorated sufficiently to be in character with the new structure, which, with this addition, will form an entire frontage of nearly 250 feet. The design is in the Tudor style, of three stories high; the upper story being lit with picturesque old-fashioned dormer windows, of the style so prevalent among the collegiate buildings of Oxford. The centre is occupied by a bold tower, the upper part of which is intended to form an observatory for meteorological and other scientific purposes. We understand that the committee intend to complete only the main portion of the building at present, and that the works are to be speedily commenced.—*Wilts Independent.*

NUTRITIOUS FOOD.—A very interesting report on the comparative nutritive properties of food was lately presented to the French minister of the interior by Messrs. Percy and Vanquelin, two members of the Institute. The result of their experiments is as follows:—In bread, every hundred pounds' weight are found to contain 80 lbs. of nutritious matter; butcher meat, averaging the various sorts, contain only 31 lbs. in 100 lbs; French beans, 25 lbs; peas, 23 lbs; lentiles, 94 lbs; greens and turnips, which are the most aqueous of all vegetables used for domestic purposes, furnish only 8 lbs of solid nutritious substance in 100 lbs; carrots, 14 lbs; and what is very remarkable, as being in opposition to the acknowledged theory, 100 lbs of potatoes only yield 15 lbs of substance valuable as nutritious. According to this estimate 1 lb of good bread is equal to 2½ or 3 lbs of best potatoes; and 75 lbs of bread, and 30 lbs of butcher meat, are equal to 300 lbs of potatoes. Or again, 1 lb of rice or of broad beans, is equal to 3 lbs of potatoes; while 1 lb of potatoes is equal to 4 lbs of cabbage, and to 3 lbs of turnips. This calculation is considered perfectly correct, and may be useful to families where the best mode of supporting nature should be adopted at the least expense.—*Chambers' Edinburgh Journal.*

PRODUCTS FROM MANURE.—Experments in Germany have led to the following conclusions:—If a given quantity of land, without any manure, yields three times the seed employed, then the same quantity of land will produce five times the quantity sown when manured with old herbage, putrid grass or leaves, garden stuff, &c., seven times when manured with cow dung, nine times with pigeon's dung, ten times with horse dung, twelve times with goat's and sheeps' dung, fourteen times with human manure or bullock's blood.

System and calculation are as necessary in farming as in commerce and manufactures.

DEATH OF JAMES ELLIS, ESQ., OF BARMING

It is with deep regret that we have to record the death of this most estimable individual, in his 76th year, which took place on Sunday se'nnight, at his residence at Barming. For some months past, in our frequent interviews with him, we have seen with much concern a gradual prostration of the bodily frame, while the mental structure has evidently retained all its wonted elasticity and vigour. Mr. Ellis was born at the Southovers Farm, in Burwash parish, Sussex, and lost his father at a very early age, when, in fact, he was but four years old. The advantages of education, as we should apply the term in the present day, were denied to him, but he possessed those innate qualities of the mind, which in the opinion of many are superior to extensive advantages. How long or under what circumstances he continued in Sussex after the death of his father we have not been able to ascertain with any degree of accuracy, probably by being employed in the Southover and Winter's farms, which were owned or rented by his family, and ultimately were enjoyed by himself. He removed to Barming, in Kent, about 43 years ago, and since then his career has been almost wonderful. He is said to have made and lost more fortunes in agricultural pursuits than any man in existence. One year realising upwards of £60,000, and in a few subsequent years (from the very precarious and fluctuating state of the growth and sale of hops) losing nearly as large an amount. He was unquestionably the largest hop-grower in the world, and at one time had in cultivation nearly 9)0 acres of hops alone, besides arable and pasture land. At the time of his decease he held 600 acres of hop ground, 200 of which were in Essex and the remainder in Kent; while the land owned or rented by him, in addition, consisted of 90) acres in E-sex, 1,100 in Kent and about 2)0 acres in Sussex, making a total of nearly 2,700 acres. The number of labourers he employed is almost incredible. The average number weekly was not fewer than 600, and in the hop-picking season at least 3,100 were the recepients of his wages. Kind, humane and considerate, his old servants were the particular objects of his care, and he never parted with any without some powerful motive. While making inquiries for this brief sketch, we encountered an old labourer, who said, with great feeling, "Master was a kind good man, sir. He would have his work done well, but we were always certain of our reward." From circumstances that would have depressed many, Mr. Ellis appeared to rise with renewed strength—not merely to combat the difficulties that

surrounded him, but to overcome them. He was one well qualified to "ride on the whirlwind and direct the storm" of agricultural distress or spoilation. His efforts for remedial measures were not selfish, for he was ever anxious to promote, on general grounds and with most liberal feelings, what he considered essentially for the benefit of the agriculturists, more especially for the labouring portions of it, as was evinced in his struggles to the last for the abolition of the Malt Tax. In person Mr. Ellis was above the middle height; in manners he was indeed the "fine old English gentleman"—urbane to a d gree, and perfectly accessible to all who had the slightest claims upon his valuable time. In matters of business he appeared to possess almost ubiquitous powers, for even during the last season, while the hops were being picked, he was almost incessantly in one or other of the gardens or oast-houses in Kent. From his long experience as a hop-grower, he was unwilling to adopt modern innovations, and upon a recent occasion, when the writer of this article mentioned to him a newly invented patent article, Mr Ellis replied, with one of his most affable smiles, "I am obliged to you for pointing it out to me, but at my age if I don't understand growing and drying hops I had better give it up. Let your new plans have the number of years experience that I have had, and then let us see what the *improvement* is." Mr Ellis was thrice married; his first lady was Miss Johnson, of Buxted, who died in childbed: the second was the widow of Mr. John Selby, by whom he had one son; the third, his present widow, was Miss Robinson, of Havering, at the Bower, Essex, who has a family of six children. The great object of Mr. Ellis's life, for many years past, has been the removal of the Malt Tax, and it was while attending a meeting for the purpose at the Freemasons' Tavern, that he was seized with his last and fatal illness.—*Sussex Express.*

MISCELLANEOUS ITEMS.

At a tannery, near Leeds, (the largest in the kingdom), the proprietor has at present a contract to supply, to one house alone, 2,000 hides weekly. There are weekly turned out from the same tannery 5,000 hides. In one yard there are four hundred and twenty pits, and two large steam engines on the premises to pump water.

The French have introduced a new manufacture by making stockings wholly of indian-rubber thread; they are made by a machine, and are said to be excellent in preventing rheumatic pains.

Truth Immortal.—No fragment of truth ever dies. From time to time the body dies of it; but it rises in a more perfect form, leaving its grave clothes behind it, to be, perchance, worshipped as living things, by those who love to watch among the tombs.—*L. M. Child.*

Persevere.—Many of the blessings universally desired are frequently wanted, because most men, when they should labour, content themselves to complain; and rather linger in a state in which they cannot be at rest, than improve their condition by vigour and resolution.—*Rambler.*

Sociality.—We are but passengers of a day, whether it is in a stage-coach or in the immense machine of the universe. In God's name, then, why should we not make the way as pleasant to each other as possible? Short as our journey is, it is long enough to be tedious to him who sulks in his corner, sits uneasy himself, and elbows his neighbour to make him uneasy also.

The Tavern.—Learn to love home—avoid the tavern. It is in the tavern that the devil draws up his army, arrayed against the brains and good resolves of men. It is there that he reviews his legion of bottles, and prepares them for the attack upon weak humanity.

A bible and a newspaper in every house, a good school in every district, all studied and appreciated as they merit, are the principal supporters of virtue, morality, and civil liberty.

In the first place, take care ye never begin to speak till ye have got something to say; and, secondly, be sure to leave off as soon as ye have done.—*Witherspoon, Advice to Orators.*

Wonderful Engine.—It is alledged that a wonderful engine, called the air-engine, has lately been constructed by Professor Reinagle, who is securing patents in every civilized country of the earth. The power, which is self-produced in the engine, is obtained from condensed air, which, though easily managable, begets an immense force, the present engine, which stands on a space not exceeding two feet square, having a power equal to five hundred and sixty-eight horses. For pumping water out of mines it is gravely proposed to use a 10,000 or 20,000 horse-power in order to do the work promptly. It is stated that, with the present small engine, two hundred and twenty tons can be propelled at a rate of twenty-five to thirty miles per hour. The description of the action of the machine is very vague, but it is said that several very eminent and scientific men have examined it and expressed their astonishment. Professor Faraday, having seen the drawing and heard the theory and practice of this invention explained, complimented the inventor by declaring, that he had discovered perpetual motion of the most terrific description.

A plan of warming a house, from the back of the kitchen-grate, has been adopted by Sir Charles Menteath. A cast-iron back, an inch thick, is fixed to the grate, and another plate of sheet iron placed at a distance of one or two inches from the cast-iron back, shows a species of stove, which serves to warm the under-ground story of a house; and, by means of a circulation of air passing between the two iron plates, a current of *warm air*, by means of a pipe from the hot chamber between the iron plate, is carried to the next floor above. The air is heated to 190 degrees by this simple and economical method. The wall is hollowed out to the passage or room behind the kitchen grate. The placing a thin plate of sheet iron behind the fire of a cottage grate adds much to the comfort of the inhabitant. All cottages should consist of two rooms, with a wall in which the grate of the cottager is placed, so that the back of his grate warms the room behind, and dries his clothes.

We had the pleasure of seeing these models in the model-room of the Scientific Institution, which met in Newcastle in August last; and doubt not, what is recommended, will be of essential benefit.—*Dumfries Times.*

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