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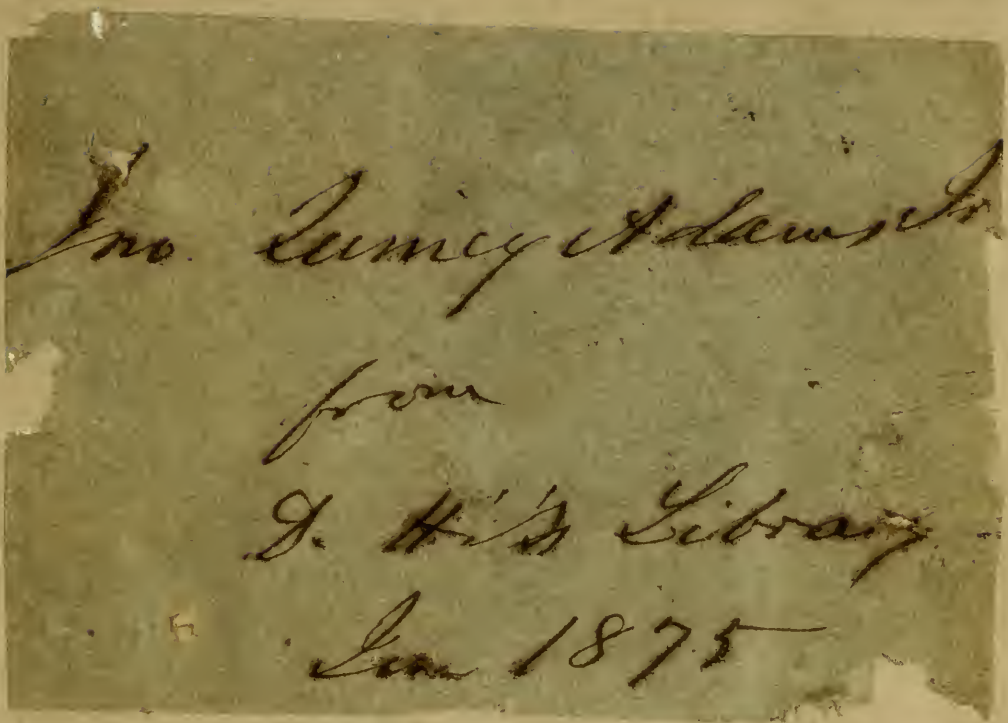
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THE

EXPERIENCED FARMER,

AN ENTIRE NEW WORK,

IN WHICH THE WHOLE SYSTEM OF

AGRICULTURE, HUSBANDRY

AND

BREEDING OF CATTLE,

IS EXPLAINED AND COPIOUSLY ENLARGED UPON;

AND

THE BEST METHODS, WITH THE MOST RECENT IMPROVEMENTS, POINTED OUT.

BY RICHARD PARKINSON,
OF DONCASTER IN THE COUNTY OF YORK.

IN TWO VOLUMES.
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THE

EXPERIENCED FARMER.

SECTION L.

The Sort of Land to be pared and burned; the Uſes and Imperfections.

THE ſort of land generally thought to ſtand in need of paring and burning is that which cannot eaſily be pulveriſed by other means, ſuch as moſs, ruſhes, and coarſe graſſes of all kinds. Land of good quality of any ſoil, if it has been eaten by ſheep, ſeldom requires paring and burning; for ſheep, when mixed with cattle and horſes, eat land ſo even that the ſward may eaſily be pulverized. In that caſe it may be unneceſſary to pare and burn.

Moor land of all ſorts ought to be pared and burned. Heath-land ſhould likewiſe be pared and burned, on account of the ſort of graſs it produces, the ſtems and roots of which are like wire, and would not rot for many years: and when the roots of graſs remain in land, they impede the growth of corn, turnips, &c.; as may be eaſily conceived from their robbing the earth of the nutritious particles which ſhould be diverted into another channel. Theſe roots are very ſtubborn, and not eaſily deſtroyed, even when the land is ſown with turnips; for, when the turnips become ſufficiently large to admit of the hoe, by running amongſt them they are very troubleſome, and cannot be removed.

The graſs roots alſo ſerve as a harbour for worms, where they breed and increaſe in a very great degree; and when the land is ſown with corn or turnips, the graſs roots are ſo entangled, that the rooks in ſearching after the worms, pull up the corn and turnips.

It is this which fixes ſo bad a character on the poor rooks, who certainly do not feed on the roots of corn, turnips, &c.: but they are under

under the neceſſity of pulling them up in ſearch of their prey—the huſbandman's enemy. In ſummer, rooks will be equally buſy on the ſwarth in ſearch of worms and grubs; for which we are under obligations which we have ſeldom the gratitude to acknowledge. Moſt huſbandmen, indeed, hate a rook as much as they do the fox.

The only effectual method to clear land when injured by roots, worms, &c. is to pare and burn. Burning deſtroys worms, old and young, together with their eggs. It alſo deſtroys the moſs, and graſs as well as roots. Theſe roots, in addition to the miſchiefs already mentioned, keep the land light, by perforating it in ſuch a multitude of places; by which means the air is admitted, and a greater fermentation is occaſioned than is neceſſary to the vegetation of the plant; and the land riſes in bliſters.

The aſhes procured by burning, and when the fires are made on the land, ſerve the purpoſe of manure for two or three crops: and were the ſtraw made into manure, and return-

ed

ed to the land, even the pooreſt of the above ſoils would receive conſiderable benefit, and turn out of great advantage to the farmer; as by the time the aſhes moſt probably would not be exhauſted, and, when mingled with the other manure, would preſerve the oily quality in which conſiſts their virtue.

We well know that crops of any kind leſſen the fertility of the ſoil, and will in time exhauſt the richeſt, if not ſupported and renewed by the aſſiſtance of manure. As to poor ſoils, they would, unleſs aſſiſted by art, ſoon be ſo worn out as to produce nothing but weeds, and often little of them. As we have ſuch perfect conviction that the uſe of manure properly applied creates abundance on all ſoils; it follows, that, if paring and burning cauſes more manure to be made, it is proper paring and burning ſhould be more uſed than it is at preſent. I think every farmer will allow that the loſs of one crop frequently occaſions the loſs of many; as it certainly diminiſhes the dunghill: but what adds to the dunghill will not impoveriſh the land, provided it is returned as it ſhould be. Some are of opinion that paring

and

and burning diminiſhes the land: and ſo it muſt in ſome degree, though it may leave a larger portion of vegetative ſoil. Were the ſward taken from any field, laid in heaps, and mixed with manure ſufficient to cauſe a fermentation, which would in a degree deſtroy thoſe reptiles and inſects ſo injurious to all crops; that would be of greater advantage to the land than the preſent mode of ploughing up old ſwards without paring and burning: for, in that caſe, the greater the plenty of worms, &c. the better, as their carcaſes would enrich the manure. I own that the expence of labour is an objection to this ſcheme, and that it would require a large quantity of manure to prepare a poor ſort of turf for readily working down in a proper manner to be laid on land, to make it ready for corn; for, if it were not thoroughly worked into mould, it would prove injurious inſtead of being beneficial to the crop.

It may be ſaid, that this method would raiſe a large hill of turf. But it is to be recollected, that the ſort of turf meant has but little fertility in it without fermentation; and more of

it

it would not be required than juſt enough to imbibe the ſuperfluous juices draining from the manure. A greater quantity would be of detriment inſtead of benefit; for, I have turned manure over in a fold-yard, in a dry ſeaſon, where a deal of ſtraw perfectly dry had been ſtrewed in the ſpring months on the top of the dunghill; and from there being a greater proportion of dry ſtraw than the moiſture abſorbed by the dunghill could properly ferment, the manure, when carted away, was more dry than when it was firſt turned over. The heat of a hayſtack will cauſe the watery particles to evaporate perceptibly: and, by turning the manure I ſpeak of, it was ſo much injured as to be conſiderably worſe for the expence beſtowed.

Peat, turf, moraſs, are one kind of ſoil: though there is ſome difference in the particular ſorts, they require the ſame management. Heath-land, although it varies very much, producing ſhear-graſs, on ſome parts moſs, on others a ſort of pry-graſs, yet requires the ſame management. Theſe are all proper lands to be pared and burned.

If

If you have any ſort of ſoil in nature ſo poor as to convince you it will not bring a crop without artificial aſſiſtance, and you can find turf or ſward upon it ſufficient to pare and burn, and by that operation improve the land ſo much as to enable it to bear a crop, which otherwiſe it could not have done; who can find fault with ſuch proceeding? I could mention innumerable inſtances where paring and burning has ſucceeded moſt wonderfully. Sometimes the tenant, through poverty, is not able to bear the expence: but moſtly the averſion which gentlemen or their agents have ſo unaccountably contracted againſt this practice, prevents the more general uſe of it. It is neceſſary to ſay, that you muſt take care that the ſods burn not too rapidly: for, if they ſmother gently, the aſhes will retain much of the oil which by an intenſe fire would evaporate. It is adviſeable to divide the ſods into a number of hillocks; as, wherever they are burnt, you may be certain of a good crop from the earth's receiving the oil which oozes out during the operation, and which the land will retain for two or three crops.

Though

Though this practice of paring and burning has met with so much opposition, I cannot perceive any injury a landlord can sustain by it. Barren soils are rendered fertile by it: and no tenant would offer to pare and burn a good soil, as that would be a waste of time and money.

When land that has been pared and burnt is laid down, supposing it even sown with seed of the same sort of grass; it will grow much finer, from the earth's being so easily pulverised, and of course admitting a free vegetation.

Some men do their business in so slovenly a manner, that they may plough a piece of land for six or seven crops, without once pulverising it sufficiently. And they will sow the crops one after another in this manner, because the land is fresh: but in all probability there will not have been one really good crop amongst the whole.

Let us now suppose that we plough heath-land without paring and burning, and that we sow it with oats. A very small crop only can be expected. If you then fallow and sow with turnips, none can be expected unless you manure

nure; and no manure worth mentioning has been made from the produce of the land itſelf. But it muſt be procured, or there will be no turnips, and very little barley: and, if then ſown with clover, little of that can be expected.

On the other hand, if pared and burned, and ſown with turnips, the crop will almoſt to a certainty be a good one; for they delight in aſhes. If the turnips be eaten off by ſheep, your oats and barley will be excellent: and if the field be afterwards laid down with ſeeds, you may rely upon an abundant produce. If you have clover, and mow it, you may expect good wheat after. Then fallow for turnips: you will have the land's own produce to furniſh ſix loads of manure per acre, which, properly applied, will enſure a good crop. This is the beſt method of improving poor land, and the leaſt expenſive of any I know. And if rich land be over-run with coarſe graſs, and be infeſted with grubs, worms, &c. no method will ſo effectually deſtroy them as paring and burning. Should any of the grubs or worms even eſcape the fire, they have ſuch an antipathy to aſhes that they muſt either change their reſidence or periſh with hunger.

I have treated of the culture of potatoes in Section XV. I am of opinion that potatoes would ſucceed extremely well after paring and burning. I never tried the experiment, nor do I know any one who has; but, where land is full of graſs roots, it is cheaper to burn than collect and remove them; and, in a bad ſeaſon for getting graſs-roots or weeds from the land, burning before the potatoes are ſet I think to be the beſt method. If potatoes are ſet the laſt week in May, or the firſt week in June, it would be early enough to have a good crop. If a man wants preſent profit, he cannot do better than ſet potatoes: if he wiſhes to improve the land, let him ſow turnips, and eat them off with ſheep. If the tops of potatoes, inſtead of being ſuffered to remain on the ground until they periſh, were cut in time, it is certain they would afford food for numbers of cattle; and you might continue cutting them through the ſummer for that purpoſe, and thus raiſe a large dunghill for the benefit of the land; but it would injure the potatoe-root.

I have already obſerved, that moor-land is of the ſame kind as heath: and I would recommend

mend, after paring and burning, a crop of rape to ſtand for ſeed. There will be ſufficient time for that purpoſe; for, if it be ſown in Auguſt, it will be early enough. I have ſeen a very good crop, the ſeed of which was not ſown before September. The leaves of rape, by ſmothering and by falling in ſuch abundance upon the land, enrich it (by the oil they contain) in almoſt as great a degree as the ſeed impoveriſhes it: and were the ground immediately cleared of the rape-ſtraw, roots, ſtalks, &c.; plough ed, freed from weeds and rubbiſh, properly pulveriſed, ſufficiently limed, and then ſown with wheat; it would enſure a good crop. This ſort of land may be carried on five or ſix years by lime, before you have it in graſs again: and were you to debit the reſt of the farm with the produce of it in the article of manure, there would be at leaſt twelve loads due to lay upon it with the ſeeds, or after the firſt year of depaſturing it.

In very ſtrong clay, aſhes will prevent that cloſe adheſion of the parts which is ſo great an enemy to vegetation. In a ſandy ſoil, aſhes, lime, and manure would furniſh a compoſt that would

would produce every uſeful grain and herb cultivated in England.

SECTION LI.

Surface-Draining, and Under-Draining; Uſes of them; what Land moſt proper for each.

SURFACE-DRAINING, though in general very badly executed, is perhaps one of the greateſt improvements in agriculture and grazing that has been made of late years. Unleſs land be laid properly dry, it is ſcarcely poſſible that any uſeful plant can proſper, or the uſeleſs be deſtroyed. Ruſhes, for example, of which there are many thouſand acres, ſpoiling land which might with great eaſe be freed from them by draining, are ſuffered to grow from neglecting to apply this ſimple remedy.

Every man who is troubled with ruſhes upon his land, complains of their growth: but few think of the cauſe of their propagation.

Sometimes, indeed, it is uſeful to the farmer to have ruſhes on his farm. The landlord who is averſe to the breaking up of land ſuffers the tenant

tenant to plough a ruſhy piece: and if it be afterwards properly drained, and finally laid down with ſeeds, the ruſhes will be nearly deſtroyed.

Ruſhes will not grow, or at leaſt, not arrive at any degree of perfection without moiſture. Either they muſt be fed with water from the ſurface of the earth, or derive nouriſhment from ſprings at a ſmall depth. A dry ſoil will not produce them. I had a proof of this upon the farm at Aby-Grange before-mentioned. A piece of land being very ruſhy, my father was permitted to plough it. The firſt crop was oats—the ſummer was remarkably dry. After the oats were got off, the land was harrowed, and ſown with cole-ſeed, which produced the beſt crop I ever had ſeen, when ſown ſo late in the ſeaſon. We had frequently tried to raiſe cole before for ſheep in the autumn, but it never came to perfection. I now know that we failed becauſe we ploughed the ground a common depth, and did not ſufficiently pulveriſe it. We relied upon the oats which were ſhaken out by the mowing, &c. growing and furniſhing great part of the food to be raiſed for the

ſheep

ſheep: but by ploughing ſo deep we had buried them. At that time I had no doubt but an oat would grow through a clod a foot thick! I agreed in opinion with farmers in that clayey country, who ſow wheat in autumn; and, if the ſeaſon proves dry, when they have moved clods with the plough, of eight or nine inches cube upon the wheat, wonder at ſeeing the crop ſo thin, and are puzzled to account for it.

But to return from this digreſſion to our crop of cole with the ſhed oats, as alſo to the ruſhes. The cole and oats were eaten off by ſheep, and the land fallowed, and ſown with turnips. The next crop, to make the fallow, we ploughed croſs-wiſe, in order to level the ground, as the furrows were very low, and the ridges very high. We then ploughed downwards; and, to pulverize the ſoil, made uſe of a pair of harrows with teeth like coulters, for which reaſon we call them *coulter-teeth harrows*. The land was harrowed acroſs and in every direction with them, until they had divided the roots of the ruſhes into millions of plants; ſo that we took the beſt poſſible method to propagate thoſe which the ſeaſon had not been ſufficiently dry

to

to kill. The third ploughing we ſowed turnips, and had a good crop, except on the top of the ridges, whence we had taken all the ſoil which had fallen into the furrows, leaving nothing but a hungry clay. I had not then ſeen roots of weeds raked up and carried off fallows. Therefore twitch-roots, ruſhes, and every noxious weed had liberty to grow, when the ſeeds were ſown: but the land, being freſh, had very little couch-graſs.

The next crop was barley with rye-graſs and white-clover. I tried an experiment by ſowing here and there a land without barley, to ſee whether it would be in a better ſtate in future than thoſe lands where barley had grown. But in two years the land *not ſown* was ſcarcely to be diſtinguiſhed from that which had been ſown: a proof that, if barley had been raiſed, and the ſtraw returned to the land in manure, the ſoil, inſtead of receiving injury, would have been improved by it.

The ruſhes grew ten times thicker than before the land was ploughed, and ſpread all over it, ridges and all. I thought the whole field would turn out a bed of ruſhes: but I was

moſt

moſt agreeably diſapppointed ; for moſt of them died away before they came to any ſize. The getting rid of this troubleſome weed is to be attributed to draining ; by the furrows being ſo much raiſed, and the ridges ploughed down. The drains had been cleared out rather deeper than they had ever been, as a preventative againſt the rot in ſheep ; and by making new grips or drains, the land was laid fairly dry, ſufficiently ſo at leaſt to deprive the ruſhes of nouriſhment : of courſe they died away.

Some may ſtart an objection, by ſaying, "Ruſhes grow upon dry land."—To appearance I own, they ſometimes do. The land may indeed be dry on the ſurface : but drain it properly and effectually, and, depend upon it, you will deſtroy the ruſhes.

On a heath conſiſting of many hundred acres, in an elevated ſituation, water had been ſought for by ſeveral expert and judicious workmen in the art of well-ſinking. They had gone to a moſt extraordinary depth ; but in vain. They were of opinion no water was to be found, unleſs they perforated the great abyſs ; and therefore gave up the job. In

In a ſhort time after, ſome labourers were employed to open a ſtone-quarry; and after digging a very ſmall depth, to their great amazement they found an excellent ſpring of water, ſo far perennial that it has never yet been known to fail. We may ſuppoſe our well-diggers had not conſulted Doctor Halley on the origin of ſprings, or their ſurpriſe would have been leſs. For, though the rain eaſily penetrated the light ſoil of the heath; yet trickling horizontally through the earth until it arrived at the ſtone-quarry, it there found a receptacle or baſon capable of retaining it. And the further waſte and percolation of the water being ſtopped, it there formed a ſpring—a certain index of which was a parcel of ruſhes growing upon the ſpot.

It is allowed by all, that under-draining has done wonders in reſpect to improving land; but ſurface-draining would do *more*, were it well executed, viz. as deep. Surface-draining ſhould not be too ſuperficial; though the name ſeems to imply that the drains ſhould be cut only deep enough juſt to let the water off. They muſt be made ſufficiently deep to take

that water from the roots, which otherwiſe lies there, ſtarves the uſeful herb, and perhaps promotes the growth of the noxious weed. In this inſtance under-draining has the advantage of ſurface-draining. By the former method, the drain is cut deep enough to carry the ſoak or underwent away; but were they made as deep in ſurface-draining, it would anſwer the purpoſe, and it would take the water off much quicker; which is certainly an advantage. Though under-drains be conſtructed with the greateſt poſſible care, they are nevertheleſs liable to obſtructions, which cannot be diſcovered without expenſive ſearch; but in ſurface-drains, as they lie open to the eye, any obſtruction may immediately be removed at a very trifling expence, ſcarce worth mentioning: but under-draining properly executed is always the cheapeſt.

Some land ſubject to rot ſheep, I think it beyond the art of man to drain ſufficiently by under-drains to prevent that effect: but, with the exception of flooded land, there are few lands in the kingdom that may not be made ſound by ſurface-draining properly executed.

In

In land ſubject to partial overflowings, ſurface-draining will be found uſeful, as when the water ſubſides, the remains will thereby find a quick vent.

In all the flooded land I have ſeen, any hillock or riſing ground was always the moſt fertile; the reaſon of which I take to be, that thence the water ſpeedily runs off. In holes and low places the greateſt quantity by far of the ſediment and ſlime is depoſited: and this ſediment and ſlime are ſuppoſed to be the very quinteſſence of manure: although we find thoſe parts on which they have been depoſited in the greateſt abundance to be the moſt ſteril in the meadow.

In reſpect to commons; the irregularity in ſtocking, and the want of diviſion-fences, make ſurface-draining exceedingly deſirable. For ditches here might ſerve a double purpoſe, that of fences and drains: they might divide land of different qualities; as it often happens that ſome is fit for paſture, and other parts proper for the plough.

Proper draining may ſave ſome acres in a large field newly incloſed. In an arable field, how

how common is it to ſee, for the ſake of making a fence ſtraight, an acre of land rendered unfit to be ploughed! In one not exceeding ten acres, I have ſeen this prove an abſolute nuiſance; and the occupier had received advantage by leaving it to any other perſon who for the ſake of the land would clear it of the weeds. The farmer manured, ploughed, ſowed, harrowed year after year; but reaped nothing. He had the ſatisfaction of ſeeing it look black in fallow, and green with corn, turnips &c.—Couch-graſs indeed would give a verdure, but no profit: and the miſchief is, that by ploughing in the cuſtomary manner the couch-roots are conveyed through the whole field, and plentifully ſpread by croſs ploughing and harrowing.

When fences are made to incloſe ground, they ſhould always be ſo placed as to be proper for draining. Ditches are an outfall to either ſurface or under-draining: and as it is the cuſtom to make under-drains much deeper than ſurface-drains, the outfall ought to be particularly attended to before either the one or the other is begun; for, if any kind of drain is not

made

made with ſufficient declivity, or the ditch not cut deep enough, the current will be ſtopped, and the drains rendered uſeleſs by the water ſtagnating, or flowing back when the outfall attains a level ſomething above the mouth of the drain.

In very wet ſeaſons under-drains are liable to blow up, unleſs a ſufficient drip or fall is given. Therefore chooſe the loweſt part of your ground to begin your outfall, which, as before obſerved, you will take care to make ſufficiently deep and large to receive any extra quantity of water that can poſſibly fall. From your outfall you will proceed to work upwards with the number of drains neceſſary, always recollecting that the greater the drip or fall, the more rapid the current of water: and you may with very little trouble, by a common level, know to an inch the declivity you can give your drains of any ſort. To be careful in the conſtruction of your drains at firſt, is what I muſt particularly adviſe; as the want of precaution in this inſtance is often attended with a very heavy expence.

Sides

Sides of hills, where there is a natural outfall, are eaſily drained: it may be effectually done, at little expence, by under-draining.—But where the land is nearly flat, much art and management is required. On ſuch land ſurface-draining is certainly preferable: and if it be neceſſary to make your outfall ſo deep as to endanger cattle or ſheep, it may ſerve for a fence. The art of draining is carried to very great perfection in my native county of Lincoln, where the engineers now rival, if they do not excel, the Dutch.

In a flat country ſurface-drains may in very dry ſeaſons be made uſeful, where there is an opportunity of conveying water ſo as to fill them; for in that caſe the ſoil is fed by the water which oozes from them. This method is practiſed in the north marſhes of the county of Lincoln; and a conſtant ſupply of freſh water conveyed, when wanted, by *clows* with gates or doors to keep up the water at proper times above the level of the grips or drains, which of courſe fills them, and feeds the land on each ſide.

There is a kind of boggy land, which cannot be drained by means of ſurface-drains: the ſoil is like batter, and would run ſide to ſide, and cloſe them up in a few days, unleſs lined by ſome hard ſubſtance. But by under-drains it may be drained with eaſe; becauſe there is generally a hard bottom to be found at ſome diſtance from the ſurface; the pulpy part being occaſioned by a ſtrong ſpring at the head of the bog, from which the water continually oozes, and lodges in the porous parts, but does not ſink to any conſiderable depth. Proper draining will render ſuch ground firm and uſeful: but it will be neceſſary to cut ſo deep into the ſolid earth as to prevent the drains from ever overflowing, and the water from running under the boggy part.

Clay-lands are the moſt expenſive to drain. They, like every other ſoil, may have ſprings at a ſmall depth from the ſurface: in that caſe it is proper to make uſe of under-drains; for, as clay is of a cold nature, it cannot be kept too dry. But they will likewiſe require almoſt as many ſurface as under-drains to give them a proper degree of warmth, which they never

can

can attain in their humid ſtate; for clay, from the coherence and compactneſs of of the parts, retains ſo much water as will prevent it for a long time ſoaking into the under-drains. On the other hand, unleſs properly broken, and tempered by manure, it becomes in a dry ſeaſon too rigid, and chokes the plants. This double draining makes it expenſive.

Some practiſe the method of draining land by laying it very high on the ridges, and very low and hollow in the furrows. I by no means approve of this; for, when the land is afterwards laid down for graſs, it is attended with much more difficulty completely to drain it, than if it had been made only a little round upon the ridges. The furrows will retain water and continue ſwampy a long time, and produce ruſhes; and the high ridges muſt be cut through in many places; which creates expence, and waſtes much herbage. It may not be unneceſſary to obſerve, that where the ridges have been raiſed too high, and you wiſh to level the ground, you muſt begin to raiſe a ſmall land in the furrow, and gather it larger and larger by degrees. By ſo doing you will make all

parts

parts of the land uſeful, and may drain with much greater eaſe. If you begin to throw the ridges down, and continue to do that, you will cover all the beſt ſoil with the bad.

When drains are obliged to be made very deep, which can ſeldom happen unleſs where they are the principal, or outfalls, roundiſh pebbles are the beſt materials to fill them up with to prevent accidents. But if ſuch pebbles cannot eaſily be come at, any ſort of ſtones may anſwer the purpoſe; as looſe ſtones, of whatever figure they may be, can never adhere ſo cloſely as to prevent the paſſage of the water. With whatever materials you fill the drain, let it be dug ſquare till within a few inches of the bottom; when you may contract it ſuddenly to a triangular form, like the ridge of a barn-roof inverted. But in all drains made with brick-work or maſonry, the circular form is to be preferred; as angles are ſure to impede the free diſcharge of ſoil, and render the drains liable to be choaked. This circular form may be given in moſt ſoils by a ſpade made in the form of a tool much uſed by joiners, wood-carvers and other artiſans, called a *gouge*, by the

ſhoving of which a good workman will make at the bottom of the drain a ſemicircular concavity, preferable to any other figure for uſe.

Under-drains which run into the principal, or outfall, will be found in general to anſwer the purpoſe, if made from twelve to fourteen inches wide at top. You muſt carefully take off the ſod, dig the neceſſary depth, and laſtly, with your gouge-ſpade make the bottom from four to ſix inches deeper, of a ſemicircular concavity. Leave the drains open, until you ſee that you have got a ſufficient drip for the current of the water: then take the ſod, and lay it graſs-ſide downwards over the top of the narrow part: throw in mould upon the ſod until you have filled up the wide part equal to the ſurface: and if the land is not intended to be ploughed, let the mould which covers the drain be properly pulveriſed, and ſown with graſs-ſeeds, which will make a tough ſod. This I recommend as a good method: it will make the drain laſt for a conſiderable length of time, and be attended with little expence. If the ſod is of ſuch a crumbling nature as to be apt to break to pieces, ſome ſmall bits of elm or any other

other plank (though elm is certainly beſt) will keep the ſod from falling in; and the graſs-roots, when a little grown, will give it a compactneſs, and make the parts of the mould cloſely adhere. I have known land thus treated afterwards ploughed, and anſwer extremely well. This draining is generally called *ſhoulder-draining*. Thouſands of acres in mountainous countries might be improved wonderfully by means of drains, which would anſwer the double purpoſe of taking off the redundant water, or of retaining and diſtributing it in dry ſeaſons.

On the tops of mountains the vapours floating in the atmoſphere are attracted, condenſed by cold, and precipitate in rain, dew, &c. The minute particles of water, by their gravity, eaſily penetrate through beds of ſand and light earth, till they are ſtopped in their deſcent by firmer or more denſe ſtrata, ſuch as beds of clay, ſtone, &c. &c. and collected in the cavities and ſubterraneous caverns which nature has formed for reſervoirs. The water thence iſſues out at the ſides of the mountains; and by means of drains properly cut it may be conveyed in any direction, overflow the meadows if neceſſary

neceſſary, and, before the final diſcharge of the ſuperabundant quantity, refreſh and fertilize the valleys it paſſes through. I witneſſed an inſtance of this in viewing an eſtate near Whitby upon the moors, where numbers of ſprings of moſt beautiful water trickle from nearly the ſummits of the hills into the valleys. Mr. Bakewell would always aſſert that the pureſt water improved land the moſt; but I muſt own he did not convince me that the aſſertion was abſolutely true.

In valuing the eſtate juſt mentioned, an induſtrious old farmer attended me. I found the greateſt part under very bad management: in ſeveral places many acres were rendered uſeleſs by the ſprings from the hills breaking out, and continually ſpreading over the land: the cattle going over the ground trod it ſo that it was like mortar, to the great detriment of the tenants, who complained heavily that their land was *ſpringy* and *ruſhy*. I endeavoured to perſuade them that a remedy was eaſily to be found, and pointed out the method above deſcribed; but I had not the ſatisfaction of making one convert to my opinion. I do not believe one

ſingle

ſingle man placed faith enough in me to riſk putting my advice in practice. My old attendant indeed wiſhed he had been a tenant upon the ſpot; for on the farm where he reſided he was continually thwarted in his attempts at improvement by the gentleman his landlord; or rather by the gentleman's agent, who was a taylor by trade, and could not be ſuppoſed to know much of land, or the methods of managing it to the beſt advantage.

After I had gone over this eſtate, my old attendant requeſted me to view his farm. I complied; and ſaw many valuable improvements he had made by under-draining with ſtone, to convey the water from the hills down to the currents below; but the drains did not entirely meet with my approbation.

I had ſaid to ſome of the tenants, that it might be eaſily proved, "That land not then worth more than 6*s*. per acre, might be made by means of the very water they deemed a nuiſance capable of feeding bullocks in a very little time; and that water, if properly applied, would greatly enhance the value of the eſtate." The old farmer was a little ſtaggered by this

aſſertion

aſſertion of mine; for moſt certainly he had conſiderably improved his farm by taking the water from it by under-draining, and by keeping ſheep; and he thought it muſt be wrong, to throw water upon the ſurface in any caſe where it could be conveyed away by under-drains. He took me to the ſummit of a hill, and ſhewed me a ſtrong ſpring that uſed nearly to deſtroy part of a large meadow of his. To cure this, he had fixed ſeven ſtone troughs, each placed at the end of the other, for his cattle to drink from: and at the end of the troughs he had made an under-drain of ſtone, which reached half a mile. The current was ſo ſtrong it would have turned an overſhot mill. By means of theſe troughs the farmer obtained in the year many loads of dung, depoſited by his cattle in the water when they went to drink.—This dung would otherwiſe have been totally loſt. He had made under-drains for all the reſt of the field, which was a large one. I admired the improvement; and, recollecting Mr. Bakewell's maxim, "that pure water was the beſt to improve land," I examined whether this apparently

parently clear water had left any ſediment.—The lowermoſt trough, being the laſt of the ſeven, was nearly full of the fineſt, richeſt wharp I ever ſaw: it was moſt like the ſoft pulpy matter contained in a crab's ſhell. I took ſome in my hand, and found it as fine as the ground white lead uſed for paint. We then got over a wall into a paſture, where my old friend ſhewed me a valuable land he had made by under-draining in the manner before mentioned. He obſerved to me, that the upper part generally yielded as much hay as could be drove out with a ſcythe; and that when the water was firſt drained from the land, there was little elſe beſides nettles and docks. This was at top, where moſt of the ſediment had lodged. I was convinced that wonderful uſe might be made of the ſprings on the hills, by making a main drain near the ſummits, to form one or more reſervoirs. Such water would improve the whole farm, and be conveyed ſo as to refreſh any of the paſtures or meadows at ſuch times, and in ſuch quantities, as the farmer ſhould approve of. He might always have water at command by under-drains, and a re-

reſervoir

ſervoir. A very ſmall ſluice at the top of the under-drains would ſhut and open, to let the water run, or ſtop it. A little lower down, by way of fence, another reſerv oir might be formed, and by ſuch means improve the whole eſtate. In ſhort, I never ſaw any eſtate ſo eaſily to be improved, or ſo much to be increaſed in value by a trifling expence. But there are thouſands of acres in the ſame ſituation.

In Craven, as well as the North Riding of Yorkſhire, and in Lancaſhire, many eſtates may be improved in the ſame way. I have not yet ſeen this method practiſed there; though ſo many thouſands of acres are nearly ſpoiled by water.

With reſpect to the method of making under-drains, I muſt add, that where neither ſwards nor ſtones are to be had, oſiers laid in them green are good ſubſtitutes, and will laſt an almoſt incredible time, if kept covered from the external air. I have ſeen oſiers taken up ſome years after they had been depoſited in the ground, and the bark was as freſh as if they had been juſt cut. I repented I did not ſet one, to try whether it would grow. Almoſt any thing put in green will

will ſerve the purpoſe of covering drains.—Even ſtraw has been uſed with ſucceſs: but I diſlike that method. In fact, I diſapprove of every thing that prevents ſtraw from being made into manure for the benefit of the farm. It ought always to be returned to the farm, and every grateful farmer will do ſo.

Under-drains are made in an excellent manner with brick-work: but that method has become too expenſive ſince the high duty laid on bricks; except perhaps in the vicinity of large towns, where land bears an extravagant price; or in pleaſure grounds, where money is not laid out with a view to profit. Drains of all ſorts muſt, as before hinted, be cut in proportion to the quantity of water they are meant to take off.

Wet ſand is the moſt difficult to drain by open or ſurface-draining of any land whatever; as the ſand is continually running in and choking the drain. There is no way to manage it, but by under-drains: and then the ſides muſt be ſupported by ſomething ſolid, ſuch as ſtone, brick, plank, &c. Bricks or tiles made with holes in them, like thoſe put on the ridge

of a houſe, are the moſt proper in wet ſandy ſoils.

SECTION LII.

Opinion on Lime: what Land it is proper to be laid on: the good and evil Conſequences attending its Uſe.

BY laying plenty of lime on a moor ſoil, it has been found by experience to form an artificial clay. This has been proved on a large tract in the Yorkſhire levels, to the great profit of thoſe who have made the experiment; for there are ſcarce any lands in the kingdom which yield more abundant crops at ſuch ſmall expence. When once this kind of earth gets by means of lime into a ſolid ſtate, the manure afterwards made upon the land by proper application nouriſhes and improves it; and like a ſum of money once accumulated, produces a profitable intereſt.

It is an eaſy matter to prove the advantage of laying clay in preference to lime on light ſand. By dreſſing half a rood of ſuch land with

with clay and manure, and another half rood of the ſame field with lime and manure, you will find a great difference in the crop. *Clay* will enrich a ſandy ſoil; as *ſand* in like manner will ameliorate a *ſtiff clay:* by being blended together, the rigidity of the clay is overcome, and the maſs is rendered fertile. In ſome lands where the ſtrata of earth are thin (as in Nottingham foreſt) I have obſerved a light body of ſand covering a bed of clay. By ploughing ſufficiently deep, the two bodies are intimately mixed and connected, and form a moſt excellent ſoil with little labour.

I do not mean to ſay, that lime may not be uſed to advantage where the ſoil is very ſandy, or mixed with gravel. But on a loam or clay, lime is often pernicious in ſome degree, as it will bind the ſoil like a rock, and effectually prevent vegetation. For plaſtering walls, the workmen uſe for the firſt and moſt ſolid coat a mixture of lime and loam. A ſpoonful of lime made of the gypſum ſo common in Derbyſhire and Lincolnſhire will convert half a pint of water to a ſolid maſs; which is ſurely proof enough of the binding quality it is poſſeſſed of.

In

In ſhort, what is the hardeſt mortar, that will endure for ages, but a compoſition of lime and ſand tempered with water?

No one ever ſuppoſed lime capable of affording nutriment towards the ſupport of vegetation. I had a ſtrong proof of the ill effects of a profuſion of it. I entered into a ſward cloſe, which had been in graſs nine years. One corner of the cloſe was overrun with couch-graſs. I ploughed the whole field up, and ſowed it with oats: but not an oat grew upon the part where the couch had been. Next year the field was ſown with peas: not a ſingle pea grew upon that ſpot! I had obſerved that a heap of lime had been depoſited in the corner now ſpoken of: but it did not ſtrike me that lime was ſo great an enemy to vegetation. After the peas were off, the field was ploughed three times for a crop of wheat; and I ſet a man with a fork carefully to pick out every bit of twitch from the corner, and beſtowed ſomething more of manure upon it than upon any other part of the field. The reſt of the field yielded a moſt abundant crop: but ſtill upon the unfortunate ſpot I could not get a ſingle

grain

grain! Next year it was ſown with oats: not a grain on it! although the other part of the field was covered regularly ſix feet high, and ſo remarkably thick that no animal had offered to make a track through it. Next wheat, again fallowed and manured. An excellent crop which I ſold for ten guineas per acre, excluſive of the expences of harveſting, thraſhing, &c. I was allowed to retain the ſtraw and chaff for my own uſe: yet, notwithſtanding all the pains taken, not a ſingle grain grew on the ſpot in the corner. From the above experiment I infer, that, had the whole field been limed equally with the ſpot I have mentioned, it would have all been equally barren.

I know a piece of rich land (which at this time lets at 3*l.* 10*s.* per acre) ploughed out of old ſward which had not been taken up before in the memory of man: it was ſown with oats, next *limed*, and immediately after liming, ſown with *turnips*. As this land was ſo rich and freſh, I was ſanguine in my hope of a luxuriant and ſpeedy crop; but, the plants not thriving according to my expectation, a kind of anxious curioſity was excited in my mind that occaſioned

caſioned me almoſt daily to examine them minutely. I obſerved them to grow as they would have done upon a poor *lime-ſtone ſoil:* they were nipped up, with the leaves round and ſhort, But, although the lime appeared to have ſhut the door on vegetation, yet, the ſeaſon being remarkably mild, and wet, and of courſe favourable to turnips, the plants grew ſtrong, and from the great fertility of the ſoil, a good crop was produced; but the lime ſtopped their progreſs for ſome time.

But were the lime laid in winter on land when ſown with wheat; by lying upon the top it would prevent the froſt from penetrating to the roots of the wheat, hinder the growth of weeds, and become in a proper ſtate to be intimately mixed with the ſoil for turnips. I am of opinion, almoſt any kind of earth or lime laid on as above in winter will add a freſhneſs, or rather coolneſs, ſo as to make the young tender turnip-plant continue its growth. But you muſt take care not to lay on too large a quantity upon ſome ſoils.

Another miſchievous effect of lime I experienced on the farm at Claythorpe, belonging to Mr.

Mr. Vyner. I had ploughed up a rich piece of paſture, and got a crop of oats, turnips, barley, and wheat. As Mr. Vyner had plenty of ſtone-lime in the next pariſh, I was induced to fetch ſome, and lay it croſs the land intended for wheat, in two directions: but, as long as I remained upon the farm, every crop was lighter upon the two parts limed than upon any other.

From the above experiments this inference may fairly be drawn reſpecting the uſe of lime: that it is chiefly favourable to a light ſand, or mixed gravel, and to peat earth, moor, &c.

SECTION LIII.

On Compoſts. Opinion on the different Sorts.

THE beſt compoſts are thoſe which are made of ſeveral ſorts of ſoil, or earthy matter well blended or worked together, and mixed with manure, to mend and improve impoveriſhed or worn-out lands, and to aſſiſt them in the taſk of vegetation.

Compoſts

Compoſts are of ſeveral kinds, and they ſhould differ according to the different nature or quality of the ſoils which they are deſigned to meliorate, and according as the land is either light, ſandy, looſe, heavy, clayey or cloddy. A light looſe land requires a heavy compoſt, as clay, the ſcouring of ditches, ponds, drains, &c. On the contrary, a land that is heavy, clayey, or cloddy, requires a compoſt of a more ſprightly and fiery nature, that will inſinuate itſelf into and penetrate the lumpiſh clods, which, if they are not thus managed and broken, would very much impede the work of vegetation.

I will now give an opinion of the different compoſts moſt generally in uſe: but it is neceſſary to obſerve once for all, that great care ſhould be taken that the different materials of which the compoſts are made be well mixed or worked up together; that there be not too great a quantity of any one ſort to overpower and counteract the other; but that the whole be blended into one maſs in a due proportion.

The beſt compoſts are thoſe which ferment the quickeſt, and are generally mixed with ma-

nure.

nure. Though we call all dreſſing by the name of manure, we know there are various kinds, the choice of which for particular lands and purpoſes ſhews the ſkill of the huſbandman. Bones, dung, chalk, lime, marl, clay, ſand, bark, weeds, aſhes, rotten-wood, ſaw-duſt, ſhells, kelp or ſea-weed, woolen rags, and an infinite number of other things, are excellent manure when uſed with judgment; but will prove as detrimental to one ſort of ſoil as they may be beneficial when properly applied to another.

Bones are good ingredients in compoſts. They are frequently made up with coal-aſhes, or more properly cinders, which in my opinion is highly improper. Bones are naturally dry, except when broken very green, ſoon after the death of the animal they made a part of; in which caſe the moiſture of the marrow is left to cauſe a fermentation for a ſhort time: but thoſe which have undergone a long boiling to extract every particle of oil, differ conſiderably in richneſs from the green and juicy. Therefore, inſtead of adding ſo powerful a drier as coal-aſhes or cinders, which muſt counteract

the effect intended, ſomething moiſt ſhould be applied to form a compoſt and promote fermentation. I am of opinion, that, were bone-manure thrown into the reſervoir in the fold-yard, and well mixed with earth, ſtubble, or any ſuch refuſe, the bones would abſorb the rich juices, and recover the virtue they had been deprived of by boiling. This method ſeems more rational to me, than forming a compoſt of dry bones, dry aſhes or cinders, poor ramel, or dead earth, ſuch as is generally uſed for the purpoſe. For, of all the compoſts I have yet tried, I have invariably found that the more hearty the materials uſed, the better has been the compoſt, the greater the benefit the land has received, and of courſe the more abundant the crop. Beſides, the above treatment would prevent the dogs, crows, &c. from carrying the bones off the land.

I have tried the effects of a compoſt tempered with bone-manure on different ſoils, and found it proſper beſt on a moiſt ſoil. I laid ſome compoſt of this kind on a piece of land that had been ploughed and ſown with corn for ſome years, and which I had never known produce

duce the ſeed again. This piece was a pan, or hollow, in the middle of a ploughed field, which had never been drained. I followed my predeceſſor's method for three years, did exactly like him, ploughed, ſowed, &c.—but reaped nothing! Tired of this fruitleſs expence, I ſet about draining the field, and manured the whole with bone-compoſt; and the ſpot which until then had been ſo very unprofitable bore a better crop than any other. One part of the field lay high and dry, and always uſed to bear the beſt crop, but the bone-compoſt had no great effect on this dry part; for it was by far the leaſt productive according to its quality. The bones were mixed, according to the uſual method, with coal-aſhes, and ſpread equally over the whole field—a convincing proof that compoſt ſo made is not proper for dry land.

I laſt year had a quantity of bones broken and mixed with good earth, and laid it on a piece of moiſt land. A very good crop enſued. I made ſome experiments two years ſince on a piece of graſs-land, with a compoſt made of bones and coal-aſhes without any other mixture

ture whatever. This was thrown on at the rate of ſixty buſhels per acre. On another part of the ſame cloſe nothing but coal-aſhes were ſtrewed; on another, manure or wharp out of a pond; and on another, ſome ſtuff collected from a fold-yard, pig-fold, &c. From the above different dreſſings there appeared great difference: the coal-aſhes were by far the beſt; the ſtuff from the fold-yard, pigfold, &c. was the ſecond beſt; the bones and aſhes were third; and the wharp from the pond, the worſt of all. The above manures were all of them of little ſervice the firſt year: but the ſecond year they produced a very great crop, the beſt and longeſt natural graſs I ever ſaw. The bents were continued heads four feet high, and the under-graſs was at leaſt three feet, but not quite ſo thick ſet at bottom as I expected. The dreſſing having been laid on thick, and a very great flood coming ſoon after, the crop was rather thin the firſt year. The aſhes this third year ſtill keep the lead, as does the ſtuff from the fold-yard the ſecond place. Laſt year the eddiſh was ſhort all over the field, owing to the graſs ſtanding too long before it

was

was cut, as the ſeaſon had proved ſo rainy. Letting graſs ſtand over long without mowing is certain to impoveriſh the enſuing eddiſh.

I ſaw an experiment tried on a meadow. Every other land had been manured with horſe-dung compoſt, and with bone-compoſt, alternately: this had been done ſix years. The meadow was regularly mown every year: the eddiſh was on the land when I ſaw it; and where the bone-compoſt had been laid, the crop had been, for the laſt two years, by far the moſt abundant, and the after-graſs was moſt luxuriant. The ſoil is a poor cold clay: and for ſuch ſoil bones are the moſt nouriſhing of any thing, except coal-aſhes.

My own land, on which I tried the experiments before mentioned, was a poor wharp, and was in ſome parts wet and poachy, and in others very dry: the compoſt was laid acroſs the land, which was ridge and furrow. The manure taken out of the pond was found to anſwer beſt upon the ridges—an additional proof of that kind of dreſſing not being proper for wet cold ſoils. But it will ſuit gravel, ſand, or any light dry ſoil—All the bones I made

made uſe of were horſe-bones, not boiled, but freſh, and of courſe abounding with oil, which cauſed a ſtrong fermentation. I laid per acre ſeventy buſhels of theſe bones mixed to a compoſt of four cart-loads per acre.

Every family ſhould have a particular place ſet apart to receive bones, as it is a pity to waſte ſuch good and profitable manure. Every bone which goes from the table ſhould be collected in ſuch receptacle: fiſh-bones moſt particularly; for I am of opinion they are preferable to any. Bones are ſold at various prices in different places. For the purpoſe of breaking them, the power of the thraſhing-machine, heretofore mentioned, might be applied to turn two rollers with teeth—If no horſe-machine can be procured, it is very eaſy to erect an engine ſomething ſimilar to that uſed for driving piles for the foundations of bridges, buildings, &c. which may be worked by men; or it may be contrived, by means of a roller or windlaſs turned by a winch, to be worked by a ſingle man; the rope being threaded through a pair of blocks or pulleys, and the rammer diſcharging itſelf when at a proper height

height. There is ſcarce any millwright but knows how to erect ſuch machines at a ſmall expence, without my giving a deſcription of what is very common. But if you are in want of means to employ your men in bad weather, there is a more ſimple method ſtill, by faſtening blocks or pulleys to a ſtrong beam, and by main force drawing up a heavy weight, which you ſuddenly let fall upon the bones to cruſh them. This would be pretty play, as diverting as bell-ringing; and it requires no ſcience in the performers. Six-pence per buſhel is given to the breaker: the poor people might do it by a hammer.

Fiſh-blubber is another very good material for a compoſt. It ſhould be mixed up with good earth, and put in the middle, in the ſame manner as you put an apple and encruſt it with dough to make a dumpling. When the blubber has done heating, turn it over upon good earth, cover it in the ſame manner as before; and let it lie in that ſtate until near the time it is wanted. The compoſt ſhould then be turned over again, as it cannot be too well mixed and blended together. Some uſe

refuſe

refuſe of ſoap-boilers: but I am not very fond of compoſts ſo made, and give the preference to the two above mentioned.

Soot, pigeons-dung, and rape-duſt are all hand-manures; but are better made into compoſts and applied in drill huſbandry (as recommended in this Work) than uſed ſingly.

I had laſt ſummer the fineſt garden-cabbages and early peas any where to be found, all growing by compoſt made in the moſt ſimple manner. The cabbages were univerſally allowed the beſt and forwardeſt of any that had been ſeen that ſeaſon in the Doncaſter gardens, which are by far ſuperior in reſpect to ſoil. This I attributed to management; for the natural goodneſs of ſome of thoſe garden ſoils certainly equals the compoſt I uſed in my drills.

My compoſt was made from the ſhovelings-up of the fold-yard. I had the manure carried out when the weather was dry; and, when rain came on, I ſet the men to coul and ſhovel every part of the bottom of the fold, and likewiſe every part where I thought any thing uſeful might be found. Amongſt other things, there

there might be one cart-load of human excrement from the neceſſary. I had a feeding paſture, which in one corner produced nothing but nettles, docks, and other uſeleſs weeds: the compoſt was piled up in a heap on that ſpot. I ordered the men to dig round, and ſod it about twelve inches thick round the ſides and top, ſo as to incloſe the inſide materials with a perfect cruſt. The manure thus incloſed, being moiſt and rich, fermented very much for about fourteen days. When I perceived that the fermentation was checked, and the heap grew cool, I ordered it to be removed to a place where I had prepared about ten loads of manure made by pigs, horſes, &c. during the time the firſt heap had been fermenting. The laſt-mentioned manure had been made by horſes and cows from green fodder and wheat-ſtraw chopped, as before recommended, and by pigs in the fold where the manure was laid. There had been ſome couch-graſs roots laid for about three years with ſome ſoil in them of a poor nature: theſe amounted to ſeveral loads, and we incruſted the freſh manure with the firſt-mentioned compoſt, in the ſame manner

as deſcribed in the firſt inſtance, or, as I ſaid above, like an apple in a dumpling. Some rain fell ſhortly after, which cauſed a ſecond fermentation, and a very ſtrong one. I ſuffered it to ferment until ſcarce any ſmoke or vapour could be perceived to ariſe. I then ordered it to be turned over, and mixed the couch-graſs roots and all together. I found the hill of compoſt very rich: if I had not known there had been ſuch a quantity of earth in the compoſition, I ſhould never have given credit to any one who had aſſerted the compoſt to have been made with ſo ſmall a quantity of what is termed manure.

I had fixed my plan for ſetting the cabbage-plants, and intended this compoſt only for them, and for one acre of forward peas. As I knew my quantity of manure did not exceed twenty loads at firſt; that the laſt ten loads added, if fairly rotted down, could not be eſtimated at more than five loads; and that the firſt manure, by being ſhoveled, muſt have accumulated ſome ſmall portion of earth; I was ſurpriſed, when the hill was turned over, to find near fourſcore cart-loads of compoſt by meaſure-

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ment—a proportion of upwards of three loads of ſoil to one of manure. I began to fear I had been too liberal of earth, and too ſparing of manure, and that my cabbages would ſuffer for it. The land I intended to plant them upon being poor ſoil, and having had a crop of potatoes, a crop of wheat, and then a crop of oats, I was very certain that without aſſiſtance it would not bring a cabbage to perfection, eſpecially in winter. Therefore I knew all muſt depend upon the compoſt.

As ſoon as the oats were mown, I had them moved from the land, and half an acre ploughed two days after. The half acre was then harrowed, and the rubbiſh raked off: it was then ploughed a ſecond time, harrowed and raked, and the rubbiſh carried off. Drills were made for eight rows. I then put in the compoſt, and covered it up with ſoil. In each drill I ſet four hundred plants. The weather being very dry, I did not much like my proſpect; as I thought the compoſt would loſe its virtue. At this time, my plants in the ſeed-bed being forward, they wanted thinning very much, and every thing appeared to be going wrong. In a week after, however,

however, there was a fall of rain ; the cabbages ſet, took root, and grew ſurpriſingly well : but to my great mortification oats came up thicker by four to one than ever they were ſown. And what was ſtill more aſtoniſhing, the oats which then made their appearance were Tartarian oats, a ſort which do not ſhell half ſo much as ſome other kinds. I could not, when my oats were mown, perceive the ſmalleſt loſs, nor were they over-ripe. This circumſtance made me ruminate upon the great loſs there muſt be ſuſtained when oats appear, as is frequently the caſe, thicker on the land after cutting than when they firſt come up after ſowing. When we ſow oats, the land is ſeldom ſufficiently pulveriſed to receive the ſeed in a proper manner : conſequently, there muſt be more ſown than neceſſary if it were depoſited as it ought to be, ſo that every ſeed that is ſown ſhould vegetate. This land having been ſown, when in wheat, with rye-graſs, was ten times thicker with rye-graſs than with oats : on the whole, that part was a complete ſward. This land having ſuch numbers of different plants to feed, I feared my cabbages would thrive but poorly : but they did

did not receive the leaſt injury. The land was hoed as ſoon as the cabbages would admit.

Through the whole of this Work I have repeatedly endeavoured to convince the farmer, that with proper management he need not be under the neceſſity of buying manure; for every farm will raiſe fully ſufficient of itſelf.—As an additional proof, I will now enumerate the different crops raiſed by the aſſiſtance of the twenty loads of dung before mentioned, and will likewiſe ſet down the number of acres. The reader will recollect that the twenty loads of dung were manufactured, including the addition of the horſe, cow, and pig dung (which I eſtimate when rotten at five loads) into eighty loads of compoſt.

Firſt, half an acre of cabbages	16 loads
Second, half ditto ditto	12
Third, half ditto ditto	8
	36 loads

Finding ſo much of the compoſt left on hand, and being alſo in poſſeſſion of more manure than could poſſibly be wanting for my rotation

of

of other crops, I determined to try a new experiment on ſix acres, which were intended for oats the next ſeaſon, and which had that year produced wheat. I cleared the wheat ſtubble, and made a complete fallow of the ſix acres. I laid on them thirty-ſix loads of my compoſt, and ſowed them again with wheat; for I always was of opinion that land would bear good crops of wheat for ſucceſſive years, if well manured, and kept clean of weeds and rubbiſh.—A good crop was produced where this compoſt was laid. This ſort of cropping, however, I much diſapprove of, except for experiment's ſake. One acre of early peas had of this compoſt ſix loads; and one half acre of pearl peas three loads. The account will then ſtand as follows:

Loads of compoſt to cabbages	36
Ditto of ditto to wheat	36
Ditto of ditto to peas	9
Total loads	81

So that there was a difference of only one load between my eſtimate by admeaſurement, and the

the loads actually carted of it for uſe upon nine acres of land. Upon three of theſe acres, ſo drilled and managed, there was a moſt abundant crop. I do believe, that in the whole kingdom there were not to be found on the ſame quantity of land ſo great a number of cabbages equal in weight, and ſo ſoon ready to cut; nor of peas that yielded ſuch great meaſure, and that came to perfection ſo early. This fertility is greatly to be attributed to the uſe of my compoſt, and is ſufficient, one would imagine, to ſtimulate the intelligent and enterpriſing farmer to follow my method in collecting materials for making a compoſt ſo ſimple and valuable, and not to ſuffer in future (as now is the caſe) the manure to lie until by exhalation it is deprived of the fineſt parts, and drained of the beſt juices, to the loſs of more than half the value.

It may be objected by ſome who are bigoted to old cuſtoms, and enemies to all improvements, "that every man has not a ſoil rich enough to mix with manure in order to form the compoſt above mentioned." Such a caſe can ſeldom happen: but we will ſuppoſe it.—

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The farmer then, who has no other than very poor ſoil, ſhould let the bottom of the fold-yard be covered with it, ſo that the juices of all the dung and muck may drain into the mould: and he will find, when he comes to work this ſame mould up in the manner before deſcribed, that he will have a good compoſt, and in as great plenty as the farm may require.

I am of opinion that, where the land is deſigned for turnips, ſix loads of ſuch compoſt put in the drills as before mentioned, would produce as good a crop as double that quantity of dung made uſe of according to the old method.

My gardener dug up ſome narrow graſs-plats, wheeled them on a heap, and mixed a ſmall part of manure with them for the uſe of the garden. I obſerved there was at leaſt four times as much of the ſward as of the dung. I took particular notice of his crops the next ſeaſon, and found them better and more regular than when he uſed manure alone.

The frequent turning of manure prevents the effect intended; as it deſtroys fermentation. Manure ought never to be turned, except for

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the purpoſe of mixing it with other ingredients to form a compoſt. The incruſting ſtrong manure in the manner before directed, with a layer of mould at the bottom, by way of undercruſt, to receive the moiſture that muſt inevitably drain from it, is the beſt method I know of to prevent unneceſſary exhalation, to increaſe fermentation, and to render a compoſt ſpeedily fit for uſe.

I have made repeated trials of lime in ſeveral compoſts, but I never found it add to the burthen of the produce. On the contrary, I have the ſtrongeſt reaſons to ſuppoſe that lime has been the occaſion of conſiderable failures, where from every circumſtance the crop might have been expected to turn out abundant. As compoſts are to ſupply the place of manure, lime ſhould not be added in great quantities as an ingredient; for lime is of a binding nature, and adds weight to light ſoils. But in the drill-huſbandry, compoſts made as here directed will be found much preferable. By putting the compoſt in a drill ſix inches wide at the top, and perhaps four inches at the bottom, and allowing thirty-two loads to one acre, the

compoſt being folded up in the manner deſcribed, the plants, though ſtanding in a poor field, have a rich ſoil to feed on and grow in, like a fat horſe in a poor paſture, but plentifully fed with corn.

The different things uſed in agriculture under the general name of *manure*, differ eſſentially in their nature, and almoſt as much as to the proper time for uſing them. For inſtance: if, to make bone-manure, the bones of a horſe be ground within one month after his death, and then the bones of another which has been dead *twelve years*—(this I have known to be the caſe) can any one ſuppoſe the old dry bones capable of rendering the ſame ſervice as thoſe which are green, and conſequently replete with oil? Or can bones which have been boiled for the expreſs purpoſe of extracting all the oil be equally uſeful with thoſe which abound in juices? May not this difference in reſpect to the ſtate of the bones be often the cauſe of the difference in opinion concerning their uſe? One farmer will extol the uſe of bones, another will depreciate them ſo far as to ſay they are good

for

for nothing. This compariſon will hold good in reſpect to the compoſt I have recommended. The manure muſt be full of ſap and juices, and of a ſtrong quality, and worked up in a proper time, ſo as not to loſe the virtue poſſeſſed; or it will be as ineffectual as dry bones broken. Any man who underſtands brewing will comprehend what is meant by evaporation and exhalation, and will tell you that either may be carried ſo far as to diſcharge all humidity, and leave only a dry and almoſt uſeleſs lump behind.

Lime differs ſo much in quality, that I will not pretend to ſay it can never be mixed to advantage in any compoſt: but I can ſay that I never found it anſwer. There is one general rule, however, that I recommend to the farmer: if he can by attention and art procure manure upon his own farm, not to ſpend both his money and time in ſeeking it far from home. If the value of ſtraw, when eaten by cattle, and the dung made into compoſt, were conſidered, it would be nearly as dear as hay. He who ſells the whole of the produce from his farm, is as fooliſh as the boy in the fable who killed his

gooſe

gooſe to get the golden eggs at once. *Great goings-out muſt have great comings-in.* This is an old adage, well underſtood: and if the farmer does not repleniſh with manure, he will ſoon find his land decreaſe in produce.

SECTION LIV.

Opinion on Water-Meadows, founded on Experiments. Nouriſhing Manure left by the Sediment.

IMPROVING, by means of water, ſuch land as by nature is formed to receive that benefit, is a good and cheap method. But, when land lies a little above the level of the water, or, being of an uneven ſurface, part hillocks, part holes, muſt be levelled by the ſpade, or even by the plough, it will frequently be found not only expenſive but detrimental. For, in levelling, the hillocks are robbed of the beſt ſoil, a ſuperfluity of which is thrown in to fill the holes: and it muſt require a conſiderable length of time before the water can depoſit a ſufficient quantity of ſediment to be diſtributed

diſtributed equally, and of a proper thickneſs, over all the land, ſo as to afford nutriment to uſeful plants upon thoſe ſpots which from their elevation had been left barren. I think the method I mentioned before, under the head Surface and Under-Draining, Section LI. p. 12, much more likely to anſwer the purpoſe, provided you have a ſpring or reſervoir on a neighbouring hill. By means of drains properly managed, you may convey water when and where you will. Some meadows are more ſuſceptible of improvement by theſe means than by any other: and your compoſt may be uſed to more advantage elſewhere than on them; for, if they are liable to be overflowed, the manure is frequently carried away and loſt; or a very heavy rain, by coming down in torrents from the hills, may occaſion the ſame miſchief. Regularly and gently watering by means of drains has none of the above inconveniences, as what ſediment is left clings to the roots of the graſs like glue, and cannot be eaſily removed. It does not require a great weight of water to nouriſh meadows, but a conſtant and eaſy ſucceſſion.

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The firſt water-meadow I ſaw was at Diſhley, at the late Mr. Bakewell's. The operation was performed on a very poor piece of land, which had been nearly overgrown with ruſhes. Mr. Bakewell told me the ruſhes had been killed by the water: but I am apt to think their extermination ſhould be attributed to the frequent cutting them, and letting in the water; for, being ſo full of pith, they would contain a great quantity of water; and, the froſt coming upon them in that condition, they muſt inevitably periſh. To cut ruſhes is one means of deſtroying them, if done late in the ſeaſon, ſo as to leave the pith open in the winter. Cattle were feeding, in the ſummer, on the graſs of this water-meadow, to the great profit of the owner. They were very fat, and were the firſt I had ever ſeen ſtall-fed in ſummer.

All land intended to be converted into water-meadow ſhould be particularly well underdrained before any water is let on it; as the under-drains will be of infinite uſe, acting like a ſtrainer, by drawing the ſuperfluous water from the ſurface, and leaving the ſediment behind. This, ſurface or top-drains would not do effectually. When

When I returned from Diſhley, I tried this improvement upon ſome land of my own; but found that the quantity of water I was maſter of was inſufficient, and that it was better applied in the fold-yard, where it was received in a reſervoir for the purpoſe of forming a compoſt, as already mentioned.

Upon the whole, artificial watering of meadows is a moſt excellent improvement: it robs no dunghill, but raiſes one for the benefit of other lands. For, if a farmer can water ten acres of land, cut the graſs and uſe it either in ſtall or fold-feeding, he might keep perhaps forty beaſts; and, by working the manure made by them into a compoſt, and applying that compoſt to other lands, he might either have a great deal more hay for the winter, or feed more cattle in the ſummer.

SECTION

SECTION LV.

On Pigeons, and the beſt Method of treating them.

DOVECOTS ought to be built ſo ſpacious that the pigeons may with eaſe and comfort to themſelves fly about within them, and that, if any thing alarm them from without, they may readily eſcape. If a dovecot be high, and narrow within, pigeons will diſlike going to the bottom: I have known, when young pigeons have tumbled out of the neſt, that the old ones have ſuffered them to ſtarve rather than go to the bottom to feed them. I had a ſummer-houſe in my garden, which I converted into a dovecot. For ſake of ornament, I raiſed my new building a conſiderable height: but the inſide was narrow like a well. The young pigeons frequently fell on the floor, ſome of which were found dead with empty craws, others picked up alive, but half ſtarved. No pigeons ever laid their eggs in the bottom holes; nor would even the young rooſt in them. We had a great number in the winter, becauſe we fed them well; but many flew away

away in ſummer. I put in a floor about half way down, and they proſpered much better.

A man, who beſides exerciſing other trades went about the country to kill rats, and had been employed in that capacity by an uncle of mine, was engaged by a neighbouring gentleman to repair ſome neſts in his dovecot—the largeſt and beſt I ever ſaw. Having a ſtrong inclination to build a cot and raiſe a ſtock of pigeons, and hearing of this famous dovecot, I went with the rat-catcher to view it. The neſts were all made of ſmall wickers, like baſket-work. Though this was quite a new method to me, I could very eaſily conceive it was the beſt I had ſeen: the pigeon in a wild ſtate makes her neſt ſo; and he will not err much who obſerves and takes nature for his guide. However, as this method was expenſive, I varied from the plan, and made mine of clay and laths. I did not incloſe it in front, becauſe I then thought (what I am now convinced is true) that pigeons like to be more at liberty than the common form of dovecots allows. The one I examined was in the middle of a town, and in the centre of the moſt popu-

lous ſtreet. I was amazed the number of people almoſt continually near the place did not diſturb the pigeons ſo much as to make them forſake their habitation, eſpecially as a blackſmith's ſhop was ſituated cloſe to it: but my guide, the ratcatcher, told me that pigeons delighted in noiſe and company, and that, if they left the cot, he knew how to fetch them back again. I thought he dealt a little too much in the wonderful. He adviſed me not to ſtock the dovecot until the latter end of the year with the harveſt flight; as pigeons bred at that time are the ſtouteſt for the winter. I followed his advice, and in the proper ſeaſon coloniſed it with four dozen of pigeons, and kept them incloſed for ſome time; but when they were let out, they all flew away in a few days. One or two would ſometimes come about the cot, but I deſpaired of ever making them fond enough of their habitation to breed in it.

Recollecting however the aſſertion of the pigeon-conjurer, I ſent for him, and he paid me a viſit the next day. He began by filling a large pot with water, and immediately threw ſome ingredients which he took from his pock-

et into the water; ſet the whole on the fire to boil, and kept ſtirring the ingredients about until they were entirely diſſolved. He went with this mixture into the dove-cot, and took great pains to lay it on with a painter's bruſh both in and outſide the holes. He then got a ladder, and in the ſame manner waſhed over the loover, or aperture where the pigeons enter, with the ſame mixture. In ſpite of the aſſurances given me by the operator that my pigeons would return, and perhaps with additional company, I did not place implicit faith in his predictions, and could not avoid expreſſing ſome doubts of the attracting power of his noſtrum. But he conſented to ſtop until the next day, when the pigeons were to make their appearance; upon the terms, "No pigeons, no pay" About eleven o'clock a ſingle pigeon came, and about three the ſame day all my emigrants returned. My ſtock ſoon grew numerous, and they never after forſook the cot. A moſt extraordinary good one it ſoon proved, with the aſſiſtance of a colony of ſtrangers, who had been enticed to take up their reſidence by the faſcinating accommodations provided by my rat-catcher. I could

I could not prevail upon the man to diſcloſe his ſecret, or I would here give the recipe for the public good: but the principal ingredients were undoubtedly ſalt and aſa-fœtida. However, as he had convinced me of his ſkill in pigeons, I liſtened carefully to his inſtructions concerning the management of them. He adviſed me never to go into a dove-cot later than mid-day, but as early in a morning as convenient. Whatever repairs are neceſſary, either to the building or to the neſts, ſhould be done before noon: for, if you diſturb the pigeons in the afternoon, they will not reſt contentedly the whole night; and the greateſt part perhaps will not enter the cot until the next day, but will ſit moping on the ground; and if in breeding-time, either a number of eggs may be ſpoiled, or ſeveral young ones ſtarved to death.—He likewiſe cautioned me againſt letting the firſt flight fly to increaſe my ſtock, but to take every one of them; as theſe will come in what is called *Benting-time*, that is, between ſeed time and harveſt. It is then that pigeons are the ſcarceſt of food; and many of the young would pine to death through weakneſs during that ſeaſon.

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It is neceſſary to give food to pigeons during the Benting-ſeaſon only: but it ſhould be done by three or four o'clock in the morning; for they riſe early. If you ſerve them much later, they will keep hovering about home, and be prevented taking their neceſſary exerciſe. If you feed them the year round, they will not breed near ſo well as if forced to ſeek their own food; for they pick up in the fields what is pleaſant and healthy to them, and from the beginning of harveſt to the end of ſeed-time they find plenty.

At the latter end of every flight be careful to deſtroy all thoſe eggs which were not laid in proper time. The proper time for the ſpring-flight is in April and May. After the harveſt-flight, cold weather begins to come on, which injures the old pigeon much if ſhe fits late; and the young will be good for nothing, if hatched. A warm ſituation ſuits pigeons the beſt.

It is very neceſſary to pay attention to cleanlineſs in the management of a dove-cot. Before breeding-time the holes ought to be carefully examined and cleaned; for if any of the young die in the holes in ſummer, maggots are ſoon bred

bred in them: they become putrid, and emit a diſagreeable and unwholeſome ſtench, very injurious to the inhabitants of the dove-cot.—Pigeons are tenacious of their neſts, as appears from the conduct of the wood-pigeon, which will breed for years in the ſame tree, and the mother forſakes hers with regret: but, unable to endure the filth and ſtench of her dead offſpring, ſhe is obliged to quit the eggs ſhe has laid for a ſecond brood; and the prime of the ſeaſon is loſt. Every ſummer, immediately after the firſt flight, the neſts ſhould be all cleaned out, and the dung totally taken away, as it breeds filth. But remember to do this buſineſs early in the morning. You ought likewiſe to deſtroy the remaining eggs, and make a perfectly clean habitation for the harveſt flight.

Pigeons are profitable and uſeful. Although they be ſuppoſed to do much miſchief in ſeed-time and harveſt, I contend that the farmer is a gainer by them, and repeat my aſſertion that they are both profitable and uſeful. They make an extraordinarily good manure, which, if worked up into a compoſt, inſtead of being uſed in the preſent ſlovenly way, would be of ſtill more

value

value. Pigeons, like many other animals, are more productive from the breeds being croſſed. I put a few tame pigeons into a dove-cot; and the conſequence was, that I had a more early and a more numerous hatch of young than any of my neighbours.

In general, a dove-cot has treble the number of holes that are uſed. I took off the roof from one of mine, and put a new one on without doing any injury to my pigeons: but I did not ſuffer the workmen to work after twelve o'clock at noon. It was a very low cot, but wide, with few holes in it. I have had ſix dozen of pigeons in a morning from it. Many of them bred on the floor: an old table ſtood in the middle of the cot, and ſeveral had made neſts and bred upon it; which makes me think it not neceſſary to incloſe the holes in the manner ſo generally practiſed.

It is erroneous to ſuppoſe ſtarlings deſtroy pigeons' eggs, or injure a dove-cot: they only take up room. Pigeons have a great antipathy to owls, which find their way ſometimes into dove-cots; and there is no getting rid of ſo troubleſome a gueſt but by deſtroying him.—

Rats,

Rats are terrible enemies to pigeons, and will ſoon deſtroy a whole dove-cot. Cats, weaſels, and ſquirrels will do the ſame. It will be neceſſary, therefore, to examine the dove-cot once every week at leaſt very minutely.

SECTION LVI.

Deſcription of the neceſſary Utenſils in Huſbandry for clearing Land, &c.

IN the firſt Section I deſcribed the method of fallowing land, the uſe of the plough, harrows, drag, a roller and couch-rake. Having ſeen many different inſtruments employed for the purpoſe of clearing land, I find none ſo effectual as the plough and harrow: for a drag is nothing more than a harrow with a ſcarifier made by the teeth, having a kind of hoe at the bottom, ſo as to get under couch-graſs, or any ſort of weed, and ſo to pull them up inſtead of cutting them. This is an inſtrument proper only to be uſed after drill-crops, and in fallow-land; for, the land then lying in ſmall ridges, and the manure all incloſed within them, the

ſcarifier

ſcarifier, by going acroſs the ridges, pulveriſes the mould, and mixes the manure much better than the plough is capable of doing, and performs the work with leſs expence. Indeed land ought not to be ploughed after drill-crops until cleaned, which muſt be done by the ſcarifier.

Mr. Cooke's implements for drill-huſbandry are by far the moſt complete of any I have ſeen. But the cleaning of land depends full as much on the ſkill and integrity of the labourer, as on the choice of the implements proper for the buſineſs. Every thing may be expected from good tools in the hands of a *workman*; but in the hands of a *bungler* even the beſt of tools will produce but ſorry work.

The expence of cleaning land is trifling in compariſon with a good or bad crop: and, if land has a drill crop every other year, as before recommended, a number of utenſils will not be found neceſſary; ploughs, harrows, rollers, and a drag, will be ſufficient.

A drag is uſually made about ſeven feet wide behind, and of a triangular form; with about thirteen teeth in each of the ſides, placed in ſuch a manner as to croſs each other, and faſt-

ened in with ſcrews at top. If you wiſh to make your drag into a ſcarifier, the teeth ſhould be wedged in like a coulter, as you muſt have a different ſet for ſcarifying.

Mr. Cooke's ſcarifier, or horſe-hoe with teeth, is intended to ſcarify between the rows of drilled corn. To me, however, it appears of very little uſe, except to lighten the ſoil; as I can find nothing equal to a plough, for the purpoſe of cleaning land, and earthing the crop. The greateſt part of my drills are at leaſt two feet aſunder, and conſequently wide enough to admit of a plough going between the rows. If the rows were nearer to one another, a ſmaller plough might be made to go between them.

I have tried double-moulded or double-breaſted ploughs to earth up the rows: but they will not at all do in drill-huſbandry, as you cannot humour them to the width of the rows, which are ſometimes a little wider or narrower; and if they vary but an inch or two, it deſtroys the effect intended, as the mould cannot be regularly raiſed, and the corn will be in ſome places high, in ſome low. A common plough will perform this work to perfection: the expence

amounts

amounts to not more than one ſhilling per acre, and the ſervice rendered the crop is worth a pound at leaſt per acre, excluſive of the advantage of cleaning the land better than by any other means; for when you ſee a weed, you may with a common plough go ſufficiently deep, or give it what direction you pleaſe to take it up.

I have tried Cooke's ſcarifier, and one invented by myſelf, for cleaning ſtubble after harveſt; but never found it anſwer ſo well as the plough and harrows. I much approve of Mr. Ducket's method of drilling: Mr. Cooke's drill frequently delivers the corn thicker in one place than another. Mr. Ducket's is of ſo ſimple a conſtruction that it may be made out of a drag; for it is only having a number of mortices to put the ſmall ſhares in, (that is, double the number of holes;) for I am of opinion that white corn of all kinds ſhould be ſown not leſs than ſix inches aſunder. The thicker it grows upon good land, the better: there is nothing to be feared from ſmothering it, as the product is at the top. Crops of white corn are liable to break down and receive great damage by wind

and

and rain: but the thicker the crop, the more likely it is to ſupport itſelf, as it will be ſhorter in the ſtraw, and a weak ſtraw or ſtem may be upheld or ſupported by a neighbouring ſtrong one. Good land will produce long ſtraw and heavy ears; and if the corn is ſown thin, it muſt of courſe fall to the ground; and ſhould heavy rains come when the blade is green, the ear cannot arrive at perfection.

There can be no doubt that corn will thrive much better when regularly depoſited at certain depths. Therefore, if coulters made of wood were put into the drag, to be uſed after the land is harrowed and pulveriſed, to mark out the diſtances and the depth you intend your corn to be depoſited (the quantity is eaſily aſcertained); it might then be ſown by the broad-caſt, and buſh-harrowed-in.

This drag may be made into a ſcarifier, and drill likewiſe if required. There muſt be two wheels to run before it, and a pair of ſtilts behind for a man to ſteady it and ſtrike the depth of the drill. This method, or the drill-roller, I intend uſing in future for ſowing all white grain broad-caſt. But the land muſt firſt be harrowed and drilled, as above directed. As

to

to diſtance, every one muſt act according to circumſtances, as no general rule can be obſerved in that reſpect. Poor land will not ſupport ſo much grain as good land: therefore the quantity of ſeed-corn ſhould be in proportion to the quality of the ſoil; and to make the diſtances nearly four inches every way is proper on moſt lands.

The Rotherham plough I prefer. As to the weight of the harrows, and the length of the teeth, they muſt be proportioned to the nature of the ſoil. Light ſoil, or ſandy land, requires much lighter harrows and longer teeth than ſtrong clay. All harrows ought to have their teeth racked, or inclining forward; by which means they cling to the land, and cut as well as harrow the weeds. Taken hold of by the harrow, the weeds riſe upwards and come to the top: and the harrow does not riſe at every obſtruction, but will do more ſervice in leſs time. When your harrow is made, you muſt obſerve that the teeth all incline one way.

A drag with teeth fixed by wedges inſtead of ſcrews, to take out and put in readily, and ſet to any depth you like, is a very uſeful inſtrument of huſbandry. Where women and children

dren are not to be had to rake up the weeds with a hand-rake (an inſtrument I am very fond of), a twitch-rake will be uſeful. It is generally made with two heads about ſeven feet long, having in each head two rows of teeth ſeven inches long, twenty-four in the hinder, and ſeventeen in the fore-head. The heads are placed about eighteen inches aſunder, and are in ſubſtance about two inches ſquare; but if made round, they will be better. There are a pair of ſhafts for the horſe to draw by, and a pair of ſtilts by which the man who follows may direct it. The drag is ſeven feet; the hind bull has ſeven teeth twelve inches long; the next bull is ſix feet two inches long, with ſix teeth twelve inches long. The teeth are made round, with a ſmall turn at the bottom, and ſhaped like a bit of a hoe, to prevent the weeds from ſlipping at bottom, and to cauſe them to riſe to the top of the land. The two bounds are coupled together by two pieces of wood bolted upon them two feet four inches aſunder; and if deſigned to be changed into a drill, the two croſs-bars muſt be long enough to put a pair of ſhafts on for a horſe to draw and ſteady it,

and

and a pair of ſtilts behind for a man to ſtrike the depth of the drills.

I have made trial of numbers of horſe-hoes and hand-hoes of different kinds to drill crops: but they never thoroughly anſwered my purpoſe. My land was left foul; my crops were ſcanty; and I was vexed and aſhamed of having ſquandered ſo much money on the drill-ſcheme, until I luckily hit upon the method of uſing the plough, as here directed, and of putting the manure into the drills, &c.

The ſcarifier muſt be made ſo as to cut the roots of couch-graſs at bottom as deep as the plough goes, that they may be drawn by the harrows out at full length without breaking.—Such ſcarifiers are very proper for thiſtles, bracken, or wild oats, or almoſt any thing but twitch. They muſt be kept ſharp, or they will riſe out of the ground on the leaſt obſtruction.

Weeds which ſtrike with a tap-root are not eaſily cut by a blunt ſcarifier, which frequently trails them down and leaves them growing. I have an invention for ſuch purpoſe ſuperior to the plough or ſcarifier. It is made of a triangular form, with a beam, and two ſmall wheels under

under the beam, to run before it in the ſame manner as in the Norfolk plough. There are three coulters with a ſhare riveted under each of them, made at the point, like a fleam, ſharp, and about fourteen inches wide. The coulters penetrate under the mould as deep as the plough, and, without moving the earth much, cut up thiſtles, brackens, &c. better than any inſtrument I have yet met with. Where ſuch weeds are very numerous, I uſe a beam with one wheel, into which I put one of the coulters, to cut between the rows of the drills: it will penetrate any depth that can be required. The one with three ſhares will with a pair of horſes do as much work in one day as three ploughs. It is to be obſerved, this machine will work only upon light land, when the fallow is well broken, and nearly clean of twitch. The frame of the drag, by changing the teeth, will do all thoſe things. Where kitlocks grow, this machine will be found very uſeful; and it is of ſuch a ſimple conſtruction that any perſon may make one.

In reſpect to ploughs, almoſt every county has its favourite ſorts, though each deſigned to anſwer

anſwer the ſame purpoſe; but the plough which coſts the leaſt money, is the lighteſt to trail, and makes the beſt work, is of moſt value. In Hertfordſhire they uſe a very ſimple plough, which does her work well.

The teeth of all harrows ought to be put in with nuts and ſcrews to faſten them in the bound, ſo that when they want ſharping they may be taken out and replaced without injuring it.

The coulters for the drill, if made of wood, ſhould be of a triangular form at the part which goes into the land. To make the drills to depoſit the corn in, the width muſt be ſuch as will leave a proper ſpace for the corn to fall in: this depends much upon the quality of the ſoil, and the depth the corn is intended to be depoſited. Coulters made of iron are beſt, as wood is apt to clog and impede the operation.—They ſhould be of a triangular form, with ſharp ſides towards the horſes, and have a point like a ſmall plough-ſhare.

In ſhort, the implements of huſbandry are ſo ſimple, and in ſo general uſe, it is almoſt unneceſſary to deſcribe them. However, I will ſubjoin the dimenſions of thoſe which I uſe on my own farm:

Small Harrows.

	F.	I.
5 bounds on each half-harrow, length of each - - - - -	4	0
5 teeth in each bound—length of teeth	0	10
Width of harrow - - -	2	6

3 ſlots and 1 cap to each half-harrow.

Large Harrows.

4 bounds on each half-harrow, in length	5	0
6 teeth in each bound—length of teeth	0	11
Width - - - - - -	3	2

3 ſlots and 1 cap to each half-harrow.

N. B. Theſe harrows are hung together by crooks and vartuals at a proper diſtance. The harrow-teeth are faſtened in the bounds with nuts and ſcrews—by far the beſt method.

Rotherham Plough of the Scotch Make.

Length of beam - - - -	6	0
——— of ſtilts - - - - -	6	0
Height of ditto - - - -	3	0

Plough-head

	F.	I.
Plough-head - - - -	2	2
Stand-ſhare - - - -	1	8
Length from beam-point to ſhare ditto	1	6
Width of ſtilts - - - -	2	2
Ditto of mould-board - - -	1	1½
Length of ditto - - -	2	1

Old Small Harrow.

4 bounds each, length of each bound	3	9
Width of harrow - - -	2	7
6 teeth in each bound—length of teeth	0	10

2 ſlots and 1 cap.

Parkinſon's Scarifier.

Length of the beam - - -	6	0
Width at the hind end - -	3	10
Width at the middle ſhares - -	2	6
Length of each ſide - -	4	0
Length of ſtilts - - -	4	6
Length of the two ſhares for the hind end	2	6
Breadth over the broad end or heel of ditto - - -	1	0

Length

Length of the part which faſtens the ſhare, and prevents its moving backward	1	6
Length of the two middle ſhares and the one near the end	2	4
Breadth over the heel or broad end	1	6
Length from heel to point of broad part	1	2
*At top of the ſharp part or leg of the ſhare	0	3
*At bottom of ditto	0	4
Length of the part which faſtens the ſhare to the wood, and prevents its moving backward	1	5

Parkinſon's Horſe-hoe.†

Length of beam	5	0
Ditto of ſtilts	4	0
Width of ditto	2	6
Height of ditto	2	0
Ditto from the ſole	1	6
Length of the rake	1	5
Width of ditto behind	1	0
Ditto of ditto before	0	9

* Theſe are the ſame in hind end ſhares.

† The ſhare of the ſame dimenſions as in the ſcariſier.

Three

Three teeth on the hind part, two before
—length of them - - - - 0 8

Common Rotherham Plough of beſt Make.

Length of beam - - -	6	6
Stilts - - - - -	6	1
Stand-ſhare - - - -	1	9
Width of mould-board - -	1	0
Length of ditto - - -	2	2
Ditto of plough-head - - -	2	1
Height of ſtilts - - -	2	11
Length from the beam-point to the ſhare-point - - -	1	7
Width of ſtilts - - -	2	6

SECTION LVII.

Method of treating Grazing Land in the moſt advantageous Manner: Stocking with the proper Stock according to the Quality.

THE method of ſtocking barren ſoils with the aſſiſtance of the plough has been before laid down. All grazing land of rich quality ought to

to be ſtocked with ſheep, cattle and horſes, ſo that the graſs may be eaten clean off; for, unleſs it is regularly depaſtured, much damage enſues. Each of the above three kinds of animals prefers, as moſt palatable food, ſome graſſes which the others reject; and none of them will bite near their own dung, though they may near that of others: and thus they conjointly contribute to keep the paſture level without much expence. Paſtures ſhould be kept as level as a bowling-green, both for ornament and uſe; for, by one part being left higher than another, the long graſs keeps increaſing in patches; and land, where it grows, may be conſidered as taken away from the paſture, as the cattle will almoſt ſooner ſtarve than eat it. By leaving the ſort of graſſes the animals refuſe from year to year, the land increaſes in uſeleſs plants, and diminiſhes in uſeful ones; as the ſeed of ſuch plants continually drops, and the uſeful ones are prevented ſeeding by the cattle eating them. Now were ſuch paſture mown in thoſe places, it would give the uſeful plants room to grow. It is always ſaid, Ill weeds get up quick. So they do: on the beſt part of a field

field you will find nettles—and if ſuffered to grow, nothing elſe can; if the nettle be deſtroyed, the beſt graſs will ſpring up.

There are in this kingdom an infinite number of acres of rich and excellent land, which, from bad management, and from want of judgment in ſtocking, become of no more value than a barren ſoil. To ignorant managers a barren is of equal importance with the fineſt loamy ſoil. To ſee a piece of fine fertile land with a few horſes on one part, a lump of thiſtles in another, a bunch of vigorous nettles on another, and with a number of tufts of long graſs which the horſes never meddle with, is enough to make the ingenious induſtrious huſbandman ſigh with regret at the waſte, and to blame the egregious folly of the occupier!

Were the graſs juſt mentioned mown and given to the animals in the fold or ſtall, as before recommended, they would eat it, increaſe the dunghill; and thus the graſs would ſerve two good purpoſes at once. When the tufts are cut down, young eddiſh grows up in the place, which all cattle will greedily feed upon. If we ſuppoſe that one half of the graſs-land is loſt

for

for want of good management, the farmer, by following the above method, will find himself virtually poſſeſſed of double the quantity he poſſeſſed before; but I can aſſure him the proportion will be much greater.

Theſe inſtructions will be particularly uſeful to tradesmen who take a paddock at a very high price to aſſiſt them in keeping a horſe, and, from want of proper management, ſuffer it to be over-run with long graſs and weeds; for, were he to have the graſs mown and given to his horſe in the ſtable or fold, the ſame paddock might afford him food the year round, and perhaps to a cow during the ſummer.—It may be ſaid, "A horſe will eat graſs a month ſooner than it will be ready to mow." That is true: but if you only mow the firſt year ſo much graſs in that field as the horſe has preſent occaſion for, and make hay of the remainder, you will have ſufficient to keep your horſe until the graſs is ready.—Another objection will be made probably to this method: "It is not ſo good for a horſe's feet to remain in the ſtable." There is ſome weight attached to this objection: but I am inclined to think that great part of the

lameneſs

lameneſs which horſes ſuffer in their fore-feet, ariſes from the feet being kept too hot and dry. A horſe is never lame from that cauſe, in his hind feet, which ſtand loweſt, and are in the moiſteſt part; nor does he by choice ſtand with his head up-hill. The inconveniency undoubtedly may be remedied, by letting the horſe have a ſmall fold to run in; ſo that when rain comes in the ſummer, as the litter would be wet, his feet would be moiſtened. A horſe will naturally prefer a conveniency of this kind to a ſtable; except in wet weather, when he ſeeks the ſtable for ſhelter; or in very hot weather, when the ſun and flies become troubleſome. The tradeſman by this means would always have his horſe ready, without the trouble of driving him about the field for ſome time before he could catch him: and this buſineſs may be done in many inſtances by the tradesman's apprentice, without the expence of keeping a ſervant; or if done by the maſter himſelf, it would be exerciſe to keep him from growing fat.

In ſuch grazing land as is intended for the purpoſe of feeding cattle, a few ſheep are ab-

ſolutely neceſſary to eat up the weeds. If any part of the paſture be getting into bents, or higher graſs than it ought to be, and the animals begin to neglect it, you muſt mow it immediately, and as near the ground as poſſible; for the cloſer you cut down ſuch coarſe parts, the ſweeter and the quicker will the graſs ſpring up in the place. Could animals by hunger be driven to eat the long graſs, they would not fatten upon it; for, as the nearer the bone the ſweeter the fleſh, ſo the nearer the ground the ſweeter the graſs: it is not ſo much the quantity as the quality of the food that muſt be attended to.

It is a common complaint, that their land is good in ſpring, but it goes off. Is this to be wondered at, when one third, or perhaps one half of the field is become ſo rank that not one animal in the paſture will bite a mouthful of it? Suffer the very beſt piece of graſs land, entirely free from weeds, to lie without either eating off the graſs, or mowing it; and in a few years it will be over-run with weeds, have very little uſeful graſs in it, and in fact be little better than rubbiſh.

SECTION

SECTION LVIII.

Method of treating Meadow-land, and harveſting Hay.

THROUGHOUT this Work the reader will find many inſtructions reſpecting the treatment of meadow-land, and they may all be reduced within a very ſhort compaſs; manuring, watering, and cleaning. If the occupier will pay proper attention to theſe three articles, he need not be in fear of a ſcanty crop.

To ſhew what bad management it is to deal out manure with a ſparing hand——we will ſuppoſe a farmer takes a load of hay to market, and brings no manure back. For the hay he receives four pounds, the produce we will ſay of one acre of land, for which he pays thirty ſhillings yearly rent. The next year, to his mortification, he finds a decreaſe in the quantity of the produce, and may think himſelf well off if he experiences a loſs of five ſhillings only, and receives three pounds fifteen ſhillings, inſtead of four pounds. The ſucceeding year there is again a further defalcation, and the weight of hay

hay probably ſinks to half a ton per acre, for which he receives forty ſhillings in caſh. But his rent is invariable: that continues at the old ſtandard of thirty ſhillings, and leaves only a deſpicable profit to maintain his family, pay taxes, mowing, making, &c.

We will now try another method of treating this land. Inſtead of mowing it for hay, and ſelling the produce, we will calculate what can be made by milch-cows, or by feeding cattle. From the price we allow for the land, and likewiſe for the hay, we muſt ſuppoſe the ſituation pitched upon to be near a good market; and from milking cows, making butter, and fattening calves, muſt we derive our profit. Amongſt the various uſes to which the milk may be applied, that of fattening calves is perhaps the moſt profitable: a calf, if properly managed, will pay five ſhillings per week for his keep. If you make but five pounds of butter weekly, you receive five ſhillings; and there will remain milk and butter-milk to fatten a pig, which will pay one ſhilling per week more. In ſummer cheeſe may be made, and the profit will be nearly on a par with that on butter; for

for the whey may be appropriated to the feeding of pigs, though it may eaſily be conceived not to be ſo nutritive as milk. We will allow two tons of hay for the keep of a cow for twenty-five weeks, and that two tons of hay would ſell for eight pounds. The cow earns per week ſix ſhillings, which amounts to ſeven pounds ten ſhillings; and for the hay ſhe has eaten ſhe will give back two loads of manure, the value of which, at five ſhillings per load, added to the ſeven pounds ten ſhillings, makes a complete balance to the price of the two tons of hay. One man may very well look after a ſcore of cows: his wages will be nine ſhillings per week, which is not quite five-pence halfpenny per cow. But not to be over nice, we will throw aſide the fractions, and reckon the expence at ſix-pence per cow per week; and allow the man ten ſhillings wages, the proportion of which to each cow will be twelve ſhillings and ſix-pence for the twenty-five weeks. On the other hand, the cutting and truſſing the hay is worth two ſhillings and ſix-pence per ton: and the carrying to market is worth ten ſhillings. The expences, therefore, on two tons of hay

hay will be twenty-five ſhillings, ſuppoſing it ſold: but if uſed on the farm in keeping a cow, the expence on the ſame quantity of hay will be only half a crown per ton—ſo that there is a clear ſaving of ten ſhillings per ton by eating the hay at home. But ſuch ſaving is ſmall when compared with the profit ariſing from the manure, by making it into a compoſt as before directed. There is likewiſe the pig-manure to be added, which may at the loweſt eſtimation be rated at five ſhillings more in favor of conſuming the produce at home. The cow may go ſix weeks dry; but that loſs will be compenſated by the calf, and the allowance I have made of three pounds of butter for five weeks in my eſtimate.

Fattening cattle will pay as well as any thing; although that buſineſs may be ſubject to great variations in reſpect to profit. It is no uncommon circumſtance to buy in a beaſt which ſhall pay eight pounds for the winter-feeding. To thoſe who have not tried this method, or not been accuſtomed to feed cattle on hay, this perhaps may ſeem incredible. But on the farm at Aby-Grange we had hay grew upon land

that

that in theſe times is not worth more than from ſix to ten ſhillings per acre, and that hay would feed bullocks from eighty to a hundred ſtone weight. We ſold them at from 18*l.* to 20*l.* each, when beef was at 4*s.* 6*d.* per ſtone. Theſe bullocks would have from ten to eighteen ſtone of fat, reckoning fourteen pounds to the ſtone: and I never knew any of them eat other food than hay which grew upon the poor land before mentioned, and which land never had any manure but what the cattle, horſes, &c. depoſited when eating off the eddiſh, and the greateſt part of that was carried away for the uſe of other land.

I hope I have been able to convince the farmer, that, by managing his meadow land in the manner recommended, and conſuming the produce at home inſtead of ſelling it and impoveriſhing the land, or being under the neceſſity of purchaſing manure, he will be a very conſiderable gainer. His buſineſs will be more compact, and conſequently done with more eaſe; and he will have fewer horſes to keep.

As to harveſting hay, I muſt obſerve, that much of our ſucceſs in feeding cattle at Aby-

Grange

Grange depended upon the hay being properly got in, regular feeding, and properly ordering the cattle. In the county of Lincoln hay-makers are not ſo numerous as in Yorkſhire.—The hay made in the Yorkſhire method is not much ſuperior to ſtraw. It is true it retains a green colour, by ſpreading after the ſcythe, turning the next day, and then tedding up at night; ſpreading abroad the next day, and ſo on until ready to cock. When firſt I ſaw hay of this kind, I thought, from the fine colour and ſweet ſmell, that it would prove as good as corn: but as I kept a team of horſes, they ſoon convinced me of my error; and I was obliged to purchaſe corn in greater plenty, or let my horſes ſtarve. I was juſt as much diſappointed in this hay, as in grinding corn for my working-horſes.

The method of making hay in Lincolnſhire is, after mowing, to let it lie in the ſwath for ſome days, until it gradually dies, and thus retains its juices. When ſufficiently dead, turn the ſwath over, and the next day ſhake it up and ſpread it, give it as much of the ſun and air as poſſible, and then cock it. In a few days

after

after cocking it will be ready to ſtack. I have found this ſort of hay of a more fattening nature than the hay made by the other mode, and incomparably better for working horſes. During the time I lived with my father, our hay was made in the above manner; and I never knew us give either corn, cake, turnips, or cabbage to feeding cattle in the winter, and we had as fat oxen as any I ſee in theſe days; which is a proof of the mode of harveſting hay being a good one. There are indeed ſome inconveniences attending the method: it will be longer on the ground; but then it will be in a much ſafer ſtate when lying in the ſwath, than when ſpread. Beſides, in the Lincolnſhire method, there is a very great ſaving in the expence.

SECTION LIX.

Carriages moſt proper for Huſbandry.

IN the choice of carriages much depends upon ſituation; but there is one certain rule which will hold good in every ſituation, that is, that all carriages ſhould be upon as ſimple a conſtruction as poſſible.

The fewer the number of carriages a man keeps, the leſs his expence; for when they are not employed, they are continually going to decay. Some people are fond of a variety of carriages to do their buſineſs with: but I prefer one ſort only in farming, either carts or waggons; for with either the farmer may do all that is neceſſary—he may carry his hay, his corn and manure with the ſame carriage.

Carts are beyond doubt the cheapeſt and the beſt kind of carriages, and may be uſed in almoſt any ſituation. In a flat country they are preferable to any kind: in a hilly country, ſome objection may be made to them when loaded high; for, going either up hill or down, they are both troubleſome and dangerons. But in

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the moſt mountainous countries they are under the neceſſity of uſing them, becauſe no other carriage can ſo eaſily be dragged up hills.

A cart requires leſs power to draw it than a waggon, and, if properly made, will carry top-load ſufficient of hay, corn, &c.: but in general carts are badly conſtructed. The body of a cart ſhould be made as wide as the wheels will admit of; by which means the ſides may be kept ſo much the lower, and the body notwithſtanding hold the full quantity, beſides being by ſo much the ſtronger. The ſides ſhould not be upright, but flying out gradually towards the top: and when ſide-boards are added, you may, by putting them on, increaſe the ſize of your cart at pleaſure. This method is practiſed by the cowkeepers in the vicinity of London, who enlarge their carts ſo as to carry double loads upon occaſion; and it ſurely is the beſt poſſible means of making a cart carry a great burthen in a ſmall compaſs. By the ſpreading of the cart at top (or ſhelving, as ſome call it) the top-load lies more ſnug and ſteady. The wheels of a cart for huſbandry ſhould be low; for then it will be eaſier to fill

it

it. The low wheels are not only the cheapeſt, but they are the ſtrongeſt and moſt laſting.—

Although a cart carry leſs in quantity at one time than a waggon, I am of opinion that more work may be done in a given time with the ſame number of men and horſes by carts than by waggons, in the general run of huſbandry buſineſs, eſpecially where the diſtance is ſmall between loading and unloading. I have always found ſmall loads to be handy, and ſeldom attended by any misfortune in the ſhooting or tumbling out of the load. I am well convinced that carts are beſt for the uſes of harveſting, for carrying manure, and in ſhort for the general purpoſes of huſbandry.

If waggons be uſed for huſbandry, they ſhould likewiſe be conſtructed wide and low. Manure may be carried in theſe ſort of waggons nearly as well as in carts. Broad wheels are improper for paſſing and repaſſing upon tillage land; if in fallow, they preſs all the goodneſs out of the ſoil, and make the ground ſo hard as to prevent its being ploughed until wet comes. On graſs land, broad wheels are proper for all uſes.

SECTION

SECTION LX.

Of raiſing Foals for Uſe in the beſt Manner.—Of caſtrating Foals and other Animals.

IN raiſing foals for uſe, great care muſt be taken not to ſtop their growth by ſtarving the mares, or by ſtinting them of a ſufficient quantity of food; for keeping young animals in a poor half-ſtarved condition can never anſwer any good purpoſe to the breeder. The trouble of getting a ſtinted foal fat is the leaſt of the inconveniences attending the poor keeping. A horſe is intended for hard labour, and is, when grown, coſtly in maintaining: his conſtitution therefore ſhould be well taken care of when young, by giving every poſſible aſſiſtance to nature.

It is a miſtaken notion of ſome who perſiſt in working the mares when the foals ſuck them; for if a foal will not pay for the ſupport of its mother, it is not worth breeding. Foals ſhould ſuck till about the beginning of September.—When firſt weaned, they muſt be kept in a convenient roomy houſe, with a low rack and manger for hay and oats. The hay muſt be very

very ſweet and fine, eſpecially at firſt, whether it be ſaint-foin, clover, or meadow: but I think carrots the beſt of all food for foals, as they keep the body open, which is abſolutely neceſſary to be done.

Whatever may be the food you chooſe to give the foals, a ſmall portion of corn muſt be added, with which you will mix a little wheat bran or pollard; and they will ſoon eat and drink freely.

When foals are kept up in winter, they are not to be continually immured in the ſtable, but ought to have a graſs-cloſe to run in, let the quantity of graſs be ever ſo ſmall. There ſhould be a barn or ſtable in the cloſe; and if there be a fold before the ſtable-door the better, as that will not only ſhelter the ſtable, but will afford the foals an opportunity of eating part of their food abroad in fine weather, and cauſe them to grow hardy by taking exerciſe, ſo neceſſary to the preſervation of health. A foal kept in the ſtable cannot poſſibly take ſufficient exerciſe, nor can he even in a ſmall fold.

Many uſeful animals may be treated with ſucceſs in a manner far different from that required

quired for foals. A horſe, to be uſeful, muſt have action, although many are bred almoſt without. In animals deſigned for feeding only, the more docile and tame they are, the better: they do not ſtand in need of exerciſe; for that would waſte their fleſh. But nothing is more conducive to the health of man, or horſe, than exerciſe; and this maxim will be found to apply to children and foals. Exerciſe increaſes the circulation of the blood, ſtrengthens and invigorates the muſcles, promotes a regular perſpiration, accelerates the animal ſpirits, facilitates their diſtribution through the minuteſt parts of the ſyſtem, creates an appetite, and aſſiſts digeſtion. A foal brought up in a ſtable, would be like young maſter kept under the eye of his mother in the nurſery until he were eight or nine years old. At the years of maturity horſe and man would be good for nothing.

When winter is over and the graſs begins to grow, the foals ſhould be turned into ſome dry ground, where it is ſweet and ſhort, and where there is good wholeſome water, that they may drink at pleaſure. By having this attention

paid

paid to them the firſt winter, they will no doubt thrive the ſucceeding ſummer. The following winter they may be kept in the ſtable with not more care than other horſes: but you may give them the ſame opportunity as they enjoyed the firſt winter, of going freely in and out. A young horſe treated in this manner will, when two years old, be as fit for work as many by different treatment are when four years old, and from that age will be able to do ſomething towards paying for his keep. And if intended for ſale, he will certainly fetch a good price; for he will be well grown, active and full of ſpirit.

We will now conſider the difference in point of expence between good and bad keeping, which will nearly make the difference of a good or a bad horſe. The article of expence will conſiſt chiefly in the corn which I recommend to be allowed him. Reckoning ſixty weeks for the two winters, at one quartern of oats per day, the total amount will be twenty-ſix buſhels one peck, which, at 16*s.* per quarter, will be 2*l.* 12*s.* 6*d.* extra expences for one young horſe—a mere trifle when compared with the

difference

difference which will certainly be found in the value of the animal. I do not like beans, or any kind of grain for foals except oats. A foal half-ſtarved in rearing never, or very ſeldom indeed, recovers the injury he receives when young, and cannot be expected to make a horſe of value.

I cannot quit this ſubject without giving a particular piece of advice to the maſter of the foal:—Let him *ſee* that his foal receives with regularity the allotted quantity of one quartern of oats per day: it is probable, if the maſter obſerves this caution, that his foal will thrive better than if he *ordered* half a peck per day to be given him by his labourer or other ſervant.

I do not pretend to ſay that all young horſes are worth corn: I believe there exiſt thouſands in this kingdom who have conſumed more than they were ever capable of earning; but thoſe I have been ſpeaking of are horſes of value, whether for the ſaddle or draught. There are many not worth raiſing on any ſort of food. A horſe that in his prime will not ſell for more than from ſix to ten pounds was never worth half what he coſt the breeder; as the covering

the mare, her keep, and other incidental charges, are to be conſidered: and I will venture to ſay, that if a horſe does not fetch twenty pounds at the age of four years, he does not pay the breeder.

Horſes ſhould only be bred where land is ſituated ſo far from a market as to make it inconvenient to diſpoſe of the produce: but there is no animal pays ſo well, provided you are careful in the breed. If a little more care than is generally practiſed were obſerved, the breed undoubtedly would be better; for there is certainly room for improvement. A farmer goes to a fair with an intention of buying a mare to carry him on the road—a low-priced one certainly. If the fair is of any repute, it will be crowded with horſe-dealers from different parts in ſearch of horſes of all deſcriptions: many of theſe horſe dealers will have commiſſions from gentlemen to purchaſe without reſpect to price; and although the farmer may have had judgment to pick up any thing tolerably active and clever, the horſe-jockeys are ready to run over one another to buy it of him. The farmer, for the ſake of a great profit, ſells his mare, and

puts

puts up with a ſorry, ſtumbling, tumble-down jade! lame, blind, or with ſome other natural blemiſh. As he does not find it an eaſy matter to diſpoſe of his bargain again, he gets his mare covered by a ſtallion of the ſame ſtamp; for half the ſtallions belonging to chapmen are either lame or blind, as they are ſometimes unable to purchaſe one until by ſome defect he is rendered unfit for a gentleman; as a good ſtallion coſts a conſiderable ſum of money.—The owner of the ſtallion tells you he is not a jot the worſe for being blind; it was the effect of a violent cold or fever which fell into his eyes. And when the foal is dropped, it is neither lame nor blind: but by the time it gets to be four years old the eyes are found defective, they grow worſe, and the breeder, not being able to ſell him or her, finds himſelf poſſeſſed of a five years old blind horſe. So it will be in breeding from either ſtallion or mare with natural defects, whether they be blind, lame, or tumblers.

But the breeder determines to croſs his breed, that he may have a coach-horſe; as his mare is rather too weak to carry him and his wife.

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The ſtallion he makes choice of has ſo little action, that he will tire in travelling at the rate of ſeven miles an hour before he has gone twenty miles; he has a large head, long legs, is ugly all over, (though by his being very fat, his ill ſhape is in ſome degree concealed,)—in ſhort, ſuch a one as, were he a gelding, would not fetch ten pounds in a fair! Now, what can be expected from foals ſo got and bred? If they ever fetch twelve or fourteen pounds apiece, the breeder may think himſelf lucky. I have always thought that the likelieſt method to breed of any particular ſort, action, or colour, is to chooſe the male and female accordingly: and ſo of diſorders.

To breed for profit—Let the mare be a tried good one, ſuch as has been really worth fifty or a hundred pounds; and whatever blemiſh ſhe may have, take care it be an accidental one only, and not a natural one. Let the ſtallion anſwer the deſcription in every reſpect as the mare. The foal may then be expected to fetch a high price, and not coſt more, perhaps not ſo much, in rearing, as a bad one. To encourage the breeder to purſue the plan recommend-

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ed, I will tell him a ſhort anecdote within my own knowledge.

A neighbouring farmer ſold a well-bred hunting mare, four years old, to a London dealer, for fifty pounds. When ſhe was offered for delivery the dealer had repented of his bargain, and refuſed to accept of her, pretending ſhe was lame: the farmer took her back without grumbling, rode her to market, and made her carry ſheep-ſkins, butter, eggs, &c. and hunted her in turn during the next winter—in ſhort, ſhe was a horſe of all work. In Auguſt following the ſame horſe-dealer came again, and, in the courſe of converſation, enquired what the farmer had done with the mare. The anſwer was he had her ſtill. "Ah, ah!" replies the horſe dealer, "I thought you would not eaſily get rid of her. Lame as a cat, I ſuppoſe?" "You are miſtaken," ſays the farmer; "ſhe is perfectly ſound, and has never been lame ſince." The dealer deſired to ſee her; ſhe was led out, and he immediately told the farmer he was ready to pay him the fifty pounds for her. "No," ſays the farmer, "that will not do now: you muſt double the doſe; the leaſt I will take is one hundred

dred pounds, not a farthing leſs." After much haggling the dealer paid down the hundred, and took the mare away. This mare will be allowed to have paid well for corn. She was got by a ſon of Atlas out of a half-bred mare.

If breeders in general would pay as much attention to the breed of horſes as Mr. Bakewell did to the breed of ſheep, they would no doubt improve them in an equal degree, and find their advantage whether they bred for the collar, for the road, hunting, or racing. Mr. John Hutchinſon has ſhewn his knowledge of the art of breeding by the number of good racers he has produced; and he always puts the beſt proved racing ſtallion to a thorough-bred mare that has given undoubted proofs of her qualifications. Such as theſe are certainly more likely to breed good racers than a mare and ſtallion who every time they have been tried have been diſtanced.

If any one doubts the neceſſity of keeping animals in a thriving ſtate while young, eſpecially of giving them ſufficient exerciſe, they have a cheap and expeditious method of making the experiment. Take two greyhound whelps

whelps from the bitch, of the ſame litter; keep one in good condition, and the other poor. That which is kept poor will never recover the ill treatment he received when young. This experiment I have known frequently tried. The beſt time for caſtrating colts is when they are three months old. In this reſpect, as in many others, many will differ from me: but my aſſertion is grounded on experience. As to the time of performing the operation, I prefer hot weather, when the flies are very ſtrong, and when the foal ſucks; for the warm milk is of great ſervice by keeping the body of the foal open, and accelerates the cure. By the mare's continually moving about, the colt will of courſe follow: exerciſe cauſes the blood to circulate, a ſuppuration without feſtering takes place, the diſcharge of pus will be gentle and eaſy, and the wounds gradually heal.

The above operation is frequently performed at a very improper ſeaſon of the year, and at an improper age in reſpect to the foal. It was a cuſtom with my father and other farmers in our neighbourhood to cut colts in April or May at a year old; and great inconveniences and

loſſes

loſſes have ariſen from the practice of cutting them at that time. Some would not have them cut until they are three or four years old, which I diſapprove of very much. If you let a horſe go long with his ſtones, he begins to ſhew courage from them: and when they are taken away, he becomes more dull and ſloomy than if he had been gelded when young: he cannot pine for the loſs of what he never knew; and much danger has attended the delay. I preferred the month of July, and never once failed of ſucceſs. Three months I think the moſt proper age.

It is neceſſary to keep the colts with their mothers in the ſtable a few hours prior to performing the operation, that they may cool and empty themſelves. If the weather ſhould turn out rainy before the wounds ſuppurate and diſcharge, it will be adviſable to take them into a ſtable for ſhelter, to prevent their catching cold, which may be attended with bad conſequences; as great caution ſhould be obſerved in every inſtance that animals are not expoſed to the wet where colds are feared.

A colt that has gone uncut until he is a year old or more, and who is kept in the ſtable, and

cut

cut perhaps in the month of April when the weather is frequently cold, is liable to ſwell much. In ſuch caſe, when you find the parts inflamed, and the lips of the wounds adhere ſo cloſely together as to incloſe the matter in the bags, thruſt your finger into them, and make a ſufficient aperture for the free diſcharge of the pus or matter; and if the inflammation be violent, or the ſwelling large, divide a peeled onion, and put it into the orifices.

The method uſed at preſent in caſtrating a foal or young horſe is by cutting open the cod or ſcrotum, nipping the ſtring with a pair of ſheers made for the purpoſe, taking out the teſticle, and then, to ſtop the bleeding, ſearing the ſtring with a red-hot iron. Now this might be done with greater ſafety, and with leſs pain to the animal, by what is called *twitching*, or by tying round the part tight with a ſtring, which would gradually eat it off, and prevent the air from getting in to irritate it; for if the air get in, inflammation and mortification frequently enſue. Male animals might be caſtrated by *twitching* with much greater ſafety, and any one might do it; it is ſo very ſimple that

the animal by this means would not ſuffer ſuch violent pain as muſt be the caſe at the time, and therefore would not waſte ſo much in his fleſh, or be ſo liable to die. If, when extracting the teſticle from a lamb, you examine the length of the ſtring, you will be convinced that it muſt come from the very vital part of its loins: How painful as well as dangerous then muſt be the operation? Indeed, I have known great numbers die under it: and I am of opinion, not one animal in a thouſand would die if caſtrated by twitching.

Lambs ought to be caſtrated when about ſix days old, and in fine weather: but, if twitched, the weather would not be of ſo much conſequence, nor would their age, provided it were done before fly-time. I ſhould adviſe to twitch them when about a fortnight old. This manner of caſtrating makes the leg of mutton much handſomer. Calves undergo the operation at the age of ſix weeks; and, although I never knew an inſtance of a calf dying from caſtration, I ſhould prefer twitching him.

Pigs ſhould likewiſe be twitched; as I have known them die very often from being gelded according to the common method.

You

You may twitch animals of any age with ſafety, if you attend to the following directions: Take a cord of ſtrength according to the animal's age and the ſize of the part to be twitched, wax it with ſhoemaker's wax, and then greaſe it that it may ſlide with greater facility. If the part be likewiſe greaſed, it will twitch the better. Then tie the ſtring tightly round the cod or ſcrotum, above the teſticles, ſo that the circulation of the blood and other fluids to and from the teſticles may be totally interrupted. The ſcrotum and its contents will thus ſoon be deprived of all ſenſation, rot and fall off.— For twitching, a peculiar knot is uſed.

The above directions are drawn from my own experience in caſtrating tups. I have twitched many hundreds, and never loſt one. I have, indeed, known them die; but that was owing to bad management, by cutting off the cod and ſtones as ſoon as twitched; for in that caſe, if the part be not twitched tight, cold may get in and kill the animal. If you leave the part on, that cannot poſſibly happen; therefore on no account ever cut it off. Spirits of turpentine are generally uſed for rams, but muſt not to horſes

horſes or bulls by any means. I do not think there is any occaſion to apply any thing but greaſe, and that only to aged animals.

SECTION LXI.

Breaking of young horſes, &c.

I DO not know any thing more miſunderſtood than the breaking of horſes. This is generally done by ſome idle drunken fellow, who, if he had ever ſo quiet a horſe to ride, would frequently be ſo intoxicated as to fall from him ſeveral times in a week's riding; and after he is able to recover himſelf and get upon his feet, he will fall to beating the horſe in the moſt barbarous manner; a treatment he never after forgets.

In general, as ſoon as the horſe is haltered, he is tied to a tree and buffeted over the head with a hat, which he ever after dreads ſo much, that if any one meets you on the road, and takes off his hat, the horſe ſuppoſes he is going to be buffeted, and jumps away. The next thing is to tie a ſtring round his liſk, which tickles him ſo

ſo that he learns to kick. They next, with a long whip, whip him round a circle with a long rope; then tie up a foot; then get him upon ſome ploughed land or ſome boggy hole, and, when he is almoſt heart-burſt by whipping about, ſome fellow, for a tankard of ale, is induced to mount him. This egregious horſe-breaker, who only became ſuch from a habit of intoxication, gets drunk with ſome of his companions, and tumbles off. Hence the horſe is branded with the character of a vicious horſe, is allowed little or no meat, and diſturbed of his reſt. Now, by all this cruel treatment, if it be a ſpirited animal, he is irritated into a ſtate of madneſs, and becomes altogether untractable.

The following is the beſt mode of managing young horſes: When you take the foal from its mother, halter it, and lead it about. As ſoon as it patiently ſubmits to be led, tie it to the manger, let it be rubbed with ſtraw-whiſps, take up its feet and clean them. After it ſuffers you to do theſe things with eaſe and ſatisfaction to itſelf, let it go into the paddock or place you intend to keep it in. It may be neceſſary to obſerve, that one perſon ſhould feed the

the foal, dreſs him, &c. Continue to halter him when occaſion requires, and lead him about, as he will never forget the leſſons given him. When you want him for uſe, let him be put amongſt a team of horſes, with a blind halter, and every accoutrement the ſame as other horſes have; but take care he has nothing to pull. Of the team of horſes two ought to be behind him, and one before him; and the perſon who drives ſhould not meddle with him in any reſpect, but let the other horſes draw him about. Do this repeatedly until he becomes gentle: then cauſe ſome one to ride him: in that ſituation he cannot plunge ſo as to throw any one, becauſe the other horſes will keep him from riſing up. I never ſaw any horſe ſo treated inclined to throw his rider.

Thus the breaking of this horſe has coſt nothing; he ſoon becomes manageable, and earns his meat: but then, alas! he has not got what is termed a *mouth*. To make him have a mouth, the horſe-breaker puts a bridle with a very large bit into the mouth of the young horſe, and reins him very tight up, until his mouth is ſo ſore, that, when he mounts him and draws the

the bridle, the horſe runs backward, and, while his rider endeavours to force him forwards, rears up and tumbles backward. Thus he contracts a very bad habit. On the contrary, if the horſe has had the ſmall bit in his mouth hanging looſe, he becomes uſed to it; and you may draw him about as you like, and he will feel no inconveniency from it. It would be better if the bit of the bridle were lapped with cloth, to prevent his mouth getting ſore; for, if ever a horſe's mouth (viz. his gums and lips) is excoriated, the part, when healed, will be callous, and have leſs ſenſibility in it than any part about him, becauſe there is not a free circulation of the blood in that part. The horſe-breaker will endeavour to perſuade you he will make any horſe ride round in his fore-hand, and light in hand—make him walk well, trot well, and gallop as faſt as Eclipſe. He may as well ſay he will make him live in water like a fiſh! Nature has formed the horſe ſuch as he is: the only thing required is to make him quiet, and do all he is able with pleaſure. The breeder of the horſe muſt make him gallop faſt, ride light in hand, &c. by chooſing a mare and horſe proper to breed him from.

SECTION

SECTION LXII.

Rearing Calves for Stock in the beſt and cheapeſt Manner.

TO rear calves properly requires a great degree of attention. If calves are reared with milk at the kit (which is the ſecond-beſt method, ſucking the cow being undoubtedly the firſt), the milk, being ſkim-milk, ſhould be boiled, and ſuffered to ſtand until it cools to the temperature of that firſt delivered by the cow, or a trifling degree more warm, and in that ſtate be given to the calf. Milk is frequently given to calves warm only; but that method will not ſucced ſo well as boiling it. If you give milk over cold, it will cauſe the calf to ſkit or purge. When this is the caſe, put three ſpoonfuls of rennet in its milk; it will ſoon ſtop the looſeneſs. If, on the contrary, the calf is bound, bacon-broth is a very good and ſafe thing to put into the milk.

One gallon of milk per day will keep well a calf till he be thirteen weeks old. A calf may then be ſupported without milk, by giving him hay, a little wheat-bran once a day, with about a pint

a pint of oats. The oats will be found of great ſervice as ſoon as the calf is capable of eating them. The bran and oats ſhould be given about mid-day: the milk, in portions, at eight o'clock in the morning, and four in the afternoon. But whatever hours you chooſe to ſet apart for feeding the calf, it is beſt to adhere to the particular times; as regularity is of more conſequence than many people think. If the calf goes but an hour or two beyond his uſual time of feeding, he will find himſelf uneaſy, and pine for food.

The farmer need not be alarmed at my recommending bran and oats; for the expence of both will not exceed one ſhilling per week, ſuppoſing one quartern of bran, and a pint of oats per diem; and this food will be found of infinite uſe to the calf, not only in reſpect to clothing him with fleſh, but likewiſe keeping his body open, and by that means contributing to his health. Calves reared in this manner are apt to ſuck a rope-end, or any thing of that kind, or they will get hold of another calf's ear, or perhaps his pizzle; by which means they will draw in ſuch a quantity of wind as will

make them heave as if they were ready to burſt. The giving them oats and bran willl prevent this; eſpecially if you take the precaution of tying them up cloſe, for that every one will allow to be a ſure preventative.

It is always to be underſtood, that calves reared in this manner are to be enticed to eat hay as early as poſſible; and the beſt way of doing this is to give them the ſweeteſt hay in your poſſeſſion, and to give them little at a time. Turnips or potatoes are very good food, as ſoon as they can eat them; and they are beſt cut ſmall, and mixed with the hay, oats, bran, &c.

It is not abſolutely neceſſary to give milk to calves after they are one month old; and to wean them gradually, two quarts of milk, with the addition of linſeed boiled in water to make a gruel, and given together, will anſwer the purpoſe, until by diminiſhing the milk gradually the calf will ſoon do entirely without. Hay-tea will anſwer the purpoſe, with the like addition of two quarts of milk, but is not ſo nutritive as linſeed. Hay-tea is made in the ſame manner as we make the decoction from the Chi-

neſe

neſe leaf, only in a larger quantity than ladies generally make it for breakfaſt. My method is to put ſuch a proportion of hay as I think will be neceſſary into a tub, then to pour on a ſufficient quantity of boiling water, cover up the tub, and let the water remain long enough to extract the virtues of the hay.

When you boil bacon or pork, preſerve the liquor or broth, to mix with milk for the calves: it is excellent food.

I have reared a calf in ſummer on whey only; and it has proſpered. But calves reared in winter muſt be fed with hay: clover-hay is the beſt of any for the purpoſe.

Soon after the fatal diſtemper amongſt the horned cattle, many calves were raiſed with porridge of different kinds, without any mixture of milk. My father, at the time of the contagion, raiſed one in that manner, which at the age of ſix years weighed one hundred and twenty ſtone.

SECTION

SECTION LXIII.

Management of Rabbits; what Land proper for a Warren. Means of improving Land by Rabbits.

THE moſt neceſſary precaution to be obſerved, with reſpect to rabbits, is to prevent their being deſtroyed by their numerous enemies, particularly foxes, fumarts or weaſels, gleads, hawks, &c.

In great ſnows, or ſtormy weather, they muſt be ſerved with ſome ſort of food. For this purpoſe it will be neceſſary in hay-time to ſet up a ſtack in the middle of the warren, amongſt or near the burrows, banked round; and when the ſtack-garth is thrown down, the bank makes an excellent burrow for the rabbits to breed in.—The boughs of trees are good for rabbits at ſuch ſeaſon and in ſuch weather, as they are fond of peeling and eating the bark.

Thoſe rabbits which appear weak and poor ſhould be killed off in the proper ſeaſon, for they frequently die in the burrows; by which means both the fleſh and ſkins are loſt: and ſhould they ſurvive, they will not add much to the next year's produce. The

The moſt proper ſituation for a warren is a gently riſing ground, with an aſpect between the eaſt and ſouth, rather inclining to the eaſt, if the ground will ſuit, on account of the morning ſun. The moſt ſuitable ſoil is a ſandy one, dry and warm, that the burrows may be comfortable to the young; for they are very tender, and liable to periſh with little wet or cold. If the land is a clay-ſoil, the rabbits are diſguſted with the trouble of making their burrows, and are tempted to look out for a lighter ſoil. Wet or marſhy land is by no means fit to breed rabbits on.

Rabbits are of a very feeding nature, and on the pooreſt land will get fat in mild weather; but dry froſty weather without ſnow, ſuits them the beſt by far of any.

To turn a warren to the greateſt advantage, if there ſhould be any part of it fit for the plough, the beſt method is to fence it off with a ſod wall, and then to plough and ſow it with ſuch crops as it will bring, until the freſhneſs is nearly worn out. Then lay it down with graſs-ſeeds, throw down the bank that incloſed the piece, and let the rabbits in upon it; by which

means

means you will have a moſt excellent burrow to breed in. The new ſeeds will make excellent feed, and cauſe them to increaſe abundantly. This is a mode of improving land at a very ſmall expence, and will be found to be exceeding profitable. It is the beſt I know of; for ſuch land as is generally appropriated to the feeding and breeding of rabbits, can ſeldom be ſufficiently improved to feed a bullock by the greateſt adept in tranſmuting ſubſtances.

There certainly are many thouſand acres of land in this kingdom which might be much more properly applied, and more profitably, by breeding rabbits than by their preſent management. To attempt a rotation of crops, as directed in this work, on ſome land is a waſte of time and money. But ſuch land as lies compact, I mean in a form as nearly circular as poſſible, and that is as near the deſcription before given in reſpect to ſoil, will be found to yield the moſt profit by being converted into a warren.

SECTION

SECTION LXIV.

Obſervations on Rape; Difference between Cole and Rape: Reaſons why Rape-ſeed does not injure Land.

RAPE ought to be drilled, in the ſame manner as deſcribed for the culture of peas and turnips, in Section XII. with manure in the drills; and, like peas and turnips, ſhould be cleaned in the ſpring by the plough. This, if properly done, would make the land equal to the beſt fallow in the kingdom. The falling of the leaves, and the ſmothering of the crop, would keep it in a perfectly mellow ſtate; and if the ſtraw and roots were immediately cleaned off, the ground ſcarified, and a ſufficient quantity of ſeeds ſown, there would be a crop of rape to be eaten by ſheep betwixt the time of reaping the rape and that of ſowing wheat. This, inſtead of impoveriſhing, would improve the land in a very conſiderable degree, and intermix the manure in the beſt poſſible manner. It is to be recollected that rape has two years' rent upon it, and without ſome management of this ſort cannot

cannot turn out ſo profitable a crop: but by the mode here recommended you get a crop and a half in two years.

Rape-ſtraw ought, like other ſtraw, to be preſerved for manure: and although it be not fit for food, it will anſwer the purpoſe of litter. It is generally thought that rape-ſtraw affords little manure. So would every other ſtraw were it burnt, as is practiſed with that of rape; but no ſtraw will yield ſo much in aſhes. We well know there is more bulk in rape-ſtraw than in any other ſort, and I am of opinion it is alſo heavier.

Rape is a ſucculent plant; and, as it is agreed by the beſt botaniſts, that when rain falls a ſalubrious manure drops from the leaves of ſuch plants, why ſhould not the leaves collected make good manure? Surely it is worth while making the experiment. I have known land produce rape fourteen ſucceſſive years, and bear the ſeven crops without being manured in that time. I am of opinion, that, had the rape-ſtraw been laid in the fold-yard, worked up into a compoſt, and then put in drills and managed as before deſcribed, it would have improved

proved that very land as much as ſome ſorts of manure in uſe. He who ſowed the rape juſt mentioned acquired a fortune of near thirty thouſand pounds by farming. It was looked upon as certain by all the neighbouring farmers, that this repeated ſucceſſion of rape-crops muſt inevitably ruin the land: but when, ſoon after his leaving the farm, it was cleaned and thrown into a rotation of crops, they never were deficient where the rape had grown, as I obſerved before, for fourteen ſucceſſive years. I think it a miſtaken notion in thoſe who ſo poſitively aſſert that land is conſiderably injured by being ſown with rape to ſtand for ſeed; for if rape intended for ſeed is ſown in drills, moulded up in the ſpring, and hand-weeded as often as neceſſary; it would certainly be one of the beſt fallows that could be made for wheat, provided the manure is not forgotten to be put into the drills.

The farmer need be under no apprehenſion of loſs in making the above experiment. I can aſſure him of ſucceſs, provided he follows exactly the method laid down. In reſpect to harveſting rape-ſeed, I would, as ſoon as it is

ſhorn, have it bound in ſheaves and put in narrow ſtacks, in the field, or ſome convenient place, as the ſtalks of rape would prevent its heating; and if in an airy ſituation, it would harveſt properly, and be a great ſaving of ſeed. Thoſe who are in poſſeſſion of the thraſhing machine might ſave much money by thraſhing the rape with it; and the ſtraw, by being more broken, would make better manure than heretofore by the old method.

In reſpect to the difference between cole and rape; in the ſeed, it is ſcarcely poſſible to diſtinguiſh them; but when in plants you may eaſily tell one from the other. Cole in general is intended to be eaten with ſheep, and rape to ſtand for ſeed to be manufactured into oil, which is uſed in ſuch large quantities by the clothiers, by other artiſans, and likewiſe in phyſic. Cole, however, is likewiſe frequently ſown like rape, for the purpoſe of ſtanding for ſeed, from which oil is expreſſed. Cole grows to a greater height when in leaf than rape; and the ſtalks are ſo ſoft and pulpy, that ſheep can eat them very near the bottom. Rape is of a hardier nature, more calculated to ſtand the winter

winter: the ſtalks are rigid, grow buſhy, and branch much, and, when ſpring approaches, ſpread and yield more ſeed than cole. Theſe ſeeds are moſt frequently, I think I may ſay always, intermixed. It would therefore be well worth while for a grower to collect with care out of a crop the different ſeeds, and to ſort them properly; for cole is to be preferred for feeding ſheep, and rape for the purpoſe of extracting oil.

A ſtrong rich ſoil is moſt congenial to both rape and cole. Where nature has not been bountiful in that reſpect, art muſt ſupply the place; and the beſt way to ſucceed is, to follow the method I have laid down.

SECTION

SECTION LXV.

Obſervations on Saintfoin and Lucerne: Culture and Uſe.

SO much has been already ſaid in the beginning of this work reſpecting ſaint-foin, that I will not tire the reader with repetitions, but refer him to Section XIII. As to its great utility, and the general method of culture, I now confine myſelf to the laying down of my ideas reſpecting an improvement in ſowing; and even in that reſpect I have little more to ſay than that I would recommend it to be ſown in drills. And if it were ſown at the ſame time with barley, the ſaintfoin ſeed would be in the ſame rows: but then the barley muſt be ſown thinner, or it muſt come up before the ſaintfoin be ſown. If the barley were ſown ſix inches aſunder, drills might be made betwixt each row for the ſaintfoin ſeed: but I prefer ſowing barley every four inches, and the ſaintfoin ſeed along with the barley; by which means the ſeed would be more diſperſed over the land.

As

As ſaintfoin is a ſmothering crop in the ſpring, it is very ſeldom that the growth is impeded by weeds; and the graſſes do not grow ſo early, nor can they injure the ſaintfoin unleſs it is very thin. There is no doubt but that ſmothering land with a crop is better than having recourſe to ploughs, harrows, ſcarifiers, &c. day by day to deſtroy weeds, for ſuch labour is expenſive; whereas a large crop is attended with profit. If ſaintfoin were ſown alone in drills ſix inches aſunder, and the earth between each row lightened by the ſcarifier, I do not believe any method could poſſibly produce a more plentiful crop.

Lucerne is chiefly uſed as green fodder.—the leaves grow three at a joint, like thoſe of clover; its ſtalks are erect, and after mowing, immediately ſpring up again from the ſtubble or cut ſtumps. If it is made into hay, the treatment is the ſame as that of ſaintfoin: but it muſt be mowed before it flowers. It makes the ſweeteſt food, and one of the moſt fattening hitherto known for cattle; but muſt be given with much caution, or it will cauſe them to ſwell.

Lucerne

Lucerne is beſt drilled at ſuch a diſtance as to admit of being moulded with a plough, ſo as to have an opportunity of tilling the land betwixt each row, in the ſame manner as deſcribed in the pea-fallow. But two feet is too much to allow between the rows: the ſeed might therefore be ſown at only twelve inches diſtance, and a plough may be made of ſix inches ſole to clean between the rows; for a plough is by far the cheapeſt inſtrument for cleaning land, and may be made to anſwer better than any implement I know of.

SECTION LXVI.

Remarks on Flax; Culture, and Management till ready for Uſe.

FLAX is chiefly ſown on ſward-land, wharp or clay ploughed up for the firſt crop: but it will thrive in any land that is tolerably clean and good, if it has lain in graſs a reaſonable time. The land ſhould be ploughed early enough in winter to have the benefit of the froſt, as the mould cannot be too much broken

or

or pulveriſed. When the land is well laid, flat and even, ſow the ſeeds in mild open weather, towards the latter end of March, or very early in April. The Eaſt-country ſeeds are by far the beſt, and, though at firſt the deareſt, will be found cheapeſt in the end. Theſe will anſwer for two, or perhaps three crops; after which it will be neceſſary to change the ſeed. Of the foreign ſeed two buſhels are ſufficient for an acre: but of the home ſeed it will be adviſeable to add half a buſhel more.

When grown up, flax ought not to be gathered before it be fully ripe; for, if pulled before the bloſſom falls, it heckels away almoſt to nothing; and though it ſeems fine to the eye, yet it has no ſubſtance, and the yarn ſpun of it is weak and ouzy. It not only waſtes in the waſhing, but ſuch linen as is made of it becomes extremely thin in the bleaching.

Flax is a very uncertain crop; and I do not recommend it to the farmer as a profitable one. I am not fond of it, for it contributes nothing to the dunghill, though ſometimes it may put much money in the farmer's pocket when it happens to be ſucceſsful. I have known a crop

fetch

fetch fifty pounds per acre. If the ſeaſon proves wet, much weeding will be neceſſary, which, together with the price of the ſeed, will be found very expenſive. I am of opinion that a conſiderable ſaving might be made by depoſiting the ſeed in drills; for by that method the land might be kept in ſuch a ſtate as to be eaſily made ready for wheat; eſpecially as flax is ſo ſoon off the ground. A crop of flax is often followed by a good crop of wheat.

At preſent flax is weeded by hand; and that expence, as it depends ſo much on circumſtances, cannot be aſcertained to any tolerable degree of certainty. The pulling is worth half a guinea per acre. If flax is intended for white line, it ſhould be pulled when it juſt begins to turn yellow. This is abſolutely neceſſary to be done when the crop is too ſtrong and roid, otherwiſe it would rot at the bottom and ſpoil. The pluckers ſhould tie it up in handfuls, ſet them up till perfectly dry, and then houſe them. Flax pulled in the bloom proves whiter and ſtronger than if left ſtanding till the ſeed is ripe; but then the ſeed will be loſt.

That

That which is intended for the fineſt ſort of line muſt be immerſed in water and ſwingled. If the crop be not over ſtrong, it will be of moſt value if it ſtand for ſeed; but then the line will be black, and not fit for fine linen. A good clay or loamy ſoil generally produces the beſt crop of flax.

When you put the line in the pits, let them be filled with ſoft ſtanding water. It is a very good method, after the line is in the water, to cover it with ſods; for by that means it will rate ſooner, and much more even: and if it is trodden hard down, it will be the better for it.

To know when the line is fit to be taken out of the pits, you muſt take ſome up, and if the baſs divide from the bunn (as it is called) it is then ready, and ſhould be immediately taken out. If it remains in the water longer than neceſſary, it rots and is totally ſpoiled. When taken out, it muſt be laid thin upon the graſs, and ſpread to be dried: when dry, tie it up in ſheafs and houſe it. Then brack it with a pair of bracks, ſwingle it with a ſwingle-handed ſtock, and juſt heckle the top end ſlightly; and it is ready for the heckler. The expence at-

tending this proceſs may be eſtimated from fourteen pence to half-a-crown per ſtone.

Sometimes flax is ſuffered to ſtand until nearly ripe, when the boll which contains the ſeed is pulled off, by which method the ſeed is ſaved without much injury to the line: but this advantage can only be taken upon good clay land.

SECTION LXVII.

Hemp; the Culture and Management till ready for Uſe.

HEMP is managed in every reſpect like flax, though of a very different nature; for it cannot be raiſed to advantage but upon very good land. Wharp is the beſt to grow hemp upon, and next to that a warm, ſandy, or ſomewhat gravelly ſoil; but it muſt be rich, and of good depth.

The beſt ſeed for ſowing is that which is brighteſt, and retains the colour and ſubſtance in rubbing. Three buſhels are ſufficient to ſow an acre; but the richer the land is the thicker the

the ſeed muſt be ſown, and the poorer the land the leſs of ſeed. The time of ſowing is from the latter end of March to the end of April, according as the ſpring is forward or backward: but, certainly, the earlier it is ſown the better. Birds of moſt kinds are very fond of this ſeed, and too much caution cannot be uſed againſt their depredations.

The firſt ſeaſon for gathering it is about the beginning of Auguſt, when the fimble or light hemp which bears no ſeed will be ripe. When it becomes ripe, the ſtalks grow white, and the leaves turn yellow at top, and fall downwards: it muſt then be pulled up, dried, bound in bundles as big as may be graſped in both hands, and laid by for uſe. This may be called the firſt crop. Care muſt be taken not to injure what is left ſtanding, becauſe that is to grow till near Michaelmas before it will be fit to gather. This laſt is what is called harle-hemp. When it is gathered, let it lie abroad for three or four days, that the ſun and wind may dry it; and you may then either ſtack or houſe it till you are ready to thraſh the ſeed out.

A good

A good crop of hemp is about equal to a good crop of flax: but the firſt crop, or fimble hemp, is not worth above half as much as the other. The great burthen of leaf it carries when green, from which it is ſaid an excellent manure drops upon the land, makes ſome eſteem it the beſt management of any to follow hemp with a wheat crop.

Hemp is a very proper crop to be drilled; as drilling ſo greatly facilitates the cleaning of the land, and is a real ſaving in many other reſpects. This crop, if ſuffered to ſtand till ripe and fit for pulling, will be from ten to twelve feet high.

As to the mode of preparing hemp after the ſeeds are thraſhed out of the heads, the management is very ſimilar to that of flax. The ſtalks are laid up in bundles, and ſteeped in a pond of ſtanding water—the cleaner the water, the better; they are faſtened to poles, and left to ſoak about a fortnight, till you find the ſubſtance of the ſtalk almoſt rotten: the bundles are then taken out and well dried.

When hemp has been well ſoaked and dried, it is bruiſed by ſmall quantities on blocks, with beetles

beetles or large mallets: the bullen, which is the inward ſubſtance of the ſtem, flies off in ſhivers, by the force of the blows; and nothing remains in the hands of the beater but the thin bark in large threads, through the whole length of the ſtem. Theſe parcels of threads are afterwards hung on a perpendicular board, and bruiſed with a wooden beetle, to beat out ſuch little ſtraws as may remain of the bullen. All the groſs parts are now ſeparated from the ſtem, and the threads of the bark receive their perfection from the comb or hatchel.

SECTION LXVIII.

Burn-baking, with Experiments thereon.

BURN-BAKING conſiſts in burning earth of any kind that will burn to about half the conſiſtency of a brick. Clay ſeems fitteſt for this purpoſe. The operation is very ſimple: let a fire be made of any combuſtible you pleaſe. Where coals are ſcarce and dear, wood of any kind will do; but the roots of oaks, or any hard

hard wood, are beſt. When the fire burns ſufficiently ſtrong, clay muſt be carefully and gradually laid on it, taking care not to ſmother it. When the clay becomes ignited, lay on more, and it will of itſelf continue to burn without any additional fuel. A free circulation of air being abſolutely neceſſary, the fire ſhould face the wind: and it muſt be attended night and day, as the ſun or rain would extinguiſh it.

The expence, at preſent, of burning fifty cart-loads of clay, which is ſufficient for one acre, is as follows:

A tun of coals	£. 0	15	0
Wages of a man, fourteen days, at 2*s.* per day	1	8	0
Cartage after it is burnt	1	5	8
Total expences	£. 3	8	8

Where the clay is prepared, women and children, with a man to ſuperintend them, may be employed to light and keep up the fires.—Thus very large quantities might be burnt at a trifling expence.

As

As moſt luxuriant crops grow on the ſpots where the fires had been, the more ground is burnt over, the better. Where ant-hills and ſward are ploughed for that purpoſe, the fires ſhould be kindled in rows; and by croſs-ploughing the ſoil may afterwards be intermixed and made more equal. There are many kinds of land in the kingdom that might be improved by this method; particularly ſour poor clay ſoil, ſuch as abounds about Stamford and Grantham in Lincolnſhire, which, without being meliorated by art, will not produce an abundant crop when firſt ploughed up. The improvement of ſuch land ſhould be undertaken in ſummer, when the weather is dry. The ſurface and ant-hills muſt be ploughed, and burnt on the ground, and the aſhes ſpread over it. This is a good preparation for wheat or rape to ſtand for ſeed; as either of theſe crops will give ſufficient time for the operation.—The following is a profitable rotation of crops after burn-baking: firſt year, rape; ſecond year, wheat; third year, beans or peas drilled; fourth year, barley or wheat; fifth year, clover; ſixth year, wheat; ſeventh year, fallow and

drilled

drilled turnips; eighth year, barley and graſs-ſeeds. Now the land will be in a proper ſtate for graſs again; the ſoil having been pulveriſed, and improved to a greater degree than by any method yet practiſed. The refuſe of the two firſt years' crops, prepared according to my directions, will have furniſhed a ſufficient quantity of manure to be put into the drills with the beans or peas; and the crop of peas or beans and of barley, a ſufficient quantity to be worked up into a compoſt to be laid on the clover in autumn, after the barley is reaped. This will have inſured a good crop of clover, and of wheat after it; and the manure ariſing from the clover and wheat laid in the drills with the turnips will have promoted the growth of them and of the barley. From the barley-ſtraw a compoſt ſhould be prepared, and laid upon the graſs as a top-dreſſing. This ſhould be done, after depaſturing it the firſt ſummer with ſheep, &c. in the autumn, when the ſeeds have fallen from the firſt year's produce. Spread the manure over the land and buſh-harrow it: but permit no ſheep or cattle to go upon it, until in the ſpring the young graſs ſpringing from the

the ſeed that had fallen in autumn ſhall have ſufficiently taken root; for as clayey land, after it has been ploughed, does not eaſily reproduce ſward, every poſſible encouragement muſt be given it.

The aſhes being ſpread on the land after burn-baking, the lumps ſhould be pulveriſed before ploughing. The leaſt expenſive method of doing this is with a roller, and with a buſh-harrow, or a heavy gate with thorns interwoven into the bars, which is drawn over the land after it has been broken with the roller. If, after rolling and harrowing the firſt time, the ſoil be not fine enough, repeat the operation, till the pulveriſation be complete; or great loſſes may enſue, as little or no vegetation can be ſuſtained by a large lump like a brick.

In burn-baking clay, as in burning ſods, the fire ſhould not blaze, but ſmother ſlowly, as the aſhes thus procured are of a better quality, there being no exhalation from them.

When clay-land has been ploughed for ſome time, and impoveriſhed, it is apt to crack and ſet in dry weather ſo as in a great meaſure to prevent vegetation. By burning ſuch clay, the

ſoil would be enriched, and its bad qualities conſiderably diminiſhed.

Sand is the only ſoil that will not burn; ſand therefore cannot receive any improvement from burn-baking, except by burning clay and carrying it to a ſandy field. But I am of opinion that clay in its raw ſtate would be of more laſting benefit to ſuch ſoil.

Clay where ruſhes grow may be worked to very great advantage by burn-baking. Where ſwath or ant-hills are not to be had, clay taken from the bottom of ditches or grips may be uſed.

Moorland would raiſe a very large proportion of aſhes, which at an eaſy expence might be carried to clay-land, and uſed as manure in drill-crops. But where clay can be procured, it would be of great utility to burn it, and lay it on moor-land as manure for drill-crops; as, when ſuch a mode of culture is adopted, abundant crops are raiſed with ſo much leſs of every ſort of dreſſing.

To ſave the expence of breaſt-ploughing, or paring by men, the clay, &c. for burning may be ploughed up with the common plough, as there

there need be no fear of burning too much of the ſoil. The expence indeed of burning a very large quantity is greater: but the farmer would be amply reimburſed by the abundance of the produce. I know a gentleman who ploughed a field as deep as the plough uſually goes for a crop, and burned the whole; and a moſt luxuriant crop of barley grew upon it—ſo much ſo that on the ſites of the fires there was ten times too much.

The ſort of plough proper for making land ready for burn-baking is the Raucliffe plough, uſed in the low and marſhy parts of Yorkſhire to pare land, inſtead of breaſt-paring by men. It is uſual for men to do this with this ſort of plough, and find their own horſes, at 4*s*. 6*d*. per acre; but where ant-hills abound, it would require a ſtronger team, and therefore coſt more money. Oxen would do this work very well; for, by going ſlow, they give the man an opportunity to plough with greater deliberation. The ploughs upon ruſhy, haſſocky land have wheel-coulters, which ſteady it much, and in a great meaſure prevent its going different depths: but the wheel-coulter cannot be applied where large ant-hills or ſtones are in the land.

Some

Some years ago I tried an experiment on land intended for graſs, by burn-baking without ploughing it: but it did not anſwer, probably from the ſoil's not being pulveriſed and mixed.

Land once fertilized by burn-baking may ever after be kept in good condition, by returning upon it the manure ariſing from the luxuriant crops.

As the practice of burn-baking is new in many parts, it may not be amiſs to make a calculation of the expence and profit from one acre.

Expence for Eight Years.				*Profit for Eight Years.*			
Firſt Year, RAPE.							
	£.	s.	d.		£.	s.	d.
To one acre ploughing	0	5	0	By one half laſt of ſeed	15	0	0
Burning	0	10	0				
Spreading, rolling, &c.	0	3	0				
Ploughing, and ſowing with rape-ſeed, &c.	0	8	0				
Reaping and thraſhing	0	10	0				
Rent and aſſeſſments	1	10	0				
	£.3	6	0		£.15	0	0

Brought over	£.	3	6	0	Brought over	£. 15	0	0
Second Year, WHEAT.								
To leading the ſtraw & clearing the ſtubble	£.	0	5	0	By four quarters of wheat at 2*l.* 8*s.*	£. 9	12	0
Ploughing and harrowing		0	7	6	Straw		1	0
Seed-wheat, three buſhels		0	18	0				
Reaping and thraſhing		0	18	0				
Rent and aſſeſſments		1	10	0				
	£.	3	18	6		£. 10	12	0
Third Year, PEAS.								
Mowing ſtubble, leading, &c.		0	5	0	Four quarters of peas at 2l. per quarter		8	0
Preparing for peas, as before deſcribed		0	10	0	Straw		1	0
Four loads of manure and leading, ſpreading, &c.		2	0	0				
Peas for ſeed		1	0	0				
Managing in the drills		0	6	9				
Reaping and thraſhing		0	6	0				
Rent and aſſeſſments		1	10	0				
	£	5	17	9		£. 9	0	0
	£.	13	2	3		£. 34	12	0

Brought over	£.	13	2	3	Brought over	£.	34	12	0
Fourth Year, BARLEY.									
Scarifying, ploughing, harrowing, &c.	0	10	0		Four quarters of barley, at 2*l.* 5*s.* per quarter	9	0	0
Seed barley, four bushels	0	12	6		Straw	1	0	0
Mowing, leading, thrashing, &c.	0	10	0					
Rent and assessments	1	10	0					
Clover seed, 20*lb.*	0	13	4					
	£.	3	15	10		£.	10	0	0
Fifth Year, CLOVER.									
To mowing, leading, &c.	0	10	0		By two tons of hay	6	0	0
Rent and assessments	1	10	0		Herbage	0	10	0
	£.	2	0	0		£.	6	10	0
Sixth Year, WHEAT.									
Ploughing & harrowing	0	7	6		Four quarters of wheat, at 2*l.* 8*s.* per quarter	9	12	0
Three bushels of wheat, for seed	0	18	0		Straw	1	0	0
Rent and assessments	1	10	0					
Harvesting, thrashing, &c.	0	18	0					
	£.	3	13	6		£.	10	12	0
	£.	22	11	7		£.	61	14	0

Brought over	£.	22	11	7	Brought over £.	61 14 0
Seventh Year, TURNIPS.						
Mowing ſtubble, leading, &c.		0	5	0	Turnips	3 10 0
Preparing for turnips in drills		0	17	6		
Six loads of manure, leading, &c. putting in the drills		3	0	0		
Rent and aſſeſſments		1	10	0		
Cleaning the turnips, hoeing, &c.		0	6	9		
	£.	5	19	3	£.	3 10 0
Eighth Year, BARLEY.					By four quarters of barley, at 1*l.* 5*s.* per qr.	5 0 0
To ploughing, &c.		0	7	6	Straw	1 0 0
Seed, four buſhels,		0	12	6		
Reaping, &c.		0	10	0		
Rent and aſſeſſments		1	10	0		
Seeds, one ſack of rye-graſs, ten lb. of trefoil, ten lb. of white-clover		1	7	6		
	£.	4	7	6	£.	6 0 0
	£.	32	18	4		
Balance		38	5	8		
	£.	71	4	0	£.	71 4 0

In the above calculation I have charged 1*l.* 10*s.* for rent and aſſeſſment. This is more than the cold clay ſoil about Grantham could at preſent pay. It is uſed to breed ſheep upon, and cannot keep above a ewe an acre, with a lamb in ſummer. The whole profit ariſes from the lamb and wool, which does not exceed 1*l.* per acre, with an addition of 2*s.* 6*d.* per acre for the paſturing of a young beaſt in the ſummer.

SECTION LXIX.

A cheap and ready Method of rendering Land, which has had large Timber upon it, ready for the Plough—far preferable to grubbing or ſtubbing.

TO make the land on which timber trees have ſtood ready for the plough, it has hitherto been the cuſtom to dig the roots up; which by ſome is called ſtubbing or grubbing them. This practice can never anſwer, unleſs in ſuch places where coals are ſo dear that labourers are willing to dig up roots for the ſake of the fuel; and even in that caſe the taking out the root leaves

leaves a chaſm in the ground, which requires filling up with ſoil, and then becomes a ſwamp for a conſiderable length of time.

There have been ſeveral machines invented for the purpoſe of drawing roots out of the ground whole. But ſuch machines are liable to many objections; they are very expenſive in the conſtruction, troubleſome to move and fix, and, on account of the great purchaſe required, are very ſubject to be broken. Beſides, by tearing up a root, a machine makes a greater chaſm than by digging it; and, as is very often the caſe, if any thriving timber ſtands near that which hath been felled, ſuch timber runs the riſk of being ſpoiled by the violence of the machine. I knew a gentleman who uſed to blow his roots to pieces in the ground with gunpowder; but he often miſſed his intention, as the powder frequently forced through ſome weak part in the exploſion; and I never thought him a great gainer by the practice, though fuel is exceſſively dear in his neighbourhood.

My method is as follows: When the tree is felled, I leave a ſmall quantity of timber in the ſeat or ſtool of the tree, and in that part make a

fire with any kind of rubbiſh, and burn the ſtump in ſuch a manner that you may take up the ſide fangs with little trouble or expence; ſo that a plough may paſs over the part. And when the harrows go over the place, they will intermix earth enough amongſt the aſhes to make that part capable of bearing crops. The roots will rot in a ſhort time, ſo as not to cauſe a waſte of land.

If roots lie in graſs fields, pare ſome ſods round the roots, and make a large fire of rubbiſh and ſods. Aſhes of ſods retain heat much longer than thoſe made from boughs of trees, &c.

SECTION LXX.

Neceſſary Precautions in the Treatment of Sheep to prevent the Rot, and pointing out the Cauſe of that fatal Diſeaſe.

THERE are various opinions concerning the cauſes of the rot. It generally prevails much in very wet ſeaſons: over-moiſt paſtures will

will occaſion it; and there is ſome land not ſo moiſt that will produce it; but I am fully convinced that there will be found ſwamps or wet holes in ſuch land.

It is well known that ſheep, by being moved to a market or fair, have caught the rot in one night. As the diſeaſe is not contagious, this muſt have ariſen from feeding upon particular ſpecies of graſs, infected with an egg on it or ſomething of that kind; and I am inclined to think this to be the caſe from the following circumſtances: A farmer, in the neighbourhood of Wragby, in the county of Lincoln, took twenty ſhearling wethers to that fair, and left ſix ſheep behind in their old paſture. The ſcore of ſheep ſent to the fair were not ſold, conſequently were brought back, and returned into the field where the ſix had been left. Every one of the ſcore which had been taken to the fair died of the rot within the courſe of the winter; but the ſix left behind all lived, and did well. There could have been no miſtake with reſpect to this fact; as the ſheep ſent to the fair had been marked in a particular manner, and very differently from the remaining ſix.

Another

Another ſimilar inſtance corroborates the above opinion: A ſheep being lamed in returning from Burgh fair, his remaining companions were ſuffered to range in the common until a cart was got to take him in; they all died rotten, and he remained perfectly ſound.

I once had ten ewes ſent me from Northumberland. After I had had them ſome weeks, one of them appeared to be drooping: it was immediately killed; and on examining the liver minutely, I obſerved a dark bloody ſpot with a hole, in which ſomething ſeemed to be alive.—The hole appeared as large as half a middling-ſized walnut ſhell. I carefully cut off that part of the liver, and laid it on a board in a light place, and obſerved a number of ſmall flowks hard at work. I then got a magnifying glaſs, by the help of which I could more plainly diſtinguiſh the little animals, which were friſking about like fiſh in a pool on a fine ſummer's day. Some of them ſeemed feeding very heartily on the liver.

Soon afterwards I perceived the remaining nine ewes to be diſordered, but not ſo much as to be entirely off their food. I killed another,

and

and found the flowks had increaſed in ſize, and that they had penetrated much further into the liver. Some time afterwards, I killed another, and found the flowks to be ſtill larger, and to have entered deeper into the liver. I thought it impoſſible to ſave any of them, being fully perſuaded they would all die rotten.

I gave each of the ſurviving ewes two table-ſpoonfuls of ſpirit of turpentine. In the winter one died, two more were very badly chokered, and very weak; two were indifferent, but little chokered; and two of them ailed nothing to all appearance. All the ſix ewes brought up their lambs very well, and four of them were very fat in the ſummer: the two which had been ſo much chokered were very good mutton: but, when killed, they all had flowks; and the two which were ſo much chokered had by far the greateſt number.

The flowks prey ſo much on the ſubſtance of the liver, and introduce themſelves ſo deeply into the numerous blood-veſſels of it, as to change the colour of the blood, and reduce almoſt the whole of it to a thin watery ſerum; depriving the animal of the principal ſupport of life,

life, and deſtroying that ſource of nouriſhment ſo abſolutely neceſſary to be diſtributed pure through the whole ſyſtem. Blood in the ſoundeſt ſtate is ſuppoſed to contain five parts in ſix of water; and when theſe ravenous flowks have fed for a length of time on the moſt ſolid part, as ſheep muſt hold down their heads to feed, the watery ſerum ſettles underneath the chaps, and forms what we call a choker.

When the flowks have been ſome time in the liver, and have become large, they will form cells for themſelves, around which the parts will be hard or callous; and the whole liver will become a concretion of knots and lumps. When you kill a ſheep of this kind, the liver will appear like a lump of congealed blood, the blood-veſſels will be found to be inhabited by a numerous family, the flowk will be large and lively; and in the dwellings they have formed for themſelves you will diſcover a yellow matter, which I take to be their excrement.

Notwithſtanding the loſs of blood which ſheep troubled with this diſorder muſt certainly ſuffer, I have known many, that, after being

much

much reduced in fleſh, have got through the winter, fed very well in the ſpring, and lived many years.

In the rot, as in every other diſeaſe, there will be a greater chance of obtaining a cure, if you attack it in time, and endeavour to ſtop its progreſs. Therefore, when, either fom the extraordinary wetneſs of the ſeaſon, or from any other cauſe, a ſuſpicion ariſes that your ſheep are infected, you will do well to examine them with the greateſt care; and by the following ſigns you may decide to a certainty whether they are diſeaſed. Look under the upper eye-lid; and if the part appears white, and the veins ſeem to have little or no blood in them, you may reſt aſſured they are affected, and that the ſheep has the rot, and will from thenceforth decreaſe in value.

If you kill a ſheep and boil the liver, and it diſſolve and boil away, it is a certain ſign of the diſorder having taken place; and the ſooner you diſpoſe of the ſheep the better.

People in general are prejudiced againſt mutton, if they ſuppoſe the ſheep to have had but a touch of the rot; and the Jews are more

ſcrupulous

ſcrupulous by far in this reſpect than Chriſtians: but I do not think the fleſh unwholeſome. It has indeed leſs gravy, and is of a whiter colour than ſound mutton, which is owing no doubt to the loſs of blood; for, in order to render veal white and dry, we bleed the calf frequently.

A ſheep, though infected with the rot, may be fat: but both fleſh and fat will weigh leſs in proportion to the bulk.

This diſeaſe is not ſo eaſily cured as prevented: I think the prevention very eaſy. Were lands properly drained, they would very ſeldom rot ſheep; for though water of itſelf will not rot ſheep, yet over-moiſt land breeds ſomething that will. On dry healthy land ſheep are rarely troubled with the rot. In ſalt-marſhes, though abounding in moiſture, this diſeaſe is not to be found. On clayey ſoil, which will retain rain a conſiderable time after it falls, the ſheep are very ſubject to the rot; for the animalcules we call flowks are moſt probably generated in the little ſtagnated pools of water, are ſwallowed in embryo by the ſheep, and get nouriſhment by feeding on the liver.

In

In wet ſeaſons, to guard againſt the rot, let there be plenty of graſs in your paſtures, and ſuffer no horſes to feed among the ſheep.

Sheep never contract the rot in froſty weather. If the rot were owing only to wet, it would attack ſheep more frequently in winter than ſummer: but they never contract it after the froſt ſets in. It generally makes its appearance about the latter end of June.

There have been inſtances of the rot taking ſheep at Chriſtmas: but it has been in a ſeaſon remarkably open and wet. Moſt open commons will rot ſheep: they have deſtroyed thouſands; whereas, had they been encloſed and cultivated, they would have been of public advantage.

SECTION LXXI.

An effectual Remedy for Cattle ſtaling Blood: with ſeveral Remedies for other Diſorders to which they are liable.

STALING of blood, or, as ſome term it, the *bad-water*, frequently proceeds from a change of paſture. The land it prevails upon is generally of a poor nature, and ſuch as produces whins. The diſorder commonly makes its appearance in ſpring.

Before I took upon me to doctor my own beaſts, I have known ſeveral die with this diſorder. When a beaſt was taken ill, my cuſtom was immediately to ſend away for a farrier called a cow-doctor; and I thought it my duty ſo to do. But a worthy old gentleman, a phyſician who attended my family, ſoon convinced me of the ignorance of the claſs of men called cow-doctors, and the very improper treatment they preſcribed for their mute patients.

There are ſome, who from their education and profeſſion give us to hope a little more ſci-

ence

ence than is to be expected from the mere cow-doctors, but who are not a jot behind them sometimes in negligence and ignorance.

The method I here prescribe I have used for some years, and have never known it fail of curing the disorder. My first trial was upon a valuable cow, whom two farriers had practised upon without success. She was so bad as not to be able to rise without help. I took a large handful of nettles, which were boiled gently in two quarts of water until the liquor was diminished one half by evaporation. As soon as this liquor was sufficiently cool, I gave it to the cow, and immediately after washed it down with a quart of chamber-lie in which a handful of common salt had been mixed. This medicine operated so as to change the colour of the water in about three hours: the cow had a free passage; which is the principal thing to be obtained. I am convinced many die for want of it. In less than a week she was perfectly cured.

This remedy, the reader will own, is very simple; and I can assure him I have never yet known it to fail. Salt dissolved in warm water, and given to the animal, will soon purge gently:

but

but if the caſe ſhould prove obſtinate, it will be proper to give a clyſter with plenty of ſalt in it, which will ſoften and quickly bring away the indurated fæces. Some farriers are very fond of preſcribing caſtor oil for this diſtemper, but I never found it anſwer ſo well as my remedy.

There is another diſorder to which cattle are ſubject, called the *tail-worm*, and numbers die of it. When a beaſt is attacked by this diſorder, he finds great difficulty in riſing from the ground; and if the diſorder is neglected until it becomes violent, he is unable to riſe at all when once down. Some attribute this diſeaſe to the beaſt having been ſtricken by lightning, or think the beaſt has broken its back. Both fat and lean beaſts are liable to this diſorder, and the fat beaſt is not perceived to decreaſe much in fleſh until the diſorder is ſo increaſed as to prevent him from riſing; and in ſome caſes, where the progreſſion of the diſeaſe is ſlow, it will be a long time before that happens. A careful man will eaſily diſcover by theſe ſymptoms when a beaſt is attacked by the diſorder: he will make frequent attempts to

riſe,

riſe, and appear in pain; he will drop down behind, before he is half riſen. You muſt then examine his tail near the tip or bottom, and by pinching or holding it up you will find the bone entirely waſted; which ſo much affects the ſpine of the back-bone, and cauſes ſuch a weakneſs in it, as to prevent the animal from riſing.

If you apply a remedy in time, the diſorder is eaſily and certainly cured. My method is to amputate about two or three inches of the tail, according to the ſtage of the diſorder. You will find the bone, as the farriers, who have no knowledge of the cauſe of this diſorder, expreſs it, "eaten in two," that is, entirely decayed: and this they tell you has been occaſioned by a worm feeding upon the bone. But amongſt the great number of tails I have cut, I never yet, after the moſt diligent ſearch, could diſcover one of the worms they talk ſo much of. It would be more juſt, in my opinion, to attribute this diſorder to a caries of the internal part of the bone. Amputation is the readieſt, ſafeſt, and ſureſt cure. No internal medicine is neceſſary. You need only be cautious that the

tail

tail is cut off a little higher than the diſeaſed part, and you will ſoon find your beaſt recover. I have known a beaſt, which for ſeveral days had been unable to get up, riſe in two days after having part of its tail cut off, and thrive.

Some farriers will cut open the tail, and apply ſalt and onion to bring about a cure. I have heard of beaſts hung up in ſlings, and ſtuffed with drinks day after day, until they have died. The ingenious farrier will tell you it is the *pif* or pith of the back that is affected; but I ſay the caries begins near the extremity of the tail. Take away the cauſe, the effect will ceaſe. I am, like Doctor Laſt, for a radical cure, which is undoubtedly beſt effected by lopping of the rotten part.

Another diſorder very common amongſt beaſts is the *foul in the foot*. This is very painful, and of courſe injurious to the feeding beaſt; for neither man nor beaſt thrives much whilſt ſuffering great pain. It is moſt commonly the effect of cold, and ſhews itſelf firſt in a tumour, or ſwelling betwixt the claws of the hoof, which is very much inflamed. A poultice would doubtleſs be a good remedy; but

but it is impoſſible to apply it properly. Sometimes the ſwellings are hard or ſcirrhous. In the firſt inſtance the cure is eaſily perfected; in the ſecond, it is more difficult to be accompliſhed: but nine times out of ten this diſorder would paſs off with the ſame remedy as is found ſo uſeful when the gout attacks the human frame, I mean patience, which, when the beaſt is in queſtion, muſt be practiſed by the patient's owner.

Thoſe who have faith in charms follow the beaſt along the paſture, obſerve where he treads, then cut up the ſod, and either turn the ſward ſide downwards, or hang it on a hedge; and the owner waits with patience for the cure of his beaſt.

Some apply tar and quicklime to haſten the ſuppuration of the tumour, which they rub round with a hair rope to promote the diſcharge with expedition. The beſt method of treating this diſorder is, if the tumour becomes ripe, to open it with a ſharp-pointed penknife, to cleanſe the wound thoroughly, give it a common dreſſing, and let it heal gradually. But that operation is ſeldom neceſſary.

The

The *gargle* in a cow's udder is a diſorder frequently met with, and ariſes from a congeſtion of milk in the udder: but an obſerving hind or dairy-maid will, by taking proper meaſures in time, prevent this diſorder from being attended with bad conſequences. The firſt ſigns of it are, one or more of the paps and part of the udder appearing unnaturally diſtended, and violently red or inflamed. It is then neceſſary to draw all the milk out of the bag, and to rub the part with maſh-mallows ointment twice a-day. But if the diſorder has been neglected until the milk has become much inſpiſſated or fettered, you muſt anoint your hand plentifully with hogs-lard, gooſe-greaſe, or linſeed-oil, and rub or chafe the pap and every part of the udder inflamed. Some boil the leaves of elder in milk to a pulp, and make an ointment by the addition of hogs-lard, with which they anoint the parts, rubbing it well in. Houſe-leek and white-lilly root are very good; but any thing which ſoftens the part will anſwer the purpoſe. The chafing and rubbing alone is in moſt caſes ſufficient, if you take care to draw the milk regularly morning and evening. Farriers

Farriers or cow-doctors in this diſorder generally preſcribe phyſic for the cow to keep her body cool; and if the milk has much of a mucous thickneſs in it, gentle purging may not be unneceſſary. But warm fomentations, or the application of the ointment with the friction or long rubbing with the hand, will be found the moſt certain cure. This gargle diſorder chiefly attacks cows: but I have likewiſe known an ox gargled.

SECTION LXXIII.

Several approved Remedies for the Cure of Diſorders in Horſes.

THE horſe is ſubject to almoſt as great a variety of diſeaſes as mankind; and amongſt the moſt painful common to both may be reckoned the colic, or as ſome term it the cholic, and others the gripes. This is not only a painful, but is often a very fatal diſorder to horſes. There are many cauſes to which it may owe its origin: but the moſt frequent is the reten-

tion and induration of the fæces in the large inteſtines, and ſometimes in the ſmall ones.—Sometimes it proceeds from the horſe, when heated by exerciſe, drinking too freely of hard water. The moſt approved remedy in both caſes, is a good doſe of gin the moment any ſymptoms of the diſorder appear. I have given a pint of gin at a draught; and in a few minutes afterwards have repeated the ſame doſe. When the horſe has been very ill, I have given a whole quart, in which I have infuſed an ounce of pepper. It is likewiſe proper to rake the horſe, which is done by anointing the hand with hogs-lard or oil, thruſting it into the fundament of the horſe, and raking out all the dung you can get at. Repeat this operation, and every time take care to anoint your hand as before, after which give the horſe a clyſter of the emollient kind. This method has ſucceeded in moſt inſtances.

I had a ſtrong mare of the draught kind, which had rather too much ſpirit. She was much ſubject to the colic; for ſhe was ſo fond of her work, and ſo violent, that ſhe would not ſtop to dung; by which means the fæces were

too

too long retained, and by preſſing on the neck of the bladder cauſed a difficulty of ſtaling. I uſed to cure her by raking and clyſters; though at times ſhe was exceeding bad. Opening a vein is frequently of ſervice in the colic.

Mares caſting their foals is another common accident; which is prevented by taking ſome pigeons' feathers, and laying them on a pan of hot coals, ſo that they may ſmoke but not blaze, and holding theſe ſmoking feathers under the mare's noſtrils for eight or ten minutes. I never knew this fail. Before I made uſe of pigeons' feathers, I had ſix mares in one ſtable, all with foal: four of them, one after another, caſt their foals; though, when the accident had happened to the firſt mare, every method then in uſe was put in practice, ſuch as burning pitch and tar in the ſtable, and continued until three more caſt their foals. The two remaining mares were ſmoked with pigeons' feathers as deſcribed, and they brought their foals, and did very well. This as a preventative ſhould be applied at the latter end of the year. I generally do it twice, the beginning of October and the beginning of November. I never knew

a mare

a mare caſt her foal when this preventative was uſed. At the time the mare is about to caſt her foal, take the craw of a fowl, and cram it down her throat, and it will prevent the abortion.

Greaſy heels is another diſorder to which horſes are very liable: but it is a diſorder that ſcarcely ever is to be found but when brought on by neglect of the perſon who has the care of them. So long as the horſe runs in the field without being uſed, he will not have greaſy heels. This diſorder is frequently brought on by giving the horſe too much work and too little corn, and likewiſe neglecting to give him proper cleaning. By being over-worked and not kept in heart by a ſufficient quantity of hard meat, the horſe is reduced in fleſh, his blood becomes weak and ſizy, and abounds with a thin watery ſerum, which falls into his legs. In conſequence of the legs ſwelling, the ſkin becomes diſtended, and is exceedingly painful; the pain prevents the horſe from lying down; the ſwelling of courſe increaſes, until it breaks forth in filthy ulcers, whence iſſues a putrid or ſtinking matter. I know, indeed, that ſome horſes which run in ſtage-

coaches

coaches and are high fed with corn, will have ſwelled heels; but that moſtly is a different diſorder from what is called a greaſy heel, and generally proceeds from the alternate extremes of heat and cold, which engender humours and corrupt the maſs of the blood. However, in either of theſe caſes, the firſt ſtep neceſſary is to procure a free diſcharge of the eroding matter; for, if it is ſuffered to ſtagnate till it becomes acrid, and is abſorbed into the blood, the cure becomes extremely difficult, if not impoſſible. A very ſmall portion ſo abſorbed will raiſe a putrid fever in the horſe, as ſurely as yeaſt would cauſe a fermentation in a tub of wort.

If this diſorder is recent, the cure is eaſy; for, ſuppoſing the heels only cracked and but little ſwelled, it is ſufficient to waſh them with ſoft ſoap and warm water, and give him gentle exerciſe, and plenty of corn and malt maſhes; and if any fungous or proud fleſh is formed, you may apply a little verdigriſe mixed with honey; or, what will anſwer the purpoſe with much leſs trouble to yourſelf, get ſome blue vitriol, pound it fine, and put it on the part.

It

It is always to be remembered that cleanlineſs and care will promote a ſpeedy cure: therefore let the horſe's heels be rubbed out with warm water and ſoft ſoap; and let not the groom or horſe-keeper be afraid of dedicating a couple of hours labour to preſſing and rubbing the legs and heels of the horſe; for by ſuch friction he will promote the circulation of the blood and juices, and gain honour to himſelf by the fineneſs of his horſe's legs. During the courſe of this cure, it will be neceſſary, if you want your horſe for immediate uſe, to give him plenty of corn. I recommend four feeds of good oats, making one peck—or more if you chooſe, it will not injure the horſe—not forgetting to mix a quantity of chopped ſtraw with each feed, as heretofore recommended. This will cleanſe his bowels, as bruſhing does his ſkin, and anſwer much better than phyſic. If you do not want your horſe for uſe, let your man ride him out gently, morning and evening, upon ſome field or common, where he will not be ſubject to pick up much ſharp ſand or dirt; taking care not to waſh his legs with any thing greaſy, as the dirt will ſtick to it. Let him

him be walked only for an hour each time.—Fleſh will ſoon grow, and the greaſe will ſoon leave him.

But if this diſorder has by neglect been ſuffered to get to a conſiderable height, it would be highly dangerous to dry the ſores up at once. In this caſe we muſt promote ſuppuration by every means in our power, and endeavour to give a diſcharge to the virulent matter. After having firſt had the heels well waſhed with ſoft ſoap and water, apply a poultice of roaſted turnips. When you find the diſcharge has been ſufficient, and the pus or matter which has been brought away to be of a mild ſort, you may leave off the poultice, and, keeping the wounds perfectly clean, proceed to dry them up: and during the cure it will be proper to give the horſe hot maſhes of bran with nitre mixed, to give him warm water, moderate exerciſe, clean ſtable and ſtraw, and good dreſſing by a diligent and active groom. This diſorder I have already ſaid is brought on by the negligence of him who has the care of the horſe. I would therefore adviſe the maſter, upon the firſt appearance of the ſwelling, to

ſee

ſee him eat his corn, to ſee him well dreſſed, his legs rubbed with ſtraw and with the hands, after being clean waſhed with ſoft ſoap and water. The maſter muſt likewiſe take care that the horſe has his neceſſary exerciſe, and that his ſtraw and his ſtable be perfectly clean and comfortable; and the horſe will not want a doctor.

Horſes that have fed upon low land are liable to the greaſe; and ſuch feeding will alſo cauſe a diſorder which is called the feltrick; which is a tumour or ſwelling in the loweſt part of the abdomen or belly, and which, if you open it by making a ſmall inciſion in the ſkin, you will find to be full of a white watery matter. A horſe worth preſerving ought never to be put upon ſuch land; for if he eſcapes with life he is certain of injuring his conſtitution, and of being rendered unfit for hard exerciſe. I would not buy, at any price, a horſe that had been bred in the fens, or kept on low fenny or ſwampy land, let his figure be ever ſo good.—What I call marſh land is of a different nature from fenny land; eſpecially ſalt-marſh, which is by far the beſt paſture a horſe can go upon in ſummer. The feltrick is cured by foment-

ing

ing the part to ripen the tumour, by rowelling, and by plenty of good corn.

The canker in the horſe begins in his mouth. I have known it increaſe to that degree as to eat the tongue completely through. The only way of curing a canker is to deſtroy it at its firſt appearance. It may be known by the horſe chewing his food, and letting it drop out of his mouth again, and ſhewing a difficulty in ſwallowing. To cure it, mix bole armenic with ſome of the ſharpeſt white wine vinegar or alegar, add a little honey, and mix the whole up to the conſiſtence of cream. Take a ſtick, tie ſome tow round one end of it, and rub the part affected, which at that time will not perhaps be bigger than a pea: but you may rub all over the mouth by way of prevention. If you are early in this application, you will diſpel the tumour, and cure your horſe: but if you delay till it breaks forth all over his gums and tongue, it will require longer time to work a cure. The ſame application will cure the canker in any other part.

For bruiſes, cruſhes, or contuſions—I mean to ſpeak of ſimple contuſions only; for where

they are compound, that is, when the internal or bony parts are injured, better advice and aſſiſtance than I am able to give will be required. In fact, compound contuſions are for the moſt part of ſuch a nature, that a horſe is ſeldom good for much after he is ſuppoſed to be cured.

Fomentations or embrocations will cure contuſions, and diſpel tumours which ariſe in conſequence. There are a variety of ingredients that people uſe in fomentations and embrocations, which tend to the ſame end, and moſtly have the ſame effect. I make uſe of the following, which I have found to anſwer: Take a quantity of ſtale urine (if you have a tub in ſome convenient place to keep urine conſtantly by you, it will be found often uſeful), and, if in ſummer time, put ſome elder leaves in it; if in winter, the bark of the elder, ground-ivy leaves, groundſel, or houſe-leek. Chop them fine, and put them in an iron pot, and let the mixture gently ſtew for a ſufficient time to extract the juices from the herbs. Then add as much cow-dung as will ſtiffen the mixture ſufficiently to make it ſtick upon the part

when

when you apply it. The beſt way of uſing this, is to get a ſtick (an old broom-ſtick is as good as any thing), ſplit it at one end about ſix inches down, and in the cleft part ſlip in a piece of an old ſtocking, and tie it on tight: make the mixture boil (for which purpoſe you had better have a pan of coals in the ſtable); dip the ſtocking into it, and foment the diſeaſed part by dabbing on the place. The oftener this is repeated, the better. You need not be afraid of applying this fomentation too hot, or repeating it too often.

By perſiſting in fomenting the part, you will have ſymptoms of an approaching cure; between the fomentations a kind of dew will riſe on the hair—an indication of perſpiration, and of the ſpeedy termination of the diſorder. You will be cautious not to neglect repeating the fomentation very frequently; and you muſt keep the horſe well covered, particularly on the part affected, ſo that it be kept as warm as poſſible; for warmth will greatly aſſiſt the diſperſion of the tumour, and prevent the ſtagnation of the blood. By immediately

having

having recourſe to the remedy recommended above, you may often cure a ſimple contuſion within twenty-four hours.

If the contuſion is large, and an abſceſs is formed, it will be neceſſary to promote ſuppuration as ſpeedily as poſſible; and if the fomentation mentioned is not ſufficient to ripen the part, you may have recourſe to a poultice, if the contuſion is ſeated in a part on which you can eaſily bind it. The poultice may be put on in the night, and may be made of ale-grounds or ſtale beer, with wheat-bran and cow-dung. In general, however, the tumour will yield to the fomentation recommended above. If it break, and a white thick pus runs from the orifice, you muſt preſs the matter gently out with your hands, and clean the wound thoroughly with a bit of ſoft ſpunge. In all wounds, great care ſhould be taken to prevent freſh blood from riſing; as the air affects the part and retards the cure. Some will content themſelves with fomenting a bruiſe or contuſion twice or thrice in the ſpace of twenty-four hours: but by ſuch trifling you will neither diſpel it, nor, if a dangerous one, bring

bring it to a ſpeedy ſuppuration. You may in fact by ſuch means do more harm than good. I have ſeen ſome extraordinary cures by the above method; and when the horſe has been in extreme danger I have cauſed him to be attended night and day.

Rowelling is ſometimes very neceſſary to aſſiſt in diſcharging the foul humours, and prevent them overloading the part aggrieved. Rowelling in unſkilful hands is a dangerous operation. I knew a bungling fellow, who, determining to go deep enough, cut through the muſcles of the abdomen, and wounded the peritonæum or thin membrane, which covers the omentum or cawl: the horſe, which was a valuable one, died in conſequence. The way to rowel a horſe is to a make ſmall inciſion or ſlit juſt through the ſkin, about three or four inches above the part aggrieved; put in your finger, and work it round until you make room ſufficient between the fleſh and the ſkin to contain the leather rowel, which muſt be prepared in the manner following: Take a piece of thick tanned leather, ſuch as is uſed for ſoleing of ſhoes; cut it round, about

two

two inches diameter; make a hole in the middle, lap it with tow ſo as to cover the leather well, and dip it in ſpirit of turpentine. After you have introduced the rowel, ſtop up the hole in the ſkin with tow, dipped likewiſe in ſpirit of turpentine. It is adviſeable to tie a piece of ſtring, which you paſs through the hole in the leather, ſo that you may draw the rowel out at pleaſure; and it may be likewiſe neceſſary to tie a piece of ſtrong packthread round the leather part of the rowel, to pull it out with more certainty and eaſe, as the leather will ſwell much, and the orifice ſometimes becomes ſmall, and the edges get thick. There are ſeveral preparations which were uſed to dip the rowels in, ſuch as ſalt of lemon, &c.: but I never found any thing better for the purpoſe than ſpirit of turpentine; for that, in my opinion, will promote ſuppuration the ſooneſt. If the above inſtructions be attended to, there is no danger in rowelling: but it will be neceſſary to keep the horſe warm, to give him maſhes and plenty of corn, and his water warm. Nor muſt he be permitted to go into the cold air until the rowel begins to diſ-

charge:

charge: but when it diſcharges a thick kind of matter, the horſe may be worked gently without fear of injuring him. However, great care muſt be taken that the animal get not wet by rain or any accident, leſt it occaſion a cold.

In ſtrains of all kinds a horſe will be the better for moderate exerciſe; for, if the pain is violent, he will ſtand ſo much in one poſture as to run the hazard of contracting his ſinews in ſuch a manner as never to have the proper uſe of them afterwards. If the ſtrain happen in a part that can be poulticed, I am for applying one, though not the faſhion at preſent amongſt farriers or horſe-ſurgeons: but I know it to be proper, after bathing the part affected with brandy and vinegar two or three hours, eſpecially when an inflammation takes place: and yet I have ſeen farriers apply ſtrong oils; which is adding fuel to fire: and I am convinced, that, were you to apply the ſame pretended remedies to a horſe perfectly ſound, you would make him lame. The common method of treatment may anſwer the purpoſe of putting money into the farrier's pocket, as

a lame

a lame horſe is more profitable to him than a ſound one; for he is paid his journey, plaſter, bottle, &c. &c. I am for giving nature every chance of working for herſelf: but I think many of the medicines and applications which are uſed counteract nature when ſhe is diſpoſed to bring on a favourable criſis.

The proprietors of ſtage coaches, machines, &c. have occaſion for good horſes; but they ſometimes buy ſuch as are lame from ſome old ſore or accident: and I have known it happen, that a horſe who has been ſtrained, and ſold for a mere trifle, has run himſelf ſound in continually working the ſtage. I do not, however, recommend ſuch violent labour for the cure of a ſtrained horſe; though, to give ſuch the moderate exerciſe of the plough and harrow, is, in my opinion, more likely to effect a cure than all the internal medicines or external applications in uſe amongſt farriers.

Warbles are troubleſome ſometimes on a horſe's back under the ſaddle, and the ſooner they are diſperſed the better. If the part is much inflamed, and feels hot to the hand, take oil of vitriol, with an equal portion of hogs-

lard;

lard; ſimmer it over the fire for ſome time till it becomes an ointment, with which, when cold, rub the warble. You may ſafely uſe the horſe if you want him immediately. I never knew this fail effecting a cure.

For heat-blains under the ſaddle, apply ſalt and water, as ſoon as you come in from riding your horſe, and that will prevent them riſing.

SECTION LXXIV.

Cow-Graſs; Culture and Uſe.

COW-GRASS is a ſort of clover, and ſo like red clover as not to be eaſily diſtinguiſhable when not carefully compared. The ſeeds of both are much alike, but there is a great difference in reſpect to the quality of the graſſes. I have ſeen a much greater crop of cow-graſs on the ſame ſort of land, and in the ſame ſeaſon, than I ever did of red-clover. Cow-graſs will grow to very great length, and delights in a clayey ſoil. I have ſeen it riſe ſix feet high amongſt thorns, and whins or goſs.

I do not think cow-graſs of a very feeding nature. It is a later plant than red-clover, and ſheep do not like it ſo well. I have ſeen one ſide of a field ſown with cow-graſs, the other with clover: the ſheep ate the clover very bare, but left the cow-graſs, as if they diſliked the paſture:—at leaſt, they certainly preferred the clover. The culture of cow-graſs is the ſame as of red-clover.

SECTION LXXV.

Remarks on the Management of the Kitchen Garden. Advantage of the Plough in reſpect to Peas and Beans of all Sorts, Spinach, Cabbages, Carrots, Onions, Parſnips, &c.

BY the method I propoſe, an acre or any given quantity of land will produce in a more abundant manner any of the kitchen-garden vegetables, roots or plants; they will ſooner arrive at maturity, and be in every reſpect better in quality than by the cuſtomary method of gardening.

For

For trial, take an acre for peas. We will ſuppoſe the land to be in good condition, and to require only once ploughing, or once digging. The ploughing will coſt per acre 5*s.*; the harrowing, 1*s.* 6*d.*; drilling, 2*s.* 6*d.*; ſowing the peas, 4*d.* per acre; and the harrowing-in, 1*s.* 6*d.* It will be neceſſary to mould three times with the plough; twice, to kill the ſmall weeds; and once, to mould up the peas. The moulding to kill the weeds and afford a little earth, each time 1*s.* The third and laſt time of moulding we will eſtimate at 2*s.* per acre.—Theſe different ſums put together will make the expence to be 14*s.* 10*d.* per acre. Now in the common way the leaſt coſt is per acre, digging, 2*l.* 2*s.*; ſetting, 1*l.* 1*s.*; hoeing to kill the weeds, 4*s.*; moulding, 4*s.* if not 5*s.*; which will be 3*l.* 11*s.* or 3*l.* 12*s.* per acre.—The gardener attached to the old practice, will ſay, his method will produce better crops.—The following is a proof of the ſuperiority of mine: I had on the 25th day of May 1797 an acre and a half of peas in full bloom on my farm at Sprodborough, which for that ſituation was a novelty: they grew on an acre and a half

half of old going land, which was treated in the following manner: In the year 1794, potatoes; 1795, wheat; 1796, oats; 1797, peas; and manured with a compoſt as before deſcribed, in a cheap manner, not exceeding 2*s.* 6*d.* per load. Eight loads was the quantity laid on per acre; ſo that the whole of the land coſt but thirty ſhillings for the dreſſing. By the 10th of June they were fit to pull green for market, and they were univerſally allowed to be as abundant, and as fine a crop in every reſpect as had ever been ſeen on ſo ſmall a ſpot. If ſo good a crop can be procured from old going land in a farm, ſurely there can be little doubt of ſucceeding with the plough where land is enriched to gardening condition. The difference in expence is well worth attending to.

The old method, we ſay, will coſt per acre	£. 3	12	0
The new method	0	14	10
Saving by the new method	£. 2	17	2

I take

I take the price of land, ſeeds, &c. to be the ſame in both caſes: here, then, is a net profit of 2*l.* 17*s.* 2*d.* per acre, no deſpicable thing.—But there are other conſiderations independent of the firſt profit, which render my method ſtill more preferable to the old one. By the old method you muſt of neceſſity employ a number of labourers; a circumſtance always attended with trouble; for, unleſs the maſter follows them diligently, and watches them narrowly, he will often pay full price for having his work half done; and the vexation a good farmer muſt undergo from the frequent refractory behaviour of labourers certainly deſerves a place in the account. I had rather manage ten acres of land with horſes, and direct them myſelf, than three acres with men, and have the plague of following and watching them in the old method. My fatigue, I am ſure, would be much leſs with the dumb animals, even if we join aſſes to the number. Suppoſing I had determined to cultivate the ten acres myſelf, there will be ten days ploughing—drilling, five days—ſowing, one day—ploughing to kill weeds, three hours twice, and ſix hours the third and laſt time

time: this is exactly what my men do at present for me. We will call it eighteen days' work, and suppose the crop peas; but other garden-vegetables may be raised at the like expence, or cheaper: the land may be ploughed by horses, and harrowed by them, but not drilled; for we will have a small plough for this purpose which shall be drawn by an ass, which will answer for spinach, carrots, garden-turnips, &c.: as the drills ought to be only twelve inches asunder, a horse could not pass between the rows. The same plough with the ass may clean between the rows; for the plough and ass being the exact measure of the furrow, will clean the land they have made themselves, in a perfect manner; and the drills will be a proper space to walk in.

I attended my men to set with potatoes an acre of land where garden-beans were growing, and half an acre of them were formed for blossom, and the rest sufficiently advanced to bear moulding high in the rows. This was performed a few minutes within three hours in the following manner: Six children to drop the potatoes before the plough. One man to mind they

they dropped them regularly about eight inches aſunder, as alſo to ſerve the children ſufficiently with potatoes to fill their baſkets.—One man to attend the horſe in the plough. The expence was,

Six children, at *6d.* per day each	£. 0	3	0
Two men, at *2s.* ditto ditto	0	4	0
Horſe, at *3s.* ditto	0	3	0
	£. 0	10	0

Now, allowing nine hours to a day's work, and the total expence ten ſhillings, there will be three hours which the potatoes took in planting to be placed to that account, which will be a deduction of *3s. 4d.* from the beans, leaving the net charge upon that article per acre juſt as much as an honeſt attorney would charge a ſimple countryman for aſking him a queſtion, viz. *6s. 8d.*

It may perhaps be objected, that this ſcheme would deprive a number of poor people, who now work in the gardens, of a livelihood;—for, by adopting the method, thoſe of affluent fortunes would not have occaſion to employ

employ ſuch a number of women in ſummer as weeders, nor ſo many men in winter as labourers. But remove the man with his wife and children into the field, and make a garden of that; then the man with half a dozen children, inſtead of being poor, will ſoon find himſelf at eaſe.

I have raiſed not only a double crop of potatoes and beans, but likewiſe a double crop of potatoes and cabbages, by the plough, with a little aſſiſtance from the ſpade. As the manure lies between cabbage and cabbage, it would indeed be impoſſible to put the potatoe in a proper place without the ſpade; and as there will always be ſome runners in cabbages, this method fills up the vacancy in a proper manner, and is highly profitable. I began cutting the cabbages in May; they were all cut by the time the potatoes were fit to earth. The expence of ſetting an acre of potatoes amongſt cabbages is 7*s.* per acre. A man, his wife, with a boy or girl, will ſet one day with another better than half an acre. The man digs the hole, the child drops in the potatoe, the wife with a hoe covers it with earth, and at the

ſame

ſame time cuts up any weeds that may be growing between the plants. The expence will be for half an acre :

	£.		
The man one day, at 2*s.*	0	2	0
The woman one ditto, at 1*s.*	0	1	0
The child, one ditto, at 6*d.*	0	0	6
	£. 0	3	6

Which will be equal to 7*s.* per acre.

Carrots ſhould be ſown in drills : but you muſt reverſe the method preſcribed for turnips. Make the land ready with the plough, then level the ridges with a rake, and with a hoe make two drills, one on each ſide the ridge. In theſe drills ſow the carrot-ſeed, and rake the mould over it. Thus you have double ſoil, which will greatly add to the ſize and length of the carrots. Between each row of carrots you may on the top of the ridge ſow radiſhes or lettuces. When the carrots come up, you may with great eaſe hoe them : that done, betwixt each row you may plant the Savoy cabbage, or dwarf kidney beans. I am of opinion

you will have greater weight of carrots than if the land were all ſown with them broad-caſt. The cabbages or kidney beans will not at all injure the carrots, nor the carrots the other crops : and as the land will be prepared by the cleaning of the carrots, there will be no other expence but that of the ſeed or the plants. Another advantage attending ſowing the carrots as above, is, that inſtead of digging them up, in the expenſive mode at preſent practiſed, with ſpades or forks, you may plough the earth from them with the Rotherham plough, when they may without difficulty be pulled up, even by children.

Cucumbers, parſnips, &c. may be raiſed in the ſame way as above directed for the carrots.

SECTION

SECTION LXXVI.

Obſervations on Buck-Wheat.

BUCK-WHEAT in this country is moſtly uſed as a green crop. Some ſow it for the expreſs purpoſe of ploughing-in for manure; but ſuch practice is bad huſbandry, and I diſapprove of it much in any green crop; for, if a farmer has money, he muſt be an indifferent judge indeed of ſtock, if he cannot depaſture it with ſome cattle, that will pay better, and produce both more and better manure than ploughing-in the green crop. Therefore, I recommend buck-wheat, except ſuch as may be wanted for ſeed, to be eaten green in the fold. It will as a green crop bear ſowing later, and grow much quicker than any other ſort of plant for fodder, and by its quick growth ſmothers all weeds. It may be ſown after a crop of rye and tares, that have been ſown in the autumn, are eaten off; and the land will be greatly ameliorated, and ready for wheat in the

the proper time again. The buck-wheat may be ſown after a ſpring depaſturing on two years old ſeeds.

To thoſe gentlemen who have extenſive manors, and are deſirous of preſerving the game, but particularly pheaſants, buck-wheat will be found advantageous; for there is no grain whatever that pheaſants are fonder of. They will fly many miles from home to feed upon it.

Buck-wheat will grow on any ſoil, and ſucceed on a poor ſand and on a rich loam. On land nearly barren this grain may be ſown to advantage. The time of ſowing is from the beginning to nearly the end of June. Some foul land requires ploughing before winter, and treating as directed for the pea-fallow.—If ſubject to lie wet, grip and drain well; and clear the land of weeds by carting them to your reſervoir. Another ploughing and harrowing may be neceſſary before the ſowing in June. In Auguſt, when graſs fit for mowing is generally ſcarce, this crop, if eaten green, will afford excellent fodder for ſummer-folding of cattle. The quantity of ſeed required

to

to be ſown is from two to three buſhels per acre. The grain, when ripe, is good food for pigs, turkeys, and other kinds of poultry; but I hope never to ſee my countrymen reduced to the ſituation of the peaſants in Germany, who uſe it as a ſubſtitute for wheat.

Buck-wheat particularly ſuits blowing ſand, or any light ſoil; as it grows quicker, and produces a greater abundance of food for cattle than any other plant ſown ſo late in an equal time could.

SECTION LXXVII.

Obſervations on Rye, for Spring-eating by Cattle.

RYE is very beneficial, when ſown amongſt tares in the autumn; as a proper quantity will ſhelter the tares and draw them up. Rye is a hardy plant on land that ſuits it; and it will grow to a great length on ſuch land in leſs time in the ſpring than any thing I know of. Rye anſwers the ſame purpoſe for tares as ſticks or rods do for peas; and they may be eaten well

well together. It is likewiſe good where land is in condition and clean for ſpring-eating for ſheep, and to ſow turnips after. I recommend to ſow the rye and tares by the drill, for both forwarding the crop and cleaning the land.

SECTION LXXVIII.

Method of ſetting Quick-Hedges, and of plaſhing them.

THE beſt method of planting quick-hedges upon ſwarth land is under the cape ſod, which is done by lining out the intended ditch, and on the ſide you intend the quick to be planted let your bank be made. Therefore firſt with your ſpade ſet out your ditch, then lay down your quick upon the ſward you intend to cover; take the firſt ſod and turn it over out of the part you intend for the ditch upon the quick, ſo that the quick root will lie between two ſwards, and be prevented from ſtriking downwards; and if there be any good ſoil, the root receives the benefit of it, and will enjoy that moiſture it ſtands ſo much in need

need of from the ditch. Set the next ſod bank-wiſe, and another row of thorns, if two rows be required; and continue the bank in the ſame manner until the work is completed: this is not only the beſt, but it is the cheapeſt method in the firſt inſtance; it is likewiſe the leaſt expenſive to clean.

Sheep and lambs are deſtructive animals to quick; but if by accident they get into the ditch, they cannot ſo eaſily injure it as if it ſtood elevated on a bank between two. In ſome counties the common practice is to ſet quick on a narrow ridge or bank with a ditch on each ſide, by which means the beſt earth lies at the bottom, and the poor ſtony ſoil at top. In ſuch a ſituation it is wonderful to me that it grows at all: it is indeed hardly poſſible to take more effectual means of preventing the growth, unleſs they cut off the root. We muſt all know that the quick-thorn, like other plants, will vegetate beſt in ſuch ſoil as is moſt congenial to it; and we know quick delights in a good ſurface ſoil properly pulveriſed and manured, and that it is neceſſary it ſhould be conſtantly weeded and cut down within an inch of the ground

the

the February following your planting it, if you mean it to thrive. But, becauſe the weeding and taking care of the plants when young is attended with trouble and expence in the outſet, ſome content themſelves in general with ſimply planting the quick, and leaving it the chance of thriving in bad company, without conſidering that the old adage of "the firſt coſt being beſt," can never be better applied than in this inſtance; for the quick being properly nurtured and trained in infancy, will at a maturer age arrive at a perfect handſome hedge, and not only ſerve the purpoſe of a good fence, but, well managed, may pay the farmer for the trouble beſtowed upon it.

I ſee no reaſon why a hedge ſhould not pay intereſt for money laid out, as well as any other part of a farm. Suppoſe for inſtance, in valleys or ſuch ſituations where the land is good, plum-trees, apples, cherries or other fruits of the choiceſt ſorts were planted at intervals, inſtead of ſuffering the wild and almoſt uſeleſs ſort to grow; the expence would be trifling at firſt, the fences ſoon become a very valuable part of the farm, and add not a little to the ornamenting

namenting it. If I had land to incloſe, where I intended to plough continually, I would ſet the fences with the filberd or with the common wood-nut, which would produce a profitable crop of nuts.

In quick-ſetting the diſtance muſt be regulated by ſituation. If upon ploughed land, one in a foot is ſufficient, if you could inſure the growing of them all; but at ſix inches apart is the ſafer way, and this is my conſtant practice.

As to plaſhing of hedges, Hertfordſhire has generally been eſteemed the county of all the kingdom where this work is beſt underſtood, and where it is performed in the neateſt manner. But in that county it is uſual for gentlemen to have a covenant inſerted in the leaſes they grant, to reſtrict the farmers from cutting and plaſhing the hedges more than once in the ſpace of ten years. The beſt method of plaſhing, in my opinion, is, to cut them much earlier, as, when young, the branches ſhoot more vigorouſly, and a young thorn cut off will grow with more luxuriance than from the firſt planting. You will do well to aſſiſt the ſhoot by adding a little freſh earth to the bottom of

the quick, as that will not only cauſe the quick to grow better, but will likewiſe ſnub or check the graſs roots, and prevent the weeds from getting up and injuring the growth of the hedge. If the ditch be dreſſed out, it will add to the goodneſs of the fence; and ſhould the ditch be wanted for a drain, it will pay well for the expence.

The firſt thing neceſſary towards plaſhing a hedge is to furniſh yourſelf with a good hedging-bill, which an expert workman will always keep in the higheſt order; for the neatneſs of the hedge depends in a great meaſure on the ſharpneſs of the tool. Cut down the old ſtubs within two or three inches of the ground, or ſo low as that the next time the hedge is plaſhed the dreſſing up the ditch may cover the ſtump, and that the part laid down, which is called the layer, ſhould have as little connection with the old ſtump as poſſible, certainly not more than ſufficient to convey the ſap, and afford adequate nouriſhment to the plaſh or layer; for which purpoſe a good workman will at a ſtroke cut it almoſt through. By this means the ſtump will ſoon throw out freſh wood for a young

young fence, as the layer is only intended to ſerve the purpoſe until the young one gets up again. Thoſe who practiſe chopping up hedges may ſay, "Why not chop up the hedge?" But I ſay, who would prefer a dead fence, when he may have a living one? It is to be underſtood, that the healthieſt and beſt ſhoots are to be left for the purpoſe of laying down to fill up the thin places; and a ſufficient number muſt alſo be be left for the purpoſe of ſtakes, which are better of a ſmall ſize, about the thickneſs of a walking-ſtick; for, as they are to be left growing, they will ſoon increaſe in bulk.—They muſt be cut off to the height of the intended fence, as they will grow with it, and are to be left at a proper diſtance from each other. The hedge muſt be thinned of all wood but that which may be wanted for plaſhes, or ſtakes; and in thoſe counties where fuel is dear, the ſuperabundant wood pays the farmer amply for the expence of plaſhing.

It has been an objection of long ſtanding, that the farmers in the northern parts of the kingdom, and particularly in Yorkſhire, lay their plaſhes too high. It is certainly a wrong practice

practice; for by ſuch means the ſap or nouriſhment is all conveyed into the plaſhes, the ſhoots are robbed of their food, and become trifling and weak at the bottom, and the hedge is reduced in the part where ſtrength is moſt required. In fact, in plaſhing he will do his work in the beſt manner who avoids either extreme of high or low, for both are pernicious.

When the layers are interwoven with the living ſtakes, and the hedge dreſſed by cutting off ſuperfluous twigs, it will be proper to give the layer a nick or cut with the hedge-bill at every foot diſtance; for by this means the ſap will be prevented from riſing too rapidly, and the layer will puſh out a far greater number of branches betwixt each nick.

By attending carefully to the raiſing and keeping in order live hedges, you will remove one great temptation which the idle poor have in dead fences, to bring up their children from the earlieſt infancy in the habits of thieving, and which vice, being literally ſucked in with their milk, generally clings cloſe in a maturer age. How often do we ſee a ragged family conſiſting of a woman, half a dozen children,

perhaps

perhaps one probably at the breaſt, returning to their miſerable cottage laden with the plunder obtained from dead hedges, and conſuming that time in pitiful pilfering, which, if honeſtly and induſtriouſly employed, would procure them a comfortable ſubſiſtence! In vain does the law threaten puniſhment, or the farmer cauſe it to be inflicted—a clamour is raiſed againſt him for cruelty: the depredators are ſeldom deterred, but proceed gradually to higher crimes until they finiſh their career in public, or by good fortune paſs the remainder of their lives at a diſtance from Europe.

If for the firſt two or three years after plaſhing the field is ploughed, the hedge will thrive much the better for it.

SECTION

SECTION LXXIX.

Management of the Dairy, making Cheeſe, &c.

THE choice and management of cows are the firſt things to be conſidered in a dairy. I have already deſcribed in Section XXVIII. the ſort of cow moſt profitable for the dairy: it remains to ſpeak here of the proper management. Twice each day, at regular and ſtated hours, it is neceſſary to be careful in milking the cows perfectly clean; as any milk left in the udder may occaſion more loſs than the quantity left behind. This will be eaſily conceived by thoſe who want a cow to go dry; for they know that the moſt effectual method is to leave part of the milk in the udder, and the cow will daily decreaſe in her quantity, and ſoon become dry. It is adviſeable, when the cow appears to have given all ſhe can, to rub her udder and ſtroke it down with your hand, to give an opportunity to the milk that lies high up to come down. That done, draw her paps again,

again, or *ſtrop* her, as the milk-maids ſay. The cow by ſuch means will increaſe her milk ; for nature will abundantly ſupply the loſs if the animal has plenty of food.

It is not unuſual for a cow to gargle in the time of her giving milk, which malady ariſes ſolely from bad milking; for the gargle is a congeſtion of milk in the udder; which in general will give way to any of the common fomentations. The cow, although certainly more valuable than the race-horſe, is not ſo much the care of the preſent age ; nor does the modern parent bring up his daughter to the buſineſs of a dairy or houſehold work. If he can afford any education to the child intended for a ſervant, his money is ſpent in teaching her to dreſs hair, and to acquire a little ſmattering of the French tongue; and inſtead of being qualified for a farmer's wife, miſs daſhes into the world a lady's maid ; and if ſhe has a tolerable face or perſon, ſhe ſoon changes her ſituation.

Having endeavoured to ſhow the neceſſity of milking the cow perfectly clean, I ſhall ſay a few words concerning the dairy where the milk

milk is to be depoſited. In reſpect to the ſituation of a dairy (and we will ſuppoſe a building erected for that purpoſe only), the aſpect ſhould be due north and ſouth. The north front ſhould have the greateſt number of apertures for the admiſſion of cold air; and there ſhould be a ſufficient quantity of trees on the ſouth front to ſhade the building from the ſun. Where the ſituation will permit, it ſhould be ſunk three or four feet below the ſurface, proper drains laid, and an area made round it to prevent damps. You may go down to it by a few ſteps, or the ground may be dug away on the north ſide for ſix or ſeven feet wide, and you may deſcend by a gradual ſlope to the door. The windows or openings may be covered with wire, ſuch as is uſed for making ſieves, which will freely admit the air and keep out the flies. The floor ſhould be of ſtone; and the walls ſhould be covered with a ſtrong ſtucco, or with glazed tiles. At the eaſt and weſt end niches may be left for the purpoſe of ornament, and the convenience of placing large jars or vaſes to hold cream. The frame which is to contain ſuch veſſels as the milk is put

put in to ſet, may be ſupported by pillars of ſtone, which for the ſake of cheapneſs may be made ſquare; the frame itſelf may be of oak, and the pans (which are made for the expreſs purpoſe) of glazed earthen ware—for I by no means approve of ciſterns or troughs lined with lead; milk being ſo far corroſive, that it will in a ſhort time produce a ceruſe. The neceſſary ſhelves, &c. may be placed to the fancy of the owner. At one end muſt be a door of communication to the ſcullery where the copper is placed, and where the dairy-maid is to do a principal part of her buſineſs.

I have here given a ſketch of a dairy that may be fitted up in a ſtyle of elegant neatneſs, and at a ſmall expence. There are ſome which are far more coſtly, and I know of none which, for the ſize of it, ſurpaſſes that made by the late Captain Foulis on Epping foreſt. It may not perhaps be deemed impertinent to give a ſhort deſcription of it, though few have the power to imitate it. The building is nearly ſquare, as it was not originally erected for the purpoſe; the floor is a marble moſaic pavement, to which you deſcend by half a dozen

marble ſteps. There is a ſtrong frame of fir timber (as oak emits a liquor that dyes marble of a deep red colour), which is ſupported by a number of ſmall columns of the Doric order about three feet high, with their capitals and baſes all of white marble. On the frame are placed a number of white marble troughs, which by their projection are ſo contrived as completely to conceal the wood work, and are as highly poliſhed as china-ware—a precaution very neceſſary; for without it the corroſive quality of the milk would render them like a honey comb. Theſe troughs have each a hole cut through for the purpoſe of emptying and cleaning them, being too weighty to be moved; and they have ſtoppers of cork with a ſilver ring and chain, almoſt like thoſe uſed for decanters: the walls are encruſted with porcelain tiles of a foot ſquare made in China for the expreſs purpoſe, and ſo contrived that by means of laths paſſed through them, they ſeem to form one ſolid body. The ſhelves are of white marble, and ſupported by cantilivers of the ſame curiouſly inlaid. The roof of this little curioſity forms a dome, which is terminated in the

the moſt elevated part by a very valuable and exceeding large ſhell, of a fine blue tint reſembling the ſky on a clear ſummer day: in ſhort, the whole of the dome is compoſed of valuable ſhells from the Eaſt Indies, which but few perſons can have the opportunity of procuring.

We will return to the farmer's dairy, which may reaſonably be ſuppoſed to have a free circulation of air, at leaſt enough to cool the milk expeditiouſly; and until it does become ſo, it muſt be kept moving in the kit. The exact degree of coolneſs at which it is proper to paſs the milk through the ſtrainer might be aſcertained, as in the brewery, by a thermometer, which, ridiculous as it may ſeem to ſome, I hope to ſee as common in the dairy as the brew houſe. Surely a thermometer is more to be depended upon, than the uncertain and not very delicate method of immerging the hand. I do not inſiſt upon it that the uſe of this inſtrument would eſtabliſh an unerring method of making both cheeſe and butter; but no one will cavil ſurely at an attempt to bring ſuch uſeful articles to perfection. The practice

now

now is, to gueſs by the touch when the milk is cool enough to caſt the cream, ſo as not to froth at top, hang ropy or cling together like the ſcum of boiled milk; but, when creamed, part freely, as ſmooth as well-boiled cuſtard.

Milk in a good dairy will keep from four to ſix meals old (or about three days), and continue caſting cream to advantage, if the veſſels are well ſcalded. If the cows have had wholeſome and ſweet food, there is no fear but that the butter from cream ſo kept will be good.—But I muſt repeat my caution not to keep milk for ſuch length of time in veſſels lined with lead.

Too much attention cannot be paid to cleaning the veſſels you ſtrain your milk into. The cream-coloured ware made by the potters in Staffordſhire is by far the ſweeteſt and eaſieſt cleaned, owing principally to the ſuperiority of their glazing; but ſome for the ſake of cheapneſs (except many of thoſe who having very large dairies adopted thoſe filthy troughs lined with lead) make uſe for the moſt part of earthen pans, which being glazed by a coarſe compoſition of ſand, lead, wood-aſhes, and a little

little ſalt, require much care in the cleaning. For theſe pans you ſhould have a copper (but an iron pan is much better) large enough to boil them in, and thoſe who have not the conveniency of copper or pan muſt put the earthen-ware in a tub, ſetting one within another in boiling water. Waſh them out firſt in a ſmall quantity of water, which muſt be preſerved for the pigs. The pans muſt remain ſome time in hot water, that they may be ſufficiently ſcalded; and when taken out muſt be wiped perfectly dry with a clean cloth, and ſet abroad in the air upon a rack made for that purpoſe, where they will become perfectly ſweet.—Wooden veſſels are uſed by ſome, and are reckoned to caſt the cream quicker and more of it than any other: but they require more labour and care in cleaning, and are coſtly.

If your cows have eaten any kind of food that cauſes the butter to be diſagreeable to taſte or ſmell—turnips for example, which few admire at ſecond hand—put a ſmall quantity of ſharp vinegar into the bottom of the pot or pan for holding the cream; and by pouring the cream upon it the diſagreeable flavour will be

be loſt, or in a great meaſure taken off. I have tried many other things, ſuch as cream of tartar, lemon juice, nitre, &c. but good vinegar is the cheapeſt and in my opinion, the beſt remedy.

To have butter of the fineſt quality poſſible, the cream ought to be churned every morning. The churn muſt be kept very clean, and cold water remain it it for ſome time if the weather is hot; but in cold weather the water muſt be put into the churn hot, and poured out after rinſing round ſeveral times, and the cream immediately put in. In hot weather ſet your churn in a cool place when the cream is in; and churn ſlowly, or your butter will be light and ſoft. In cold weather you will do well to ſet your cream in a pot before the fire, or put it in warm water, and ſtir it about to warm the cream before you put it into the churn; and churn by the fire-ſide. In winter the cream is liable to flow or ſwell: you muſt then pour ſome hot water upon it when it riſes in the churn, and it will make the butter come the ſooner. In ſummer if you put cold water in the churn with the cream

cream, it will ſtiffen the butter, and make it gather quicker, as hot water does in winter.

When the butter is taken out of the churn, waſh the butter-milk from it by two or three good waſhings with clean ſpring water, ſprinkle ſalt over it, and mix the ſalt and butter well together. The quantity of ſalt neceſſary muſt be regulated by your taſte. In ſummer put the butter into ſome ſpring water for a few hours, then work it well with a butter-diſh made purpoſely for that uſe.

To make Cheeſe.—The following are the ſorts of cheeſe made from cows-milk only; for in England we are not ſo frugal as thoſe on the Continent, who make both ſheep and goats contribute towards furniſhing the article; we content ourſelves with purchaſing as dainties what we are too idle to make at home, from materials which abound in greater plenty than with thoſe who make uſe of them to advantage.

To make what is generally called Stilton cheeſe, let about half the quantity of the milk ſtand until it becomes acid, and coagulated or *lappered*; taking care to ſkim off the cream before

fore it is perfectly sour, which you will preserve in a pot for a day or two before it is used. Stir the cream in the pot as if for churning. You must, the day before you make the sour milk into curd for cheese, prepare a quantity of milk just taken from the cow, and make that into curd; and when properly drained put the curd into some vessel, adding a sufficient quantity of spring water, and let it stand for twenty-four hours. The next day take the lappered milk with the cream put to it; add some other milk one or two meals old with the cream belonging to it. The quantity of curd put into the water ought to equal that of the old milk. Mix the different curds together as well as you can; put the whole into a vat, or tie it in a cloth—if you choose to have a round cheese; but if you prefer the form of the Stilton, the vat must be deep and narrow. This sort of cheese must be pressed very lightly, and must be frequently turned in the press. By light pressing, the cheese will retain its richness; by frequent turning, both ends will be alike in goodness. If you suffer one end continually to be undermost, the upper part will not be so

rich

rich. A round cheeſe muſt alſo be often turned, ſometimes one end uppermoſt, ſometimes the other; and the more gradually you preſs any kind of cheeſe, the better. The richneſs of cheeſe in ſome meaſure depends upon the quantity of cream; and as you are laviſh or ſparing of cream, will your cheeſe, if properly managed, be rich or poor in quality: but no better need be made than what is above directed.

Some precaution is neceſſary in reſpect to drying cheeſe. Care muſt be taken not to dry it too quick. No cheeſe ſhould be kept either very wet or very dry, after being once properly cured. In curing cheeſe you ſalt it as you would do butter, and your palate muſt be the regulator. Thoſe who are fond of the taſte of ſalt ſprinkle a little in the curd. By mixing the curd as above directed, your cheeſe will turn to a blue mould. But to make a cheeſe decay expeditiouſly, bore a hole with a cheeſe-taſter, and pour ſome ale, porter, or, if you can afford it, ſome port wine, into the hole ſome little time before you intend to uſe it—the epicure will not think the wine waſted.

If the cheeſe is made very rich, it is liable to be ſpoiled by ſmall inſects called ſalt-worms, which frequently in ſummer breed in cheeſe before it becomes dry, and quickly deſtroy it. In winter the ſalt-worm is found in cheeſe; but at that ſeaſon does very little damage: it is eſteemed a delicacy by cheeſe-eaters, who devour thouſands after a hearty dinner.

Cheeſe is dried on boards, which muſt be kept very clean by frequent waſhing with boiling water, and wiping with dry cloths. When the boards are waſhed, the hotter the water is uſed the better: to ſcour them with unſlaked lime is an excellent method; for I know of nothing which becomes ſooner putrid or emits more fœtid effluvia than the whey of cheeſe.—It will be neceſſary to turn cheeſe twice a day for the firſt two or three days after it has been laid on the board, and to wipe both cheeſe and board each time with a clean cloth. The place it is dried in muſt be ſcreened from the ſun, but have a free circulation of air. I do not mean that it ſhould be expoſed to a current of wind; for that would cauſe the cheeſe to crack: it muſt dry gradually in pure ſweet air. A

Stilton

Stilton cheeſe ſhould be twelve months old at leaſt, and kept in a pot in a cellar, or ſome damp place, a month before you uſe it.

They make a cream-cheeſe at York and the environs, which is called *York-cheeſe*. Very little ingenuity is required to make ſuch cheeſe, as it is nothing more than putting a quantity of good ſweet cream into a cheeſe-vat, with ſome green ruſhes ſewed together on purpoſe at the bottom of the vat, which muſt have a ſufficient number of holes to let the whey which drains off paſs freely away. On the top of the cheeſe you muſt likewiſe lay ruſhes in the ſame manner as at the bottom. It is uſual to make theſe cheeſes from one inch to one inch and a half in thickneſs. The thinner they are made, the ſooner they are ready of courſe, as this cheeſe is in fact no more than cream dried ſufficiently to be cut with a knife like butter in cool weather. There can be no new cheeſe better than this York cheeſe if properly managed.

There is another ſort called Trent-ſide cheeſe, which is excellent for toaſting. It is made all of new milk put rather warm together.

ther. This ſort of cheeſe is apt to riſe, heave, or blow up; but that may be eaſily prevented by putting in a ſmall quantity of ſour milk, or butter-milk, or by pouring ſome boiling-hot milk or whey over the curd. Yet many tons of cheeſe are ſpoiled by heaving. Trent-ſide cheeſes are preſſed quicker, and made from two to two inches and a half thick; and as ſoon as they will bear taking from the board, they are put to dry on a rack edge-wiſe. The rack muſt be made to ſtand from the ground, or hang by ropes.

Care muſt be taken to ſecure your cheeſe from rats and mice; for the common enemy of rats and mice will not guard your cheeſe from depredation. Cats are fond of new cheeſe.—Your remedy (ſuppoſing the rack to be raiſed upon feet to a proper diſtance from the ground) is to ſurround thoſe feet with tin in a conic or ſugar-loaf ſhape, which will prevent thoſe deſtructive vermin from crawling up. I ſpeak of rats and mice; for, as to cats, they are ſo nimble that nothing but excluſion can preſerve your cheeſe from them.

When

When the rack is made, the ſpindles muſt be placed at ſuch diſtance from each other as you intend the thickneſs of your cheeſe to be: for inſtance, Stilton cheeſe (not that which is hung up to dry in nets) is made from nine to eighteen inches thick—the Trent-ſide cheeſes, two inches and one half thick. The Cheſhire cheeſes are made very large. Large cheeſes are not very profitable to the farmer. A large Cheſhire cheeſe, though ſo highly eſteemed all over the world, and preferred in Italy to the Parmeſan, will not enrich the maker very ſpeedily; as it will take ſeven years to ripen, and a Stilton cheeſe will be in the higheſt perfection in twelve months. The Trent-ſide cheeſe is in high perfection in ſix months, and bears carriage well, as it has a very tough coat. The York cream-cheeſe may be uſed in a fortnight or three weeks. We muſt allow Cheſhire cheeſe to be the beſt of any for exportation.

There is a ſort called Cottenham or Eddiſh cheeſe, made at the latter end of the year. This cheeſe is made like that called Trent-ſide, before mentioned, and is liable to riſe: therefore

therefore it muſt be made thin; as the thinner a cheeſe is, the leſs apt it is to riſe. The reaſon is very ſimple. When thin, it muſt of courſe contain leſs whey, which, when redundant, produces fermentation. It may ſeem unneceſſary to repeat, that great caution muſt be uſed to prevent riſing. By putting milk together very hot, and adding the runnet immediately, the whey will become green, drain away much eaſier, and moſt probably prevent the riſing; but the cheeſe by this management runs the riſk of being poor. If you take the curd, break it with your hand and knead it into the cheeſe-vat, the whey will drain from the curd; and by preſſing the curd very hard in the cheeſe-vat you may in part, but not totally, prevent the riſing. At the ſeaſon this cheeſe is made, you may not perhaps have any ſour milk: in that caſe you muſt put the milk hotter together.

There is another ſort of cheeſe as uſeful and much more profitable than any of thoſe before mentioned, which is ſkim-milk cheeſe. The method of making this is ſimilar in all reſpects to the method already laid down for making Stil-

ton

ton cheeſe if you wiſh to have it mouldy. But if you prefer having it ſound, you muſt put the lappered milk and the ſweet milk together, and put the runnet to it much hotter. This ſort of cheeſe may be made to keep for as great a length of time as any; and, if made as directed for the Stilton, it will ſeem to the palate as good as cheeſe made of half new milk in the common way. I never knew a working man who did not, after being uſed to this cheeſe, prefer it to any other to make a hearty meal of. This is without doubt the moſt profitable method of managing a dairy where you have no ready opportunity of ſelling milk; as you may thus be able to ſend more butter to market.—The hotter any kind of cheeſe is put together, the ſounder it will be; and the cooler you put it together, the richer you will find it, and the ſooner it will decay.

There is another ſort of cheeſe called Slip-coat, which is made by mixing one quart of warm water with two quarts of new milk (or any larger quantity in proportion), and putting runnet to it. Then take the curd gently out of the whey, and lay it on a cloth ſpread over the

the cheeſe-vat. Preſs the cheeſe very lightly for twenty-four hours; take it out, and put it in ſome warm ſituation where it may have the benefit of the ſun. It muſt be placed between two diſhes: when it begins to ſlip, you may put dock leaves, or the leaves of ſycamore, above and below the cheeſe. This is a profitable cheeſe to the maker, and, if well managed, is but little inferior to the cream-cheeſe. The thinner this kind of cheeſe is made, the ſooner it will be fit for uſe, and the ſweeter to the palate; for, if it is made thick, the outer part will ſpoil before the inſide is changed from curd. This cheeſe will keep but a very ſhort time: but you may regulate the quantity to be made according to the demand for it.

Cheſhire cheeſe is made of new milk; and you cannot eaſily err in making it; for the rich flavour and the mellowneſs of this cheeſe are given it by an addition of beef ſuet, or any other wholeſome and ſweet fat well clarified, which is poured into and mixed with the curd, together with a ſufficient quantity of ſalt, which is abſolutely neceſſary to prevent the fat contracting

tracting a rancid flavour. As much precaution is required in this reſpect as in curing bacon.

It is to be obſerved, that all cheeſes except the Cheſhire, will be ſufficiently ſalted by rubbing them with a little ſalt after being taken out of the cheeſe-vat, and repeating the ſame operation for a few days.

Cheeſe is eaſily made of any colour. Yellow is generally the favourite; and this is given by bruiſing marygolds and mixing the juice with the milk, which is both pleaſant and wholeſome. Many prefer a green colour, which may be communicated by mixing in the manner juſt mentioned the juice of ſage.

In winter ſome uſe the juice of carrots for colouring butter, which is certainly a great addition; but butter coloured with carrots will not keep for any length of time.

The beſt method of preſerving cheeſes intended for keeping is to put them into a barley-mow, not ſuffering them to touch each other, and ſecuring them from rats and mice. This will ſave a great deal of trouble, by keeping the mites from breeding in them, which

are very deſtructive where there are large quantities of cheeſe. Before the cheeſes are depoſited in the barley-mow, they muſt be well waſhed with hot whey, to take away and deſtroy both the mites and their eggs, or they will increaſe in the barley-mow moſt rapidly.

Rennet, runnet, or what is commonly called *earning*, is properly the acid juice or curd found in the ſtomachs of calves whoſe food has been only milk, and who are ſlaughtered before digeſtion is perfected. But the butchers have a ſuccedaneum for the juice, by infuſing a piece of the ſtomach where the curd lodges (called by them the cheeſe-lop) in ſalt and water; and this effectually anſwers the purpoſe intended.

SECTION

SECTION LXXX.

Management of Poultry.

AT the time I profeſs giving directions for the management of poultry, I cannot avoid hinting to the farmer, that he muſt not rely upon the profits ariſing from breeding and rearing poultry for the payment of any part of his rent. I do not mean to diſcourage raiſing what I am fond of eating: but I ſhould not prove myſelf the friend of the farmer if I did not ſhow both ſides of the queſtion, and tell him it is poſſible to loſe by miſmanagement in this article, and ſcarce probable to gain, unleſs he ſelects a particular ſpecies or ſort.

We will for example begin with Turkeys—thoſe voracious animals, which will devour as much as any quadruped on the farm, not excepting even the hog, which can be raiſed at leſs expence. Calculate, if you can, what a turkey will coſt by the time he is fit for the ſpit. So ſoon as hatched, he muſt be treated delicately, fed on white bread and milk. The

pip

pip comes on, which muſt be cured with fine wheaten bread and freſh butter mixed with ſome herb-graſs or rue. On this kind of food he will live until he is a month old; when he muſt be fed with whole oatmeal and milk, and care muſt be taken that the milk be perfectly new and ſweet, or your turkeys die in a few hours. When two months old, they will live upon ſmall wheat, and by the time harveſt comes on will provide for themſelves at your expence. If the craw of a turkey were taken out in the evening about Chriſtmas, the corn meaſured that would be found in it, and the quantity multiplied by the number of days ſince the turkey attained the age of two months, the product would ſtartle the farmer—without taking bread and milk into the account, which is no trifling matter. Few turkeys are fit for the kitchen but what coſt the farmer from twenty to thirty ſhillings, although he ſells them at market for four and ſix-pence, or five ſhillings.

We will ſuppoſe that thirteen have been the brood hatched. The breeder may think himſelf fortunate if from ſix to ten are raiſed.—Then come two to ſhare in the profit of what they

they have contributed nothing to the expence of—I mean the tithing-man and the fox, who may not be content with a tithe only; and you may add to this catalogue of expences the keep of the old turkeys the year round. I could rear a horſe upon leſs corn than two turkeys would devour, if they were at liberty to help themſelves. I have been told that in France they have an extraordinary method of fattening them with walnuts, which theſe devouring birds ſwallow whole, to the number of a dozen within the day; and they digeſt them as the oſtrich is ſaid to do iron. In ſhort, I would adviſe the farmer to leave the breeding of turkeys to gentlemen of fortune.

Though I have ſaid ſo much againſt turkeys, yet there are ſome tracts of land where they may be bred to advantage; as in the marſhes of Lincolnſhire, where little or no corn is grown. In ſuch places they might be reared on the bent or ſeeds of graſs: but ſuch food does not fatten them for uſe; therefore, the advantage is ſolely in the breeding.

Chickens, though by many degrees not ſo bad as turkeys, will not pay for breeding.

Geeſe

Geeſe are profitable; for they will thrive on graſs and water, and plucking them twice a year amply pays by the feathers for the graſs they eat. A peck of oats managed properly will fatten a gooſe ſo as to be worth from four to five ſhillings in her feathers; and oats muſt be ſcarce if a peck is valued at nine-pence, which is twenty-four ſhillings per quarter.—But, ſuppoſing a gooſe to eat a peck and a half of oats, the coſt will not exceed thirteen pence half-penny; ſo that a gooſe will pay the breeder.

Ducks may be eſtimated on the ſame footing as geeſe; and where you have the advantage of water, they will pay well for breeding.

Pigeons, to thoſe who have no corn and can reconcile their conſciences to the plundering their neighbours, may be profitable; for little regard is now paid to the ſtatute which forbids the erecting a dove-cot but by leave of the lord of the manor, or even keeping pigeons without his permiſſion.

To the farmer whoſe pigeons eat his own corn they are very expenſive. Pigeons are gluttons: the quantity of corn they devour is almoſt

almoſt incredible; and the havock they make at the time corn is ripening is aſtoniſhing. By alighting upon it in flocks, they preſs it down in ſuch a manner as to deſtroy a much greater quantity than they eat. In ſhort, pigeons are as deſtructive amongſt corn as pigs.

All other domeſtic fowls being kept more for pleaſure than profit, it is needleſs to mention them.

SECTION LXXXI.

The neceſſity of Improvements in Agriculture: the great Advantage thence ariſing to Individuals, and to the Public at large.

THE neceſſity of improving this primary and moſt uſeful art, by which we exiſt (for we muſt ultimately depend upon the produce of the earth for ſupport), has been too recently proved by the large ſums of money ſent out of the kingdom for corn, which might with ſo much advantage to the community have been raiſed upon a ſmall portion of the uncultivated

waſtes

waſtes that to the diſgrace of the kingdom exiſt here in ſuch abundance. If the truly patriotic propoſal of that philanthropiſt, Sir John Sinclair, for a general incloſure of commons had been carried into effect, we ſhould in a little time have increaſed our population, have found plenty of employment for the laborious poor, and have afforded our numerous mechanics and artiſans proviſions at a cheap rate—the grand deſideratum in a country depending ſo much on the auxiliary aid of manufacturers and commerce. The preſent miſerable ſtate of Holland affords a ſtriking leſſon of the inſtability of trade; and of the diſtreſſes a nation is liable to, which without internal agricultural reſources relies ſolely on commerce for the importation of the neceſſaries of life.

However high the ſcience of Agriculture is at preſent, and however near perfection ſome perſons may ſuppoſe it has arrived, I do not heſitate to aſſert that, take all ſuch land through the kingdom as is in a ſtate of cultivation, it does not produce one third of what it is capable of. Surely no one will deny, if my aſſertion be fact, the neceſſity of improvement; and

I flatter

I flatter myſelf in the foregoing ſheets to have given ſome uſeful inſtructions for that purpoſe. I cannot avoid reverting to the quantity of uncultivated ground, and eſpecially where ground is ſo valuable, in the vicinity of the metropolis of this great empire! London is nearly ſurrounded at a very ſhort diſtance by commons! What a pity it is that thoſe who have gained a competency in buſineſs are not ſuffered to purchaſe parts of theſe at preſent uſeleſs tracts. We might then ſee the city ſhopkeeper, perhaps a man-milliner, become a uſeful member of ſociety; and, if not tilling his own field, at leaſt giving employment to whole families, calculating what a landed eſtate he ſhall leave behind him, keeping his faculties in action, enjoying the pleaſures of a rural life, and leaving others to drudge in the ſhop and accumulate money in their turn.

To improve agriculture is the means to create plenty, which ſo much adds to the happineſs of man; as it makes him contented with his condition, and with the conſtitution and laws of his country.

To obtain plenty a man muſt be induſtrious; and induſtry ſo much fills a man's mind as to give recreation to every moment of his time, prevent all idle thoughts, vicious deſires, and cauſe him to wiſh well to every one around him. He begins to conſider himſelf a part of the ſtate, when, by ſucceſsful labour, he ſees himſelf bleſſed with independence. The innocent amuſement of tilling the ſoil, the regularity of hours required in the occupation of an attentive huſbandman, and going to bed with the ſun, and ſpending all his days in a free air, the harmony of the birds, the fragrance of the fields, give to the farmer calmneſs and ſerenity of mind, and pleaſures unknown to other men. His expectations from the improvement or experiment he makes are ſeldom blaſted; for land is ſo wonderfully grateful, as to make a return for every favour ſhown her. In his labours there is no tedious ſameneſs, but ſomething new every day to amuſe him.

The improvements agriculture is capable of are boundleſs: in all paſt ages it has been progreſſively meliorated; and by attending to the directions given in this Work, arable land will

ſupply

ſupply the market with double the quantity it has hitherto produced; and the expence of cultivation, in a great many inſtances, will be leſs. From the produce of the land we all exiſt: from that ſource all our trade derives its origin and ſupport. As to foreign commerce—no country would ſupply us with what is uſeful and agreeable, if we had nothing to give in return: and the greater the plenty we have of the neceſſaries of life, the more numerous and cheap will be our manufactures to ſupply the markets abroad.

The cheapneſs of proviſions ariſing from an improved method of agriculture would likewiſe tend to check the preſent alarming ſpirit of emigration; for none would be apt to relinquiſh his country and his home, if he could no where live better or cheaper.

The farmer often complains of the dearneſs of labour. But the price of articles of the firſt neceſſity muſt be reduced, before that of labour can be expected to be lower. No man can live without meat; ſtill leſs the working man, who is the real ſupport of all. Thouſands and tens of thouſands of pounds are loſt for

for want of employing the lower claſs of people to raiſe that which would make them the moſt uſeful, happy and independent of men.—We none of us get more than meat and clothes; and he that earns theſe neceſſaries by his own labours, is the really bleſſed: his diſappointments are few and ſmall, his enjoyments many. Health, the greateſt good that any man can enjoy, is more likely to be found in his cottage than in the luxurious palace. Early riſing, the regularity of his diet and exerciſe, preſerve both his body and mind in a ſtate of ſanity.

It is every one's intereſt that land be improved, even of ſuch as live upon ſalaries, certain ſtipends and annuities. If they can buy beef for 4*d.* per pound, inſtead of 7*d.* per pound, and a penny loaf of bread for a half-penny, it puts it in their power to live in a more ſumptuous manner; and the tradeſman can live on leſs profit, and every one in turn. The taxes are more likely to be paid, if every man brought two quarters of wheat to market inſtead of one, and every other product of the land in proportion. Inſtead of the preſent exorbitant

orbitant poor-rates, there would be only a trifling contribution required for the ſupport of a few old people and fatherleſs children. We have all theſe reſources before us: both land and people already prepared.

It is true there are many thouſand acres uninclоſed, and very improperly employed. But I am of opinion, that acre for acre, the commons according to their value feed more ſtock than the incloſed lands. I have reaſon to believe that incloſing of open common fields, cauſes a diminution of grain. From the appearance of all old ſwards, it is evident, they have been ploughed and ſown with corn.—When incloſed, the land is divided into graſs-fields, and ſeldom tilled; and on many thouſand acres of incloſed land the graſs grows to very little purpoſe, as it is either not above half eaten, or covered with thiſtles and other noxious weeds. In many parts of the kingdom, according to the preſent ſyſtem, four acres maintain, on an average, no more than one cow, or one horſe, twelve months. I will undertake to keep ten cows and ten pigs, and produce ten acres of wheat every year upon twenty acres of this

this land, that now only keeps five cows and two pigs. I ſhall have from fifty to ſixty quarters of wheat upon the ten acres, and buy no manure; the produce of the land furniſhing ſufficient for it.

But let it not be underſtood that I am an encourager of waſtes and commons—I hate them. It is not, indeed, to be aſcribed entirely to the induſtry of the people that commons are ſo abundantly ſtocked, but too often to envy. The man who poſſeſſes right of common thus reaſons with himſelf: "Although it is of no uſe to me to ſtock the common; if I neglect to do it, my neighbour will enjoy the whole as if it were an encloſure belonging to him. Therefore, to prevent him, I will injure myſelf." It is wonderful to ſee what numbers of ſheep feed upon the commons in Weſtmoreland and Cumberland; and yet I would not have that land for incloſing to divide into fields ten acres each field. I could apply money much better, by taking land of a more fertile nature. There are, however, thouſands of acres with a rich and improvable ſoil unincloſed, which in their preſent

ſent ſtate are very hurtful to the community. For inſtance: if my neighbour has ſheep infected with the ſcab or any other diſeaſe, I am compelled to expoſe mine to the contagion. Nor in common fields is there any encouragement to attempt improvements; for I muſt do as my neighbour does; muſt ſow corn one year, and ſtock the field another, when it is fallow. I do not know a more droll idea than when the farmer extolls the uſe of the fallow to keep ſheep upon, which is a very frequent phraſe to expreſs the uſe of the field the fallow year, when it ought to be without either graſs or weed. If one man chooſes to be negligent and till his land improperly, has a crop of thiſtles, and lets them ſtand for ſeed, I muſt reap along with him the benefit; as the ſeed of thiſtles will not confine itſelf to any particular ſpot.—It would be difficult to perſuade the prejudiced farmer, that a crop of fine corn, clover, or turnips, would leſs exhauſt the land than what he calls that year *reſting* it. Now, had that part of the field produced a good crop of corn, the ſtraw, properly treated, would make a dung-hill, the grain would ſell

for

for money, and the ground be in a much cleaner ſtate than with the crop of weeds upon it.

Since I have been in London, I have ridden out and taken the liberty of examining into the mode of agriculture near Town, called *gardening*. A large quantity of the land was full of couch-graſs and weeds of all denominations, ſome in full bloom and others in ſeed. I ſaw one field of rye betwixt London and Wimbledon-Common where the thiſtles had maſtered the rye; and the farmer was cutting them down before the rye was ripe. Were you to converſe with him on the ſubject, he would endeavour to perſuade you that the expence of deſtroying the thiſtles would have exceeded the value of the crop. There are more weeds in the crops of corn near London than I ever ſaw in any other part of the kingdom I have travelled through.

It may be of uſe to enquire into the cauſes of the farmer's neglecting his fields, and ſuffering them to be over-run with weeds. I ſuſpect it is owing to the value of the produce of the land having riſen in a greater proportion than the land itſelf. If a man has a farm of one hundred

hundred acres, and he cultivates but ten acres, and the produce ſells ſo high as to enable him to pay the landlord his demand, and to maintain his family; it is the ſame to him as if he tilled all the hundred acres properly. Suppoſing the ten acres to produce forty quarters of wheat, and that wheat ſold at 8*l.* per quarter, he would receive 320*l.*; and, if his rent were 100*l.* he would as an individual be better off than if the whole farm had been ſown with wheat, and produced four hundred quarters when wheat ſold at 20*s.* per quarter. But how much does that injure the public at large, and eſpecially manufactures and trade, which from the dearneſs of proviſions muſt in time be inevitably diminiſhed! Beef and mutton uſed to be 3*d.* and 4*d.* per pound, and are now ſold at 7*d.* per pound in many places. This affects not all who eat meat, but all thoſe who are not concerned with the landed property—the farmer the *leaſt*. But it affects all mechanics and tradeſmen of every deſcription. Therefore it ſoon falls back upon the land; for the grocer muſt have a greater profit on his ſugar, candles and ſoap, and the taylor more for

making a coat, &c. or they will not find money to buy your beef. The man of landed property, then, only holds the money for a time, as all mechanics and traders whatever muſt have the means to buy the beef, bread and butter at the advanced price. Now, to prevent the above evils, what muſt be done? I dare ſay every thinking man will allow the land in its preſent ſtate does not produce all it is capable of producing. Therefore we muſt endeavour ſo to cultivate it that it may ſend more to market; viz. by tilling it and raiſing crops of corn, turnips, clover, &c. I am of opinion two thirds (if not one half) of the graſs land in the kingdom would keep, if properly managed, the ſame quantity of ſtock that the whole now does; and there would be one third left to be ploughed. This ſort of management would not only fill the markets full of grain, but of fleſh; for in winter, when cattle, ſheep, and horſes require moſt ſupport, they derive their food chiefly from the produce of the arable land.

But ſome will ſay, "There are neither people nor money ſufficient to put this plan in practice."

practice." I on the contrary opine, there is of both; for, if the money expended in the execution of the preſent poor-laws for removals, collection-charities, &c. were applied to pay the people for working and cultivating the ſoil, almoſt the whole country might be made like a garden. How many thouſands who are able to work, lounge about doing of nothing! What might not theſe idlers, if properly employed, effect; when the few who at preſent do work, maintain themſelves and ſo many thouſands who labour not and are of no more uſe to ſociety than a pack of hounds—fit only to conſume!

In the year 1785, when an alarm of a famine prevailed, I was ſtruck with amazement to hear folks talking of wanting in a country like this; when I was certain I could increaſe the produce ten-fold in every pariſh I knew; and in many of them there were great numbers of idle people to be employed in improving the land. There need not be ten times as much more raiſed as there is, to enable the farmer to bring ten times as much to market; for the quantity of proviſions allowed

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at preſent for the ſupport of his family and labourers would be almoſt ſufficient for them, if he cultivated his farm according to my Improved Method; and whatever he raiſed more than is at preſent produced, might be ſent to market without any conſiderable deduction.

Indeed, were the land all put to its proper uſe, it is almoſt inconceivable how much might be raiſed. For inſtance, a quantity of nuts equal to that imported from abroad might grow on the land where the preſent fences ſtand; and every ten yards an apple or pear-tree might be planted. Some of the children of poor labouring people might gather them: ſuch an employment would certainly be preferable to idleneſs; for the ſooner youth who is doomed to earn his bread by his labour is put to it the better. As every man muſt fence his land in, and muſt have one end and ſide; every ten acres will have four hundred and forty yards of fencing; and, if planted ten yards aſunder, there would be forty-four fruit-trees. If every tree bore 5*s*. worth of fruit, the value of the whole produce would be eleven pounds—a decent rent for the land: and where the hedges

hedges conſiſted of nut-trees, the nuts might be ſold for a like ſum. Nut-trees are eaſily raiſed from cuttings, and they would form a ſtrong, beautiful and durable fence.

The ſize of farms having of late conſiderably attracted the attention of the public; it may be uſeful to enquire whether large farms or ſmall ones are the moſt uſeful to the community at large. And here we muſt not confine our views to the preſent ſtate of agriculture. The greater the number of people employed in cultivating the ſoil (if their labour be ſufficiently recompenſed), and the greater the produce from each acre, the better. Abundant crops are chiefly owing to the induſtry and ingenuity of man. It is of no importance to the landlord whether the farms be large or ſmall, if they be equally well cultivated, and his rent regularly paid. But the too prevalent practice of letting only large farms conſiderably affects the welfare of the public and of individuals; as it often extinguiſhes emulation, induſtry and habits of economy among the labourers in huſbandry, and prevents many a man of ſmall property from becoming

becoming a farmer. Where farms are ſo large as to require thouſands of pounds to ſtock them, a few hundreds are of no avail; and where the farms require hundreds, ſcores of pounds will not do. Therefore the poſſeſſor of ſuch ſmall ſums turns them into ſome other channel, becomes corn-jobber, beaſt-jobber, &c.; whence often ariſes a dangerous monopoly.

Indeed, if the land-owner be content with ſuch a rent as the tenant can continue to pay from his farm in graſs, one man might hold a county for a ſheep-walk. I knew an inſtance where a man and his two ſons, neither of them above fourteen years old, looked over five hundred acres at 10*d.* per acre. The land was ſo rich, that it would on an average carry four ſheep to each acre, one beaſt to three acres, and a horſe to five acres; and in the winter two ſheep to each acre; yet I have frequently heard the father complain for want of work; as one man could look after a thouſand acres with eaſe in the winter—although (the land being divided into ſmall paſtures, of from four to twenty acres each) the man and boys kept the fences

fences in order likewiſe. But were the landlord to call for an improved rent upon his land where the ſoil is proper for cultivation, twenty acres would probably employ four people in ſowing, reaping, thraſhing, &c. One hundred people then would be employed on the five hundred acres, inſtead of the man and his two ſons; and in harveſt time, two hundred inſtead of the three labourers. Now, if this land were again converted into paſture, the three working people would have all the reſt to maintain, and the ninety-ſeven become paupers, not becauſe they would not work, but becauſe they would have nothing to do, and would be moſt unjuſtly called idle and abandoned, while the father and two ſons are people of credit from their employment. Therefore it appears that ſmall farms, where the land is good in quality, are moſt beneficial to the community. In the time of harveſt, the wife of the ſmall farmer will put a helping hand for herſelf, though ſhe would not work for hire; the ſons or daughters will do the ſame; and the ſervant-girls and every branch of the family cannot refuſe to aſſiſt at reaping, when their miſtreſs ſets them

them the example. But if the farmer be a man of property, and keep ſervants in livery, ladies' maids, &c. theſe, by the tempting ſtories they tell of their manner of living in London, of going to the plays, &c. debauch the minds of the lower ſervants, who ſoon begin to ape the others, and conſider as beneath them the toils of agriculture.

If a gentleman wiſhes to employ ſome of his property in making experiments in agriculture, in improving the breed of cattle, &c. he ſhould keep ſuch an eſtabliſhment entirely diſtinct from the reſt of his houſehold, in a farm-houſe managed by a farmer, who ſhould work himſelf and have a ſervant or two under him. Inſtead of reſerving one large farm for ſuch a purpoſe, I ſhould adviſe him to have half a dozen conſiſting of about one hundred acres each; it might excite emulation among the different managers, to improve with the greateſt ſkill the land under their care. The ſteward, or ſome other intelligent perſon, might give the general direction, and ſuperintend the whole.

Where exceſſively large portions of land are allotted to one farm, the houſe, barn, ſtables,

bles, &c. muſt be at a great diſtance from ſome of the fields : therefore the produce muſt be brought a great way, and the manure carried back as far. One ſhepherd, indeed, would do for the whole ſo far as relates to ſheep : but the leading of manure, the going to and from plough, carrying the harveſt, &c. are attended with both loſs of time and expence.

It may be objected, that the thraſhing machine of the large kind, which ſaves ſo much time and money, will not ſuit a farm of ſmall extent. But I am of opinion, from the nature of the machine, that it may be conſtructed upon a ſmaller ſcale, and at much leſs expence, and worked with only one horſe. This will ſave the wages of one perſon; for one horſe will work without a driver; but two do not: and to attend and feed the machine, which requires no exertion of ſtrength, and may rather be conſidered as wholeſome exerciſe than toil, I would employ women, children and the infirm: and thus the very people who are at preſent maintained by pariſh-pay, might thraſh all the corn the land produces.

In the practice of agriculture recommended in this Work, more hands are neceſſary: therefore it is my wiſh to find them, and of ſuch a deſcription as are now idle, or at leaſt have not work to go to. I do not mean to attempt to make the man work who can live without it: but the poor people would find themſelves of more conſequence if they were in employ—and indeed ſo they actually would be. It is reaſonable that every one upon a farm, or in the pariſh, ſhould work for his living; and that according to the old ſaying, the farmer ſhould "keep no more cats than will mouſe." To be ſure, if a man works himſelf as a farmer, it is good: but it is much better where he ſo calculates his matters as to make every one that is liable to partake of his induſtry to earn their own bread and his likewiſe. The maſter of any extenſive buſineſs gains more money by his head than by his hands, in directing others to execute their taſk properly: but, to do that, he ſhould have a perfect knowledge of it himſelf, otherwiſe he will cut but a poor figure.

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Many will be deterred from dividing a large into ſmaller farms, by the ſuppoſed great expence of the buildings: but, from many well-formed plans, calculations and experiments, I am convinced it will be nearly the ſame, whether you erect one large houſe, barns and ſtables, &c. or fix on a ſmaller ſcale; and the cattle in a fold of a moderate ſize thrive much better.

There are, however, conſiderable tracts in the kingdom that ought to be in large farms, viz. ſuch as will not ſtand a rotation of crops; but muſt be frequently laid down with graſs ſeeds, and depaſtured with ſheep. Some which is not good enough for that, muſt be uſed for rabbits: and there ought to be from five hundred to fifteen hundred acres of land for a rabbit-warren. Theſe large farms are adapted to the breeding of horſes and cattle, require a large capital, and ſuit men who are fond of hunting, ſhooting, and other rural diverſions.

Where the land is only fit for grazing, and cannot be made more productive by the plough, it is of little conſequence how large the farms

are

are: but where the ſoil is of ſuch a quality that by the ingenuity and induſtry of man it will produce from 10*l.* to 20*l.* per acre, and employ from four to ſix people (men, women and children) in cultivating every twenty acres; there is great loſs both individually and to the public if the land is let in ſuch a manner that one man and his family manage two hundred acres; which they may eaſily do if it be left in graſs. But if the land-owner became ſenſible of its real value, and raiſed the rent; it would ſoon give employment to more people, and produce abundant crops. The price of land, as of all other things, would find its level; and gentlemen who happen to poſſeſs theſe eſtates might conſider themſelves as fortunate as if actually in poſſeſſion of a gold mine. At preſent rent may be from 15*s.* to 1*l.* 5*s.* per acre, and according to the common management, great enough. The tenant, if he makes from 2*l.* to 3*l.* per acre, is content; and from ſuch produce is no great gainer. Were the farmers in Eaſt Lothian in Scotland to manage their land in this way—one cow to four acres of land, two ewes and lambs to an acre—there would

would be no paying the landlord 4*l.* per acre, though grain be there ſold cheaper by 4*s.* per quarter. They have indeed five roods to an acre, labour is lower, and they pay no poor-rates; as the poor in general work for their living. Were good land ſcarce in England, a plot of it would be more highly valued. In Aberdeenſhire, in Scotland, there is land let at from 3*l.* to 8*l.* per acre. The produce thereof is not more nor ſo much as that of a great many lands in England would be, were they cultivated in the ſame manner, and with equal induſtry. If the crops raiſed by improving ſuch lands only maintained the poor without the preſent abſurd poor-laws, it would ſave an immenſe ſum of money now ſquandered on removals, lawyers' fees, doctors' bills, expences of officers, and now and then a good feaſt, which, in ſome pariſhes ſwallow up one half of the contributions levied on the inhabitants for the ſupport of the poor. Where is the evil then to the farmer if he gives his landlord 4*l.* per acre for land, and makes 20*l.* of it? He is as well off as the man that gives 2*l.* and makes 5*l.* per acre; and he is relieved from the heavy burthens

burthens for maintaining the poor; as the converting paſtures into arable fields creates both work and meat for them.

In Scotland, the labouring people have little or no money for their labour. I do not like that: I would have every man to think himſelf independent by the fruits of his labour; for if the man thinks himſelf great, he really is ſo. The Scotch labourer has a cow and a pig kept, is allowed a certain quantity of wool, of flax, and of corn of different ſorts, ſome land ſet with potatoes: In fact, he is maintained like a horſe or ſome animal for uſe; he will not want; but he has no opportunity to raiſe himſelf from his low ſtation, and is therefore apt to leave his home and ſeek for independency, which he very frequently obtains—a great encouragement to emigration.

It is uſual for the women in Scotland to reap the corn; and their allowance is one pint of milk and one pint of oatmeal porridge in the morning, one pint of beer and a piece of bread at dinner, and at ſupper the ſame allowance as at breakfaſt, but no money. Theſe cuſtoms may be derived from times when the produce could

could not be ſold, and it ſuited the farmer to pay in kind: but even that is better than not employing the poor at all. The poor in Scotland are employed in ſpinning, &c. and they make their own clothing in the winter.

The poor in England, in time of harveſt, go a-gleaning, which in fact is little better than going a-ſtealing; for, when they gather corn amongſt ſtooks, the temptation is almoſt too ſtrong to refrain from taking from them—a very bad example for children. When inured young to theſe petty thefts, it has a material influence on their conduct during life. The firſt time a man does a diſhonourable or unjuſt deed, he feels uncomfortable: but cuſtom will make it eaſy to him. Now, it will become rather natural for the reaper to leave ſome corn when his wife and children are gleaning after him upon the very land he has reaped; and his wife and children are allowed to glean, becauſe he is a reaper—a very juſt cauſe why they ſhould not. This cuſtom ought to be aboliſhed; as it prevents the women in England from becoming reapers at 1*s.* or 1*s.* 6*d.* per

day

day, when they can gather wheat to the amount of 3*s*. per day.

Reſpecting agreements or leaſes betwixt landlord and tenant, it is almoſt impoſſible to give any general rule. For ſmall farms leaſes are leſs neceſſary ; but a large one cannot well be let without a leaſe. Upon a ſmall farm where land is good, a man's improvements ſoon come round: and if tenant and landlord diſagree, either of them is eaſily accommodated ; but upon a large farm it is quite the reverſe. It would not be worth a man's while to fix himſelf upon a large ſcale for a year or two, and it would be attended with great expence and loſs to move from any great diſtance with large quantities of ſtock for any ſhort time. Beſides, the plans of improvements upon a large farm are more extenſive, and it is longer before the money expended is refunded, eſpecially upon poor land. But, undoubtedly, the tenant upon either a ſmall or large farm ought to have a ſecurity for his property ; and there ought to be an agreement to allow him a proportionate recompence for every improvement by which he has raiſed the

land

land above nature—as by giving it more manure than could be made from the produce of the farm. When the manure produced upon the farm is the property of the farmer, and he is by the terms of his leaſe compelled to ſell it to the coming tenant at a fair valuation, he often endeavours to make more manure the laſt year than any other; and by that means benefits the eſtate: if, on the contrary, he is not paid any thing for it, he will do every thing in his power to prevent any future improvement upon the farm, as from ſome cauſe or other he will fancy himſelf ill uſed upon leaving it.—For all under-draining properly done, and for new buildings which were neceſſary for the farm, the tenant ought to be allowed an indemnification proportionate to the number of years leſs than twenty he may have had the uſe of them. He ſhould likewiſe receive an allowance for quick fences, the planting of orchards, or of aquatics and other uſeful trees in proper places, on producing fair bills, with receipts to them, of the expences—provided he leaves the eſtate without committing wilful waſtes.

On the other hand, the landlord who enters into ſuch a covenant with his tenant, may reaſonably expect to have his farm re-delivered upon terms equally fair and reaſonable. If the tenant has committed any waſte, he ſhould be obliged to make good all damages. Now ſuch mutual conditions would do away many abſurd reſtrictions now laid upon the tenant; as it would be his intereſt not to injure the farm, becauſe he muſt pay the landlord for damage wantonly done; and the latter would have no reaſon to check the farmer's experiments and improvements, —to the great encouragement both of ingenuity and induſtry; for gentlemen's agents are very apt, from over anxious care of their lords' eſtates, to reſtrict tenants in ſuch a manner that they are little better than an engine-horſe, who can go over only a certain circle of ground. I have known an agreement made to lay a certain quantity of lime on land; where, if the land had been mine, I would have given more money than the lime coſt that it might not have been laid on. Sometimes the farmer is tied down (not to mention many other diſadvantageous

vantageous modes of culture which the wiſdom of the ſteward obliges him to follow) to plough and ſow crops of corn only four years in ſix, and no turnips or clover.

As to reſtricting a man from ploughing up graſs-land without leave, it is certainly proper until you ſee what uſe your new tenant makes of the land he does plough: but if he be induſtrious, and till well, I would ſuffer him to plough every inch if he chooſes; as it certainly will in future make, upon good arable land, from one pound to three pounds per acre difference in rent to the landlord. However, the nature and ſituation of the farm muſt be previouſly well conſidered.

Having treated of the different modes and operations of farming according to the Proſpectus, and in ſome inſtances added new matter, I beg to conclude with returning my grateful thanks to all ſuch as have encouraged this Work. I have endeavoured to point out the method of putting the land of different qualities to its proper uſe; ſo as to add equal happineſs to the rich and the poor, according to their reſpective ſituations in life. As to happineſs,

all

all honeſt and induſtrious men may enjoy an equal ſhare with the great and noble; for I am perſuaded that the man who aſſiſts in raiſing the fruits of the earth is more independent than he that conſumes them: and if grandeur has its pleaſures, it is frequently imbittered by numerous anxieties and diſappointments.—As to the ſubordination of one ſort of people to another, it is for the reciprocal good of the whole community.

Every man ſees how neceſſary it is to govern his own family: and as neceſſary is it that he himſelf be governed; as without good order no one can peaceably enjoy the fruits of his induſtry, and a proper ſhare of the fruits of the earth, nor derive an equal benefit from the improvement of it.

APPENDIX.

APPENDIX.

N° I.

Some Remarks concerning Paring and Burning—making Straw into Manure—and the proper Quantity of Seed to be ſown.

IN the courſe of this Work it may have been obſerved, that I ſeem in ſome inſtances to contradict myſelf. The cauſe is—there are no general rules without exceptions. For inſtance, I am very much attached to paring and burning, and, from my own obſervations and experiments, am convinced no injury can ariſe

ariſe from it. Therefore I ſhould pare and burn all ſward-lands intended to be ploughed up and converted into tillage, and the deeper it is burned the better; for which reaſon I ſhould uſe the plough inſtead of the ſpade. I do not think it neceſſary, on old ſwards, to burn the ſods down to a dead aſh: but take care to burn the graſs, and ſufficiently ſmother the ſods, ſo as that they might be properly pulveriſed. Thus would be deſtroyed the worms, grubs, &c. and likewiſe their eggs, or broods of young, ſo pernicious to crops of every kind.—But as this Work is intended for the uſe of all countries and all conditions, care is likewiſe taken to give directions, how to improve land where the tenant is reſtricted from paring and burning, viz. by ploughing up ſwards, and ſetting potatoes; as I give it as a rule by ſome means to pulveriſe the ſoil as ſoon as you can, after land is broke up.

My frequent repetitions in recommending the making ſtraw into manure, and laying it on the land, may have ſtruck ſome readers:

theſe repetitions aroſe from my conviction of the great loſſes occaſioned by the too general neglect of that ſalutary practice.

I likewiſe repeatedly recommended great quantities of ſeed for all crops; for I do not recollect an inſtance of land being injured by too much manure, or a crop by too great a quantity of ſeed having been ſown. I have, indeed, known a good crop from thin ſowing. In one inſtance, where four Wincheſter buſhels of barley had been ſown broad-caſt on four acres of land, the produce was twenty-four quarters, eight Wincheſter buſhels to the quarter, delivered at the kiln: but I have ſince that time known five hundred inſtances to the contrary. A friend of mine once ſowed twelve buſhels of oats on one acre of land; and the produce amounted to fifteen quarters—the greateſt I ever heard of. It is however poſſible to ſow too much; but it comes ſo near to a man's pocket, that it rarely happens.

There have been many experiments tried with dibbling, drilling, and broad-caſt; and the broad-caſt has generally produced the moſt. The cauſe is evident: more ſeed was

ſown by the broad-caſt; for by the broad-caſt method the land is not rendered more fertile, nor is the ſeed more properly depoſited in the ground; but there is more thrown upon it, and the land more generally covered.

N° II.

Of the proper Manner of depoſiting the Seed of Wheat, Peas, Turnips, Rape, &c. in Drills, &c.

ON reviſing the different Sections of the Work, I find I have given general directions for making drills; but not for depoſiting the ſeed in them. It may therefore be neceſſary to acquaint the reader, that I have tried every method of depoſiting the corn in drills, and find the broad-caſt the moſt correct. For, where the drills are made according to my directions, almoſt every ſeed will fall in the proper

proper place; and the harrows, or thorn-harrow, will remove any chance grain that may remain on the ridge or ſide of the drill.

I have hitherto been a great advocate for the grains of the corn to be diſperſed ſo that every one might fall ſingle: but I have altered my opinion. I am now convinced, that if, in ſowing the *winter* crops, four wheat-corns be put into the earth together in one hole, the crop would, on an average, be better in all ſeaſons, than if the grains were divided, and covered the ſame ſpace of ground ſeparately. With reſpect to corn ſown in the *ſpring*, I ſtill firmly adhere to my former opinion. But the wheat ſown in *autumn*, and deſtined to bear the viciſſitudes and ſtorms of winter, may be greatly benefited by growing in lumps or bunches, as the plants will thus mutually give and receive ſhelter and warmth. I firſt attended to the above circumſtances laſt autumn, when at Mr. Coke's in Norfolk. On examining the ground that was then dibbled with wheat, I found in ſome holes ſixteen grains, and in others only two. When I ſaw this, I concluded there would be many ſhort heads of wheat.

But

But during the day Mr. Coke ordered the thraſhers to throw a great many ſheaves of wheat from the mow; and, to my very great ſurpriſe, I do not recollect ſeeing wheat with heads ſo fine and of ſo regular a ſize. I then made it my buſineſs to examine the *ſtubbles*: and in the ſtubble where apparently only one grain had fallen, I did not find that ſuperior ſtrength I had expected. During the winter I have made ſeveral obſervations in fields of wheat; and I frequently noticed that, where a ſingle grain had fallen, the plant appeared weak and ſtarved; but where three or four had fallen, the blades were fine, broad, healthy and vigorous. In like manner, clumps of trees in plantations get up much quicker than a ſingle one: and I have often obſerved, that when plantations, after they have grown to from fifteen to twenty feet high, have been thinned, and the under branches lopped off, they make but ſlow progreſs after. Therefore it appears very plainly, that trees growing in clumps ſhelter one another: and I am of opinion that wheat-plants ſimilarly ſituated do the ſame. But I would not wiſh the reader

to

to infer from what I have ſaid above, that I approve of ſixteen grains in one place; but only of four inſtead of one.

On drawing up the ſtubble, I have likewiſe diſcovered that wheat depoſited deep tillers very little. I attribute this to the root's being too near the ramel or dead earth, ſo that it ſtands in a poor cold ſituation, has its food to ſeek upwards, and generally throws out another root near the ſurface.

In drill-peas, by thick ſowing in the extreme (viz. four buſhels inſtead of three) the peas will be ſix inches high, when in the drills ſown with three buſhels they will be only four inches high. I never procured however, on an average, a more abundant crop of peas by ſowing thick. In ſowing in drills tares to cut, or any other ſort of green fodder, it is neceſſary to ſow very thick.

I am of opinion, I could dibble an acre of wheat to raiſe as much wheat as the land could bear: but, if the ſoil were good, I would ſet every three inches.

I approve of ſowing the fallow-land under furrow; with a boy to depoſit the ſeed at *6d.* per

per acre. This might be done by the drill-plough: but the boy would do it better and cheaper; for the delay in the ploughman filling the hopper, and the ſtoppages he would undergo on that account, would prevent more labour than the boy's wages would come to. It will probably be ſaid, Where are theſe women and boys to be got; and who is to teach them all theſe things? I anſwer: A well regulated farm ſhould be like a good ſchool. If proper regularity were eſtabliſhed in farming, the boys would teach one another, and the maſter have much leſs trouble than he who does not attend to any regular method. For inſtance, the ſchool-maſter who has twenty boys, and has them to beat continually, works very hard. So does the irregular farmer. I ſaw a farmer in the month of Auguſt laſt, one very hot morning, by five o'clock, ſtripped to his ſhirt ſtubbing up thiſtles with a hoe, to make way for the plough; they having grown ſo ſtrong, that the plough could not paſs for them. The farmer being preſſed hard by the ploughman, I do not recollect ſeeing a man work harder. The thiſtles were full of

ſeed

ſeed. Therefore there was little doubt of his having a ſucceeding crop. So it might be truly ſaid, the farmer had got his work ſet.

N° III.

Of the Smut in Wheat.

FROM the experiments detailed in Section IX. of the foregoing Work, it plainly appears that ſmut ariſes from a defect in the ſeed. The following is an additional proof. In the year 1793, I ſowed on a piece of land ſeed which I had procured from Burill in Cambridgeſhire, and the produce proved ſmutty. It having coſt a very high price, I ſowed the produce the year following. I chamberlied one part, and prepared another with arſenic-water; but the day we finiſhed, I ordered to ſow one land without the preparation. The part of the field ſown with wheat prepared was entirely free from ſmut, and the other part very much affected indeed.

N° IV.

N° IV.

Of preſerving Sheep from the Rot.

IT is neceſſary to obſerve, that in wet ſeaſons, or on any ſuſpicious grounds, when ſheep are more liable to be attacked with the rot, it is very dangerous to keep changing them about —a practice very general in ſome parts of the kingdom. The leſs they are moved the better. When you put as many ſheep into ſix acres as ſixty would keep for a continuance; it obliges them to eat every part of ſo ſmall a paſture: and when land is perfectly ſound and dry, I doubt not its being equally profitable—perhaps more ſo. But if land be wet, that cannot be the caſe; as ſuch a number will tread it to dirt in a very little time. I have reaſon to believe that ſheep, by nature, do not chooſe to eat land in parts which cauſe the rot. The rot, indeed, is more frequently occaſioned by

ſcanty

ſcanty paſtures—not but there are ſome lands would rot in almoſt any part of the paſture.—For want of proper diviſions being made, thouſands of ſheep are deſtroyed by the rot; as the greater part of the paſture is perfectly ſound, and ſome ſwampy part is the cauſe of the diſeaſe.

N° V.

Some general Directions relative to the planting Trees.

I HAD thought it unneceſſary to ſay any thing concerning planting, in a Work intended for the practical farmer: but being requeſted by ſome gentlemen who have been ſo good as to patronize my undertaking, to publiſh what obſervations I may have made on that ſubject; I ſubmit the following ſhort and general directions to the conſideration of the reader.

The land ought, if in graſs, to be pulveriſed by paring and burning, and ſet with potatoes, ſo that, the earth being looſened, the roots of the young trees may ſpread themſelves in proper directions, both as to ſpace of ground and the food required for their ſupport. It is neceſſary to obſerve, that when a tree is firſt planted, were it rammed about like a poſt, its progreſs would be impeded. Therefore cattle ought not to be ſuffered to depaſture and tread the ground round young trees; for their roots will not admit of much weight of any ſort.—Conſequently the ſoil ought to be pulveriſed for a ſpace of years, ſufficiently for the tree to puſh forth all its ramifications in ſuch a manner as nature directs.

Trees ought not to be planted deep: but it is impoſſible to give particular directions as to the proper depth; as ſo much depends on the ſoil and the ſize of the trees.

Trees intended to bear fruit ought not to have a tap-root, which ſhould be deſtroyed by cutting it off. It is a very good way to lay a few bricks like a floor at the bottom of every fruit-tree, and round the bricks ſome rubbiſh

(ſuch

(ſuch as old bricks broken in pieces) to keep the land light about the roots, ſo that they may freely ſpread out laterally to ſeek their food.—No tree having a tap-root will be productive in fruit: On the contrary, in trees intended for timber the tap-root ought to be preſerved, and encouraged as much as poſſible. In every other reſpect they ſhould be treated as fruit-trees, except the bricking at the bottom.

Trees of every deſcription ought to be well ſheltered. Shelter is as neceſſary to young trees as food. We well know from practice and obſervation, that clumps of trees get up much quicker than ſingle trees, on ſpots where the ſoil is of equal goodneſs. Likewiſe in the ſeedling-bed I would raiſe a great many more than I intended to plant, and only ſet the beſt; as I have generally found the beſt plants on the ſeedling-bed ever after to retain their ſuperiority: and had I trees to buy, I had rather have the firſt or largeſt trees from the ſeedling-bed for their price, than the culls or the after-drawing for nothing. This obſervation holds good with reſpect to every thing I have practiſed.

N° VI.

N° VI.

Deſcription of a Churn not in general uſe.

THIS churn is at preſent made oblong, and the daſhes are three in number, with holes in them. But I am of opinion, that if the churn were a long ſquare, from two to three feet wide, and from four to five feet long, it would anſwer the purpoſe better, and at a much ſmaller expence—The daſhes to be ſlips of board with holes in them about an inch in diameter. The boards ſhould be from four to ſix inches broad, and the length proportioned to the length of the churn. Theſe boards to be ſo fixed, as, in turning round, to move every part of the cream twice. To do this, the middle piece or axle-tree muſt have eight ſides, and ſlots driven through them. Daſhes of this ſort would not carry the butter round with them; but would leave it in the corners, ſo that

that the churn might be worked with greater eaſe. This churn ſtands ſtill, and the daſhes turn within the churn like a grindſtone. To effect this, two pieces of wood muſt be fixed in the inſide of the churn, for the irons or gougings to turn on. In the inſide of the churn there muſt be fixed a piece of iron, againſt which the end of the gouging is cloſely preſſed in fixing the handle. Without this precaution the cream will run out, when you fill the churn as high as the axle. There muſt be a female ſcrew in the inſide of the gouging; and the handle you turn the daſhes by muſt be ſcrewed into it, on the outſide, ſo as to draw the gouging-end ſo cloſe as to prevent the cream from running out. The principal advantage ariſing from the uſe of the churn deſcribed above is, that you may give it air ſo as to prevent the flowing of the cream, which often ſpoils the taſte of the butter, and likewiſe greatly increaſes the labour, and retards the operation.

There are other conveniences attending the uſe of theſe churns. As they are entirely open at the top, the daſh may be taken out, and the whole

whole machine kept quite clean and ſweet.—And by fixing a wheel on the outſide, like that of a malt-mill or of the fan uſed for winnowing corn, great quantities of cream might be churned by one perſon.

The taſte of the butter made from cream taken from milk of cows that have eaten turnips, or any other ſtrong food, is exceedingly diſagreeable.

I have, ſince writing that part of the foregoing Work which treats of the management of the dairy, found out, that if the butter-milk be kept until it be ſour, and put into the churn in the proportion of about one third of the ſour butter-milk to two of the new cream, it will remove the unpleaſant taſte, and moreover cauſe the butter to come ſooner, and in greater abundance.

N° VII.

Deſcription of Mr. Sanxter's Plough for Paring of Land—and its Uſes.

BEING lately at Horſeheath, I called on Mr. Sanxter, an ingenious farmer of that place, to view his newly invented plough for paring land which is to be burned. The operation of paring was formerly performed by men, by what is termed breaſt-ploughing: but the work is done much better and quicker by Mr. Sanxter's machine. He is now ſoliciting a patent for it: and from the trial I ſaw made of it, I am ſo convinced of its great utility, that I take the liberty to recommend it to all thoſe engaged in agriculture. The plough is very ſimple in its conſtruction, and will do its work with one good horſe and a man. It will pare a ſod from nine inches to fifteen inches width, as the ploughman chooſes. An induſtrious ploughman

ploughman might pare with it two acres per day; but I ſhould not attempt that, as, the furrows being narrower, the plough may be made to ſet great part of the ſods upon the edge; which will cauſe them to dry more quickly, and burn the better. Although ſome of the ſods may fall with the graſs-ſide upwards, there will be a ſufficiency to begin the fires with; and when the heaps burn ſtrongly, ſome of the leſs dry ſods may be gradually added, and will in turn be reduced to aſhes. It is the opinion of ſome, that it would be better if the ſods could be only ſmoked and ſinged. Of this I am not certain. On the contrary, I know from experience that burning earth of any deſcription makes it more fertile. By weighing earth, then burning it, and afterwards laying it in the open air, it has been found that it retained its former weight; and when the earth has been laid on land to burn, it makes that ſpot of ground remarkably productive. One great objection to paring and burning has hitherto been, the expence and labour attending it.—But with Mr. Sanxter's plough you may quickly and cheaply pare a number of acres of land—

and

and that at the proper time for doing the work. At preſent, from the frequent want of men who are able to pare, you muſt wait until they have finiſhed ſome other farmer's field, and ſometimes loſe the ſeaſon for the intended crop.

Another advantage of Mr. Sanxter's plough is, that you may cut the furrows what depth you like; for ſhe acts like a joiner's plane. Indeed I know of no objection to her, but that ſhe cannot be worked ſo eaſily on unlevel land, ſuch as where large ant-hills are. Such as are of a moderate ſize may be ploughed up with a common plough; which I like better than another machine of a more complex conſtruction, which Mr. Sanxter has invented to cut them up: for the preſſure or power being ſo very great, it is likely to put the ant-hill plough out of order; and then the ſods are obliged to be cut or chopped in pieces by men, before they can be moved. But I ſhould act differently with the land that is full of ant-hills. I ſhould pare it with Mr. Sanxter's paring-plough as well as I could, and then take a common plough and plough the ant-hills off, and burn them with the ſods, or more properly after the

ſods are burnt, throwing them into the hot aſhes, which will be found of eſſential uſe, and the expence is but ſmall. The harder the land, the better the paring plough does her work.—The reaſon is, as ſhe reſts on a foot to give the depth, if the land bend and deceive the foot, the plough will not take hold: but when all the land is ſoft alike, it is of no conſequence.

Now, after mentioning ſome of the great uſes of this plough for paring and burning, it may not be unneceſſary to remind the reader of my method of cleaning ſtubble-fields, where this plough will become even of more general utility than in paring ſward-lands. Inſtead of mowing wheat ſtubble, you may with this plough cut it at one operation; and if the ſeaſon be dry, it may be burnt. But I very much approve of my former method of leading ſtubble off and making manure of all the refuſe ſtuff. All ſtubbles from white crops ought, the firſt ploughing, to be ploughed with the paring-plough; and all drill-crops with the ſcarifier, the firſt operation.

I have been trying at a plough of this kind for ſome time, but never could obtain it. The expence of the plough will be four guineas; and

and if by chance any part breaks, it is very eaſy to repair it. It may aſked, If the plough be ſo ſimple, why ſo high a price? I anſwer: The obtaining a patent is attended with great expence; and a man ought to be allowed ſome recompence for his ingenuity.

N° VIII.

How to cure Corns in Horſes' Feet.

I OBSERVE that I have neglected to give directions how to cure horſes afflicted with corns. The reader, then, will be pleaſed to take notice, that it is done by keeping the feet moiſt, and ſhoeing them in ſuch a manner that the ſhoe may not preſs on the part affected; for corns are cauſed by a bruiſe, and become worſe and worſe from repetitions of the ſame cauſe. The moiſter the feet are kept, the better; as a horſe's hoof grows ſo very quickly as to confine the bruiſed part, and cauſe

cauſe it to feſter; and the matter will break out at the top of the hoof, if vent be not given it below by paring properly out; which part of the proceſs is known by every blackſmith. It is only neceſſary to cut off with a paring-knife the part aggrieved, which is at the corner of the heel, ſo as to get it near the quick, but not to raiſe any blood. That done, cut off the outſide of the hoof in a ſlanting manner, ſo that the corner may not bear any weight by the ſhoe reſting upon it. Very great care muſt be taken to pare the outſide of the hoof to a great nicety, ſo that the end or the corner of the ſhoe preſs not upon the ſore or bruiſed part. By attending to the above, I have worked a cure of very bad corns. By ſhoeing in the manner I have directed, no ſtones or dirt can lodge in the ſore part.

I found out this cauſe and cure of corns from having them on my own feet. By taking care to let no weight preſs upon them, they became eaſy, and at laſt went totally away. I got them by holding ſheep by the head betwixt my knees. The ſheep ſtruggled and trod on my toes, and the bruiſed parts were affected with corns. N° IX.

N° IX.

Thoughts on the Uſe of the Sow-thiſtle—Deſcription of a remarkably fat Sheep.

I HAVE not written upon Cichory which is uſed as green food for animals, and very profitable for the purpoſe; but it will not make hay to profit. I am indeed of opinion, that other weeds, if grown and uſed as green food, would be as profitable as cichory; but not having had an opportunity to try the experiment, and having through the whole of this Work laid it down as a rule to give nothing to the public but what I have myſelf experienced and uſed, I omitted to mention many probable improvements. I cannot, however, refrain from ſaying a few words reſpecting the ſow-thiſtle, ſo common in all worn-out lands, and a very obnoxious weed in what is termed run crops. It has often ſtruck my mind, that, on account of its milky nature, it would become

come one of the moſt fattening plants the earth produces, were it properly cultivated. When taken young, and cut or broken, it produces ſomething like cream; and I have obſerved many animals to like it in preference to every other plant now in vogue. Sheep when in clovers, &c. will feed upon it ſo greedily as to eat the very roots. Pigs likewiſe prefer it to almoſt any other green food. Rabbits will breed more ſpeedily when fed with ſow-thiſtles, than with any other food I know of, except dandelion; which is of the ſame nature, and is now ſold in Covent-Garden market to the breeders of tame rabbits, to make them take the buck more readily. A man of my acquaintance, who was allowed better ſkill with ſtallions than the general part of mankind, uſed to ſearch for ſow-thiſtles and give to his horſe to make him ſerve mares more readily. When he could not procure ſow-thiſtles, he fed him with new-laid eggs and milk, or cream if he could get it; but preferred ſow-thiſtles or dandelion.

We have a well-known and deciſive proof of the nutritive properties of the ſow-thiſtle, in

in the fat wether-ſheep fed to an amazing ſize by Mr. Trimnel, of Bicker Fen, near Boſton, Lincolnſhire, upon fen land. This ſheep was bred by Mr. Hutchinſon, in Hail Fen, from a ram bred by Mr. Robinſon, of Kirkby, near Sleaford.

He never ate any corn, oil-cake, &c. but fed wholly upon graſs and herbage. Being turned with many other ſheep into a field of clover, this ſheep was obſerved firſt to ſearch for the ſow-thiſtles, and would eat no other food whilſt any of them could be found in the part of the field that was hurled off ſucceſſively, a little at a time. None of the other ſheep that fed with him ſhewed any liking for the ſow-thiſtle. A ſmall hut was erected for him in the field, to repoſe under in hot weather; and when the part that was hurled off became bare of food, his attendants (being guided by his propenſity for ſow-thiſtles) gathered a quantity for him, of which they gave him, at ſtated hours, three times a day, from two to five pounds at a meal.

Standing on his feet, he meaſured only two feet ſix inches high: he was weighed once a month

month, and weighed alive twenty-ſix ſtone, at fourteen pounds to the ſtone. He gained only one pound the laſt month. As it was thence concluded that he had got to the top and was quite ripe, and might poſſibly loſe weight the next month, he was killed on the 13th day of October, 1791, by Mr. Iſaac Lumby, of Bicker, being then a four-ſhear, or four-year-old ſheep.

The ſkin, hung up by the noſe, meaſured ten feet two inches, from the point of the noſe to the tip of the tail, and was ſold for ſeven ſhillings and ſix pence in the common courſe of buſineſs.

The carcaſe meaſured five feet, from the noſe to the tail; the rump or cuſhion eight inches and a half in depth; plate or fore-flank the ſame thickneſs; breaſt end ſeven inches; one yard five inches and a half round the collar, and weighed ſixty-ſeven pounds a quarter, Avoirdupoiſe weight.

The legs were eſtimated at forty pounds weight each; but, if cut haunch of veniſon faſhion, would have weighed fifty pounds each; for which the proprietor, Mr. Lumby,

was

was offered two ſhillings a pound; ſo that the two legs only, would have brought ten pounds.

N° X.

Of the Advantages ariſing from keeping Bees.

HONEY-BEES are worth every perſon's attention; as their produce ariſes from a part of the produce of the land which cannot be made profitable by any other means, (viz. the bloſſom of every plant in the meadows, the bloſſom of every ſort of grain, and the flowers in the garden), and might be brought to a very conſiderable value; eſpecially now ſugars are at ſuch an enormous price. For the management of bees, I refer the reader to Mr. Wildman's treatiſe, in which he will find every neceſſary direction.

Bees ought to be ſet near to their food, viz. the ſort of food they like beſt; and moved from time to time as their food gets ready;

ſuch as rape firſt, clover next, then beans, and buck-wheat laſt. My reaſon for particularly remarking this is: A gentleman of veracity, who had a great number of bees, told me that he obſerved them to leave their home early in the morning, and not to be ſeen all day. It was in the time of beans being in bloſſom. There was a large field of beans many miles from him; and remembering bees to be in great numbers in bean-fields, it ſtruck him he would dredge them with flour as they came out of the hive. He did ſo, and rode to this bean-field, and there diſcovered a number of his bees. Now, it is eaſy to conceive, that to theſe induſtrious creatures, which ſpend no time in idleneſs, it muſt make a very eſſential difference in the gathering of the honey, wax, &c. to be able to fly only once a day many miles, inſtead of having the neceſſary materials at their door. What numberleſs misfortunes may happen to them, when returning home heavy laden, from heavy ſhowers of rain, from hail, high winds, &c. which are very deſtructive to thouſands of them! The one part of the day may be rainy, the other

fine

fine. Now, if their food was at home, they would readily go out and fetch what they want; but when at a great diſtance, it is impoſſible.

Every thing that is ſweet to the ſmell is found to be what they delight in, ſuch as mignionette, lavender, and every ſweet flower you can think of. Where bees are kept a garden of flowers becomes of great value. Indeed, the management of bees would be an amuſement to many hundreds of people who are at a loſs to know how to ſpend their time; for the management of the garden, by raiſing flowers of the moſt early and lateſt kind, gathering the ſeeds, and ſowing, planting, and tranſplanting, &c. would make the employment continual, like the management of a farm. Then how delightful it is to ſee theſe induſtrious creatures at work; which you may eaſily do by having a flat-topped hive, with a ſlider! As the bees always fill the upper part of the hive firſt; if you draw the ſlider, and ſet a glaſs over the opening, you may keep taking away honey by ſmall quantities, until ſuch time as it is neceſſary that the bees begin to

lay

lay it up for the winter. I have heard Mr. Wildman ſay, he has taken ſeventy pounds of honey from one hive of bees during the ſummer; and they have had a ſufficiency for themſelves. Mr. Wildman ſells his honey at 3*s*. per pound. What immenſe ſums of money might be raiſed by theſe induſtrious animals, and by a ſet of people who are at a loſs to kill time, and aſſiſt neither in agriculture nor our manufactures! Great part of them are much addicted to two things I diſlike—tea and ſcandal—the other part to tea and theft—pilfering their neighbour's hedges, orchards, hen's neſts, &c. Now, I am of opinion there is uſeful employment for every deſcription of people; and when a perſon ſays he has nothing to do, the more ſhame for him! The taxes are daily complained of. Does not the reader think the honey-bees would pay a conſiderable proportional part? I can only ſay I am ſorry for thoſe who will not attempt to reach the ſummit of a hill that only appears high.

THE END.

APR 14 1936