

The inrichment of the weald of Kent. Or, a direction to the husband-man, : for the true ordering, manuring, and inriching of all the grounds within the wealds of Kent, and Sussex; and may generally serve for all the grounds in England of that nature: As, 1. Shewing the nature of wealdish grounds, comparing it with the soyl of the shires at large. 2. Declaring what the marl is, and the severall sorts thereof, and where it is usually found. 3. The profitable use of marl, and other rich manuring, as well in each sort of arable land, as also for the increase of corn and pasture through the kingdome. Painelessly gathered for the good of this iland [sic], by a man of great eminence and worth, but revised, enlarged, and corrected with the consent, and by conference with the first author. / By G.M.

Contributors

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WAY TO GET
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MARKHAM

1653-51







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MARKHAM, G.

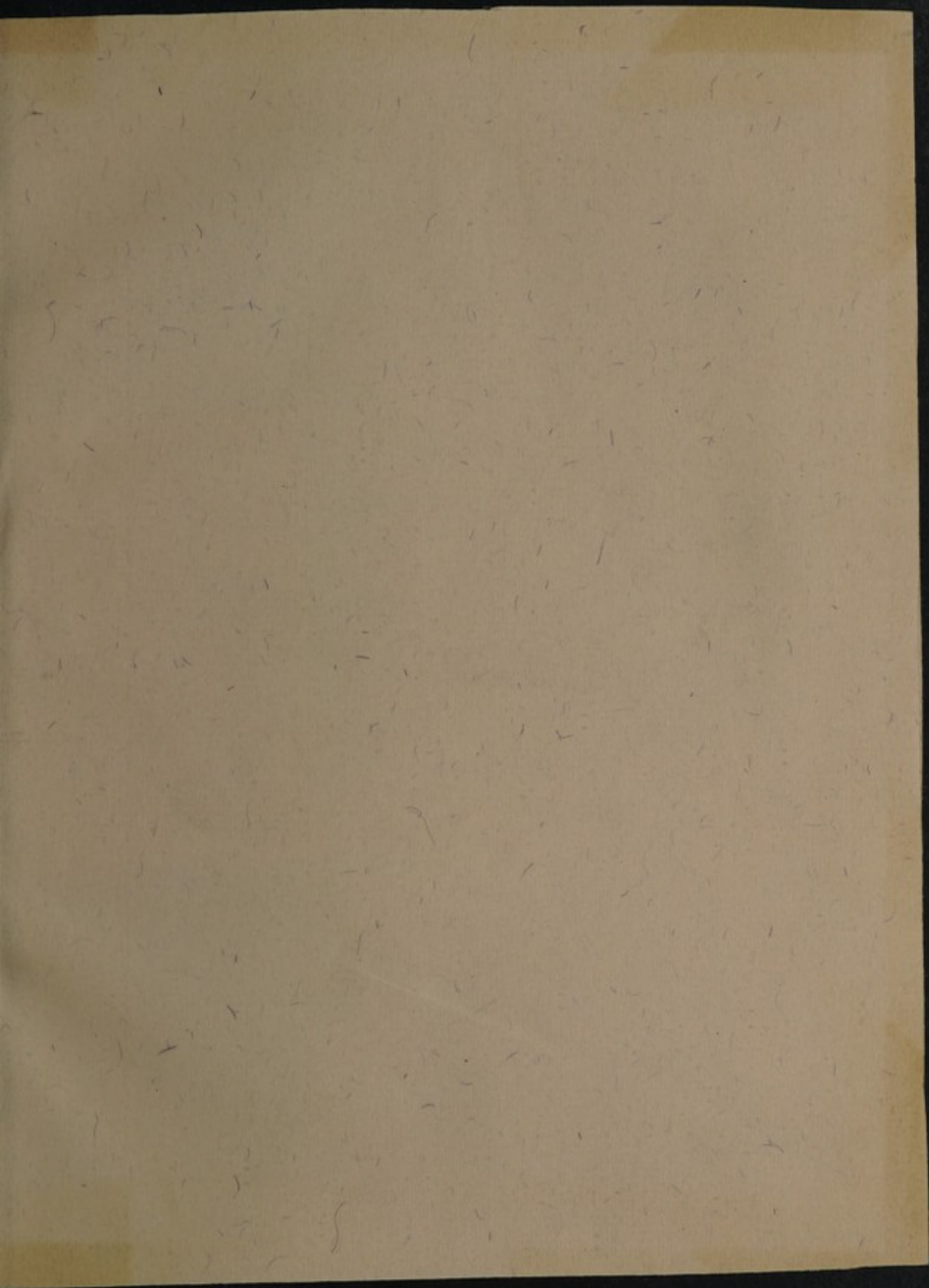
A way to get wealth

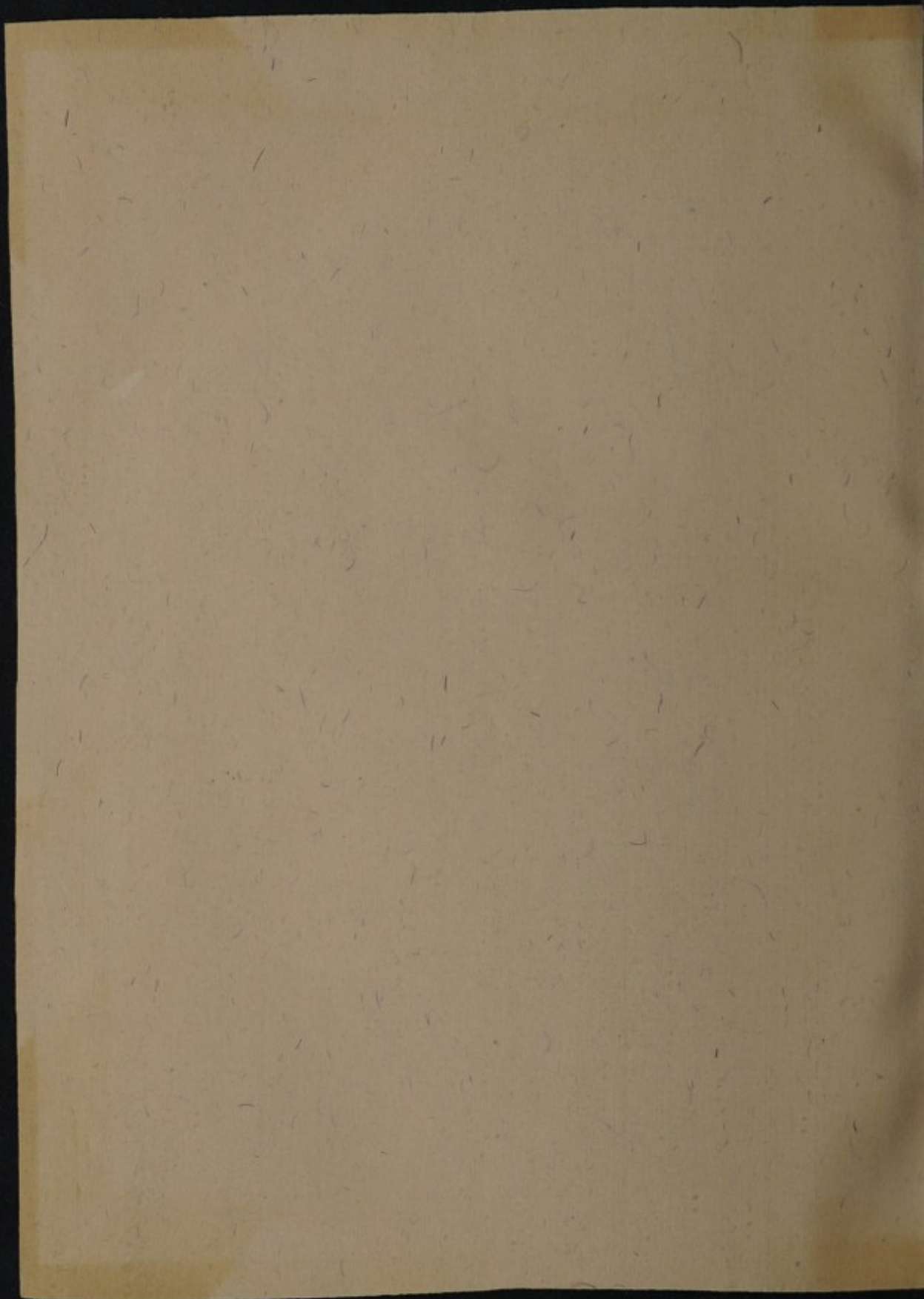
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INRICHMENT
Of the Weald of
KENT.

OR,

A Direction to the Husband-man, for the
true Ordering, Manuring, and Inriching of all the
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and may generally serve for all the Grounds in
England of that nature: As,

1. *Shewing the nature of Wealdish Grounds, comparing it with the
soyl of the Shires at large.*
2. *Declaring what the Marl is, and the severall sorts thereof, and
where it is usually found.*
3. *The profitable use of Marl, and other rich manuring, as well in each
sort of Arable Land, as also for the increase of Corn and Pasture through
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By G. M.

LONDON,

Printed by *W. Wilson*, for *E. Brewster*, and *George
Sawbridge*, at the Bible on Ludgate-Hill, neere
Fleet-bridge. 1653.

THE
INRICHMENT
OF THE WORLD OF
KENT.

A Direction to the Husband-man, for the
more Orderly Manner, and Increase of all the
Crops within the World of Kent, and the
County of Maidstone.

By the Author of the
"The Art and Mystery of Husbandry,"
and the "Art and Mystery of Gardening,"
as well as of the
"The Art and Mystery of the Vineyard,"
and the "Art and Mystery of the Orchard."
The second Edition, corrected and enlarged,
with the addition of several new Chapters,
and a new Preface.

By G. M.

LONDON
Printed by W. Griffin, for E. Taylor, and G. Galt,
at the Bible on Ludgate-Hill, near
St. Dunstons Church, 1753.



TO THE
HONOURABLE
Knight, Sir GEORGE RIVERS
of Chafford, in the Countie of
KENT.

SIR,



*Ad I no scale (more than this bare
and plain moulded Epistle,) by which
to come to your worthy eares, yet in
respect of the honest livery which it
carries, (being necessary and husbandly
Collections, especially gathered for the
Country and Soyl wherein you live) I
know it cannot chuse but find both fa-
vour & mercy in your acceptation; but
when I call into my consideration the*

*great worthiness of your experience in this and all other the like
affairs which tend to the generall benefit of the Common-wealth,
and weigh the Excellency of your Wisedome, Judgement, Bounty,
and Affection unto Hospitality (which give both strength and ad-
vancement to projects of this nature) I could not but take unto
myself a double incouragement, and boldly say unto this Work
which I offer unto your goodness, Goe and approach with all thy
sweetness before him, he that so perfectly knowes all which thou
canst or wouldest discover; he that is able both to correct and a-
mend*

The Epistle Dedicatory.

mend any thing that is imperfect in thee, he, for vertues sake, will never forsake thee. Beleeve me (worthy Sir) should this Subject wish it self a Patron, I doe not think it could wish beyond you; for you are a volume full of all that of which it intreateth: witness your yeares, your supportation of the poor, and your continuall employments; wish any of which there is not (of your rank) a second living in your Countrey, to walk hand in hand with you. Being then (dear Sir) the oldest and best friend to your Countrey, forsake neither, nor this which comes to serve it; and though in this Glass some lineaments may appear imperfect, yet by the help of your favour (though little be exact, or most excellent) nothing shall be gross or unworthie the survey of your worthier patience. And so I rest,

Yours to be commanded.

Gervase Markham.



A Discourse of the Weald of Kent; and a comparison of Arable Lands therein, with the other parts of the Shires. Together with some necessary counsels for the ordering and enriching of the marleable Lands in the Weald, as generally in any part of this Kingdome.



The Weald of Kent is the lower part of that Shire; Further Ad-
 lying on the South side thereof, and adjoyneth to dition.
 the Weald of *Sussex*, to the West.

This Weald, both in *Kent* and *Sussex*, was some-
 times all (or the most part) woody, Wild, and (in
 the first times) un-inhabited; and from thence took the
 name of Weald from the *Saxon* word, *Weale*, or *Yeale*, or
Weald, which signifieth a Woody Countrey, or Forrest-like
 ground. The *Brittans* called it *Andred*, which signifieth Great-
 ness or Wonderfull, and in Latine it was called *Saltus Andred*,
 (that is to say) the Chase or Forrest of *Andred*, by reason of the
 great circuit, or large bounds thereof.

Touching the true boundary or limits of this Weald, there
 have been diverse opinions, and most of them various, and much
 differing both in place & quantity, but that which is the neereft
 & best alied unto truth, both according to the opinions of *Affer-*
tus Aenevensis, *Henry of Huntingdon*, & others of most credible
 report, is that extendeth from the city of *Winchelsey* in *Sussex* an
 hundred and twenty miles in length towards the West; and
 thirty miles in breadth towards the North. Now although this
 report be most agreeing unto veritie, yet who knows not that
 curiosity may raise up many objections to withstand it; and
 therefore *M. Lambert* in his *Pereambulation of Kent*, hath pre-
 scribed the best and most infallible way to find out the true and
 certain

certain bounds of this Weald, to be only by Jewry, or the Verdict of twelve men impannelled for that purpose, either in case of controversie, or other particular search; and this hath been in these latter times brought forth most plentifully: for it hath been found by divers late Verdicts, upon speciall and most necessary occasions, that the Weald of Kent is truly M. Lamberts second step in his Perambulation of Kent, reaching from *Winchelsey* in *Suff*, and that hill there, unto the top of *Rivers* hill in Kent; and neither farther towards *London*, nor shorter towards *Tunbridge*; which agreeth so perfectly with the former limitations, that both may be received as most true and sufficient.

This Weald was for many yeares held to be a wild Desert, or most unfruitfull Wildernesse (as write the authors before mentioned) and indeed such is the nature and disposition of the soyl thereof to this very day: for it will grow to fern or wood, if it be not continually manured and laboured with the plough and kept under by tillage; so as it may truly be said of it, *Incultis parantur vomere Sylva*. It is throughout (except in very few places adjoyning to brooks or rivers) of a very barren nature, and unapt either for pasturage or tillage, untill that it be holpen by some maner of comfort, as dung, marl, fresh earth, fodder, ashes, or such other refreshings; and that seemeth to have been the cause for which in old time it was used as a wildernesse, and kept for the most part with herds of Deer, and droves of Hogs, as is specified in divers historicall relations.

And as there be yet remaining in *Sussex* divers great forrests and sundry commons or wafts, having five or six miles in length, which for the most part are not fit to be manured for corn, and yeeld but little profit in pasture; so have there been also in *Kent* (within our memory) a great number of woody and over-grown grounds, converted of late, even after such a manner as in the said Perambulation is testified: where it is said; That although the Weald of *Kent* belonged to sundry known owners long since, yet was it not then allotted into particular Tenancies, as the other parts of the shire were, but it was, in proesse of time, by little and little gained, as men were contented to inhabit there, and to rid it of the wood. And hereof it is also, that besides sundry whole parishes which

be named dens, or low places, as *Tenderden*, *Marden*, *Beneden*, and sundry others; there be moreover many smaller portions almost in every part of the Weald of Kent, which he likewise called dens; as the den of *Cranebrook* in *Cranebrook*, the den of *Hawkhurst* in *Hawkhurst*, and such others; the which (as it seemeth) were at the first undertaken to be manured by sundry particular persons, whose names were then taken for those very dens, and continued many yeares together, as by antient evidences it doth yet appear, howsoever the age of long time hath now almost worn & consumed them all out of knowledge. Neither doth the Weald of Kent contain so many great manors or courts (for the proportion of the largeness) as the rest of the Shire doth, but was appertaining, for a great part thereof, to sundry of those manors which doe ly at large dispersed thorow the Shire, whereof each one had a great portion in the Weald, which both in the book of *Dooms-day*, and in sundry the court Rolls, and Rentals, passeth by the name of Weald, and *Sylva Porcorum*, or swine gats, which were granted to divers of the farmers and owners of sundry tenancies which did belong unto those dens and other lands within the Weald.

And albeit these dens be for the most part good large portions of lands, that be now broken into many severall possessions, so as the same one Den sufficeth twenty householders at this day, yet it is very likely that each man at the first had his severall den wholly and unbroken, whereof he and his posterity beareth name, untill that the same was by the custome of *Gavel-kind*, by sale or by exchange divided and distributed amongst others into parts, as we do now see them. But howsoever this Weald be of it self unfruitfull (as I said) and of a barren nature, yet so it hath pleased the providence of the Almighty to temper the same, that by the benefit of *Marge* or *Marle* (as it is commonly called) it may be made not only equall in fertility with the other grounds of the shire, as well for *Corn* as *Grass*, but also superiour to the more and greater part of the same. The which manner of bettering the ground is not now newly discovered, but was the antient practice of our forefathers many yeares agoe, as by the innumerable *Marle-pits* digged and spent so many yeares past, that trees of 200, or 300

yeares

The use of
Marle is an-
cient.

Marling was
discontinued
and is now re-
vived.

years old, doe now grow upon them, it may most evidently appear; besides the which we have mention of Marle in books of gainage or husbandry, that were writtten in the daies of K. Edward the 2. or before, howbeit the same manner of tillage, by meanes of the civill warrs, maintained many yeares as well in the time of the Barons warrs, as of the warrs between the house of York, and the family of Lancaster, was so given over, and gone out of use, untill these thirty or forty years, that it may be said to have been then newly born and revived, rather than restored, because the very true art of inriching the ground by Marle, seemeth to lye hidden in part, as yet not to be discovered to the full: for in this short time we have seen many arable grounds, which for fundry yeares after the marling of them, have plentifully born Wheat and other grain, to be now become unfruitfull, and so will they continue, albeit they should be now marled again. And this commeth to pass by the ignorance of the right manner of ordering the Marle, which is as strong and cheerfull as ever it was before, howsoever it worketh not his naturall effect, through the unskilfulness of the Husbandman, that both wasteth the Marle, and loseth with all his time, his labour, his cost, and the profit of his ground. I cannot deny but a man shall see some grounds of nature fit to take Marle, and of situation so neer to Marl-pits long time opened, that they might be marled plentifully with little charge; and have been heretofore marled indeed, and yet the same to lye now unplowed, and not only barren of themselves, but also unapt for marle, and incapable of amendment by Tillage: but I must say withall, that albeit the men in those former ages had the right ordering of marle, yet were they not all good Husbandmen alike, neither doth the Field joy alike under the Farmer, and under the very owner of the same, the one seeking the very uttermost gain that may be made during his short interest, and the other endeavouring to perpetuate his commodity, even to the end of his estate, which hath no end at all: so that through unskilfulness of the one, and greediness in others, the ground may sooner be crammed to death with Marle, then it shall be made the better or fatter by it. The reason whereof I will reserve, untill that I have cause to teach in particular after what man-

ner and meature the ground is to be marled. In the mean while I will open the nature and conditions of this Wealdish ground, comparing it with the Soyl of the shire at large, and afterward declare unto you what the Marl is, and what sorts thereof there be usually found in the Weald of Kent, and lastly enter into the true and profitable use thereof, as well in each sort of arable Land, as also for the increase of Corn and Pasture through the Kingdome.

The arable ground of this Weald hath commonly a fleet and shallow mould to be turned up by the plough, so as in many places the dead earth or mould is within three inches of the face of the ground, and in the best places, the good Mould exceedeth not six inches in depth at the most; and therefore it wanteth convenient substance to nourish Corn any long time, but will faint and give over after a crop or two; for the which reason also, it cannot yeeld any sweet or deep gras. Besides this, the Weald hath many copped or hillish grounds, out of which there do many Quits or Springs of water issue, that make it cold and barren; and from these hillocks, the best part of the good Mould is washed down into the Water-courses and Dikes that be made to divide and drain the Land. Furthermore the Weald is divided into many small inclosures, the biggest sort (for the most part) of which, are between sixteen Acres and twelve in quantity, and thereby hath it many Hedges and Trees, which in unseasonable weather doe keep both the Sun and wind from the Corn, so as for want of that succour and comfort, it groweth, and many times rotteth in the earth, so that it carneth not, nor eareth, nor prospereth not kindly many times. And these small Closes are caused by this, that men are not able to Marl any great part or quantity of ground at once; and having marled a little, they are desirous to sow it with corn: for the preservation whereof, as also for draining it, they are inforced to make so many and small severalls: for all which reasons it is plain, that there is little good arable Land there, and rarely any good Pasture, those onely places excepted, which are amended by irrigations of floods, which there is called flowing and overflowing. Contrarywise, the arable land of the Shire at large hath a deep and fat Mould of good earth, that is

able to bear five or six good Crops together without intermission; and after 3. or 4. years rest, will do the like again, and may so interchangeably keep that course for ever: yea, there be many grounds that are sowed without ceasing, because the Mould is so deep, that when the upper part thereof beginneth to faint and be weary, men can adde some strength of Cattell, and with the Plough go deeper, and fetch up a fresh Mould that will continue for a long season. Furthermore this arable ground is a hollow dry ground, for the most part, on a deed Clay, that by tillage, and the weather, will become dry and spongy, so as the Rain there washeth in the fat of the earth, the rather because it is not so hillish and sliding as the Weald, but more leuell, even, and champian also, by which the Sunne and Wind do dry the corn, and doe make it carn or eare well, and yeeld a purer flower then that which is sobbed in wet, and hath long time lyen before it be dryed again. But for as much as the great odds between these two sorts of grounds, may be made even by the help of *Marl*, if it be rightly ordered, as I said, I will now shew you what it is, and how many sorts thereof be found in this Weald of our Country. *Marl* is indeed, as it is in name, the fat or (marrow) of the earth: for so did the *Germans* , and so did our elders the *Saxons* terme it, of the word *Marize* , which we sound *Marrow* , and thereof we call it *marling* , when we bestow that fat earth upon our lean ground. *Pliny* saith, that the *Britains* (meaning us) did use to amend their Land with a certain invention which they called *marga* , that is, the fat of the earth, and it is to be seen in *Conradus Heresbachus* , that the *Germans* doe use it to the same end, and doe call it by the same name till this very day: it is therefore a fat, oylie and unctious ground, lying in the belly of the earth, which is of a warm and moist temperature, and so most fertill, seeing that heat and moisture be the father and mother of generation and growth; howbeit this is not a pure and simple marrow (as that is which lieth in our bones) but a juyce, or fat liquor mingled with the earth; as is the fat which lyeth mixed, and dispersed in our flesh, so as the one may be drawn away, and the other remain, as it shall anon appear unto you.

Four sorts of
Marle.

Four sorts of *Marle* be found in this Weald, known asunder

der by the difference of colours, and thereby also differing in degrees of goodnesse one from the other: for there is a gray, a blew, a yellow, and red Marle, all which be profitable, if they be earthy and fat, or slippery as soape: and most times little worth, if they be mixed with sand, gravell, or stone. So the blew is reputed the best, the yellow the next, the gray the next, and the red lesse durable then the other three; and yet it is thought the red to be the better, if it be found upon the blew, or others. These Marles doe lye in veines or floores, amongst those hillocks or copped grounds most commonly whereof; I have spoken, and do oftentimes shew themselves at the foot of the hill, or about the mid-way, between the foot and the top thereof: some of them have over them a cover of ground, which we call Cope, not exceeding seven or eight foot in depth, some lie deeper, and other some do arise, as namely, where the round lyeth not high, and that Marle commonly is very good; and there is in diverse levell grounds good Marle.

1. 2.
3. 4.

Four sorts of
Grounds.

1.

2.

3. 4.

And as Marle is for the most part of these foure colours, so is arable ground for the most part of these foure sorts following; that is to say, either a cold, stiffe and wet clay, which is either the cope of the Marle, or lyeth neer unto it, and is therefore commonly called, *The Marle Cope ground*, or a Haisel Mould, which I count to be one of the best wealdish Moulds; being a compound Mould, and very good for Marle, and will quit the cost very well. Then there are two sorts of sandy Mould, the one being a reasonable good kind, but not equal to the haisel Mould, for you shall have in divers places of the weald this haisell mould to bear two or three good crops of Wheat, being Summer fallowed, together, which you shall hardly have of any sandy ground without mending: but as I said of the better sort of these two kinds of sandy Moulds, you have commonly very rich Wheat, being well Marled, which is not so barren as the other; but this last kind of sandy Mould is a very barren kind of ground, and hath a very fleet Mould, and you shall have very heath grow upon it in divers places; and yet being ordered, as followeth, with Marle, will bear both good Corn

and Pasture. And now that wee may the better understand how to Marl and Manure every of these sorts by it self, you must know, that the haifell ground being dry, and not subject to Winter-springs, or tears of water (for which, some call such, A whining or weeping ground) is to be handled thus.

The ordering
of the Hattel-
Mould.

First, Plough it as deep as you can, with the strength of eight beasts at the least; and be not afraid to Plough up some part of the dead earth that lyeth under the uper good Mould: for the Sun, the Rain, the Wind, and the Frost, will in time mellow and amend it; and besides that, the Mould will be the deeper for a long time after, and thereby keepe it selfe the longer from being stiffened with the Marle. Then you may bestow 500. Cart-loads (as we call them) of Marle upon each acre thereof, every load containing 10. or 12. bushels of eight gallons, and each acre containing 160. rods of 16. foot and a half to a rod. Then also you may chuse whether at the first breaking up you will sow it with Oates, to kill the Grasse, or else first Marle it, and sow it with Wheat, or otherwise Summer-fallow it in the *May* after the Oates, and then Marle it, and sow it with Wheat. Upon that fallow or gratten (as we call it) you shall doe well to sow it with Pease, and at *Michaelmas* following, to sow that Pease-stubble or gratten with Wheat again, which also will be the better, if the Summer wherein it carried Pease, were moyst; because the Pease being rich and thick, do destroy the Grasse, that together with the washing of the fallowes by raine, doth greatly consume the heart and vertue; or, as we call it, the state of the ground. But if that Summer were dry, then is a fallow best, because the Sunne with his heat doth much good to the ground, and inableth it the better to beare out the weather in the Wheat-season ensuing. If you like to sow it, as I said, with Pease, sow them as earely and timely as you may, for they will be so much the sooner harvested, and then also you may Plough or stirre your gratten the sooner, whereby it will be the better hardned to beare out the weather in the time of sowing of your Wheat: but I doubt, Pease doth somewhat stiffen it. Two bushels of wheat do suffice for the sowing of an acre hereof, except it be for the first crop, after the

the new breaking up of the ground; during which time, there is found a worme, called an *Emble*, which in *French* signifieth Corn in the ground, being of colour yellow, and of an inch in length, and will eat some part of the Corn; but if you sow it thick, it will be both small, eared, and thick, and slender of straw, which the rain and wind will beate and hurle downe, and then it will scarcely rise again; or if it doe, yet through the neernesse of the shadow of the trees and hedges, that in so small closes be many, it will rather rot for want of drying, then come to maturity, that is, to perfect hard, and full grown Corn. After your first marling, you must carefully fore-see, that you plough not the ground either with deep or broad Furrowes, but fleet and narrow, lest you cast your Marl into the dead Mold; for Marl differeth much from Dung in this behalfe; Dung spendeth it self upward, and howsoever deepe it lie, the vertue thereof will ascend: but Marle (as saith Sir *Walter Henly*, in his Husbandry) sendeth his vertue downward, and must therefore be kept aloft, and may not be buried in any wise. Furthermore, if your ground be hillish or coppied, it shall be fit that you make your Ridges 7. or 8. foot broad at the least; for in such falling lands, the more broad furrowes you make, as you must make many, where you make Ridges, the more of your Marle shall be washed and carried into the bottomes. It is good also to draw a crosse or quarter-Furrow, and opening the ends of your land-Furrowes stopped, into it, to leave the other endes of your Furrowes that the water-shoot runne not all the length of the field. Againe, this ground would alwayes be sowne under furrow, and that also before *Michaelmas*, if the season will so permit: for this ground (if it be well husbanded) will be mellow and hollow, or loose, whereby through Raine and Frost, it would sinke downe from the root of the Wheat, if it should be sown above Furrow, the which being uncovered, must needs be bitten and killed with the cold. It is also very fit that you harrow not this sort of ground too small, but that you leave the clods as big as a bowl, the which being mounded with the frost, will both cover and keep warme what is underneath.

neath. Moreover, it shall be good, that upon some fair and dry day, in the beginning of *March*, you put your flock of Sheep into your Wheat, that with their trampling upon it, the Corn may be well, and fast clodded with the earth, yea, and presently after (if it will bear foot) you may roll it as you doe Barley, whereby both the Clods shall be broken, and the Gratten or stubble shall be more even and ready for the Mower. Generally you must understand, that after you have bestowed your *Marle* in the field, you ought to let it lye unspread abroad, untill you be ready to plough, and then immediately after the spreading of it, turn it into the ground with the Plough; for otherwise, if it should lye long spread in the field, the Sun will spend no small part of the fatness thereof, although I know many desire it, because it will be the smaller being burned with the Sun; which I like not. And therefore also no good Husband will carry and spend his dung in the time of Summer, except he do presently withall plough it into the ground; for although the Mould of the arable Land it self will take good, if it be turned to the Sun, which will both dry and fasten it, yet the matter fareth far otherwise with the *Marle*, from which if the Sun shall draw and suck the fat moisture that maketh the Land fertile, then becommeth it (as *Columella* speaketh of the worst sort of ground) *Solum siccum, pariter & densum & macrum, quod sine exerceatur, sine cessat, colono refugiendum est.* It becommeth (saith he) a dry, thick, and lean Clod, which whether it be tilled or laid to rest, must be forsaken of the husbandman as unprofitable. And now your Hazell-mould being thus marled, plowed, sown, and manured, you may not charge with Wheat above twice, and then it must rest five or six yeares together; all which time it will bear a very good and sweet Pasture, well set with a white Clover, or three-leaved grass, most bating and profitable, both for Sheep and Bullocks.

After those yeares ended, it will grow to some Moss, or will peradventure cast up Broom; and then it is time to break it up, and sow and handle it as before for two other Wheat-seasons or crops, leaving it a wheat-gratten or stubble, rather than with an Oat gratten or stubble, which bur-

burneth the Land being marled. Being thus interchangeably sowed and rested, your Hazell mould will continue good arable and pasture, by the space of thirty yeares together, whereas if it should be continually sowed, six, or seven, or moe yeares together without rest, it will become utterly unfruitfull, both for Corn and Cattell also. Neither will it any thing avail to marle it over again when it is so decayed, because the former marle having his juice exhausted by continuall Tillage, whereof the Corn sucketh one part, and the Sunne, Wind and Weather dry and wasteth the rest, is but a dead Clod (as I said) that is not capable of new *Marle* to amend it, nor casteth any profitable grass at all. For proof hereof, I my self have seen, that the common earth of High-ways, by treading of Cattell, washing of Raine and the drying of the Sunne and weather, lay separated from the naturall juice which it had in the pit, and spreading it upon the ground, I saw that the land was not only not amended, but much the worse by it. And now for an end of handling this sort of Hazell ground; if it shall appear unto you that five hundred loads of *Marle* upon the Acre, have clanged, stiffened, and too fast bound your land (as indeed the nature of *Marl* is to bind and to stiffen) then take you some of these waies to help it: either rest it four or five years, or fodder upon it before you bring it up with so many Cattell as you may; or take the uppermost part of your Ditches or Fore-lands, or wast places of your fields which you may mingle with Dung, and which, before you sow your Wheat, you may lay upon your fallow, and stir it in with your plough, and by this you shall both loosen your *Marle*, and refresh your ground: so that within forty yeares the mould of your ground will clean eat up and swallow the *Marle* that you lay upon it; and then become hungry, and is capable of *Marle* againe as it was before at the first.

And by this also you may see the very cause for which it is good not to sow your marled land continually, but to pasture it by turns, and so give it rest; namely because the continuall plowing doth exhaust and spend the fat of the *Marl*, leaving the drossie, dry, and fruitless parts thereof, to lye and cover the face of your ground: whereas pasturage, through the dunging,

trea-

treading, and foddering of Cattell, doth increase a new Mould, which mingling it self with the dead Mould, doth in the end give some life and heart unto it. And therefore these Farmers and Owners that have been at the cost to marle their ground, and will not forbear to till it, but hastening to raise their charge, do thereby utterly strike it with barrenness, are like to *Ajops* man, who having a Hen that layed him every day a golden Egge, and being greedy to have all the gold at once, did therefore kill the Hen, thinking to have found her belly full of gold, and so was both defrauded of that he looked for, and lost also what he had before. Hitherto of the nature, ordering and marling of this hazell ground. Generally now for the continual fallowing and stirring thereof, you must understand, it may neither be fallowed wet, lest it answer more Grasse than Corn; nor yet so dry, that the dead bottom swel up, as in great drowth it will, and swallow the good Mould that lieth above: and therefore bind not your self to any precise time of any month, but the opportunity either in *May* or *June*, as you shall find the weather to have prepared it for your desire. In the like temper you ought to stir it after a showr, after *Saint Iames* his day, or in the end of *Iuly*, for so will it be dry and hard before the time of sowing: whereas if it be stirred later, every small Rain will distemper it into Dirt or Mire, by reason of the tenderness thereof, and then can you not fitly bestow your seed upon it.

The ordering
of the Marl
Cope ground.

The Marl Cope ground followeth, which is most commonly (as I said) a stiffe, wet, cold Clay, and not so fit as the former to be marled for Corne, except in some few flete places thereof, but yet it may serve for Pasture or for Oates; such of them as be marled, must be fallowed flete or shallow, lest the Marle become drowned in the wet: then being marled, they may in dry summers (and not over-moist Countries) beare Wheate in some mediocritie. Three hundred loads at the most of Marle are sufficient for an acre of this kind, and two bushells and a halfe of Wheat will sow the same, which must be cast above furrow fourteen or twenty daies before *Michaelmas*. It requireth round, high and narrow Ridges, and that the

the water-furrowes be stricken somewhat deep, the better to convey moisture from the Corne, and that it be left cloddy as much as may be: and yet to say the truth, such as will convert this sort of ground to Tillage, must provide a greater quantity of rich ground or Greet (as we terme it) and Dung, than of Marle it self, to amend this Land withall. But if there be any ground that is light and whining, or weeping, because of Springs that are therein, and therewith doth cast up Rushes, let that be marled upon the greene land with foure hundred or five hundred loads upon the acre, about the latter end of Summer; for so will the Marle sinke into it, and cast up a sweet grasse for eight or ten years together, and untill that the Marle be sunke so low, that another sward or crust of earth be grown over it, and then it is fit time to plow it, but yet very flecte and narrow, for so will it bear good Oats; but if it be so wet that you cannot adventure to sow your Wheat upon it, because the Rushes be not killed with this first plowing, then may you sow it againe with Oates, drawing good water-furrowes to draine it, because it will be the wetter for plowing, and thereby the Marle also will the sooner lose his force; thus doing, let it lie to pasture again.

There be some other grounds of the Marle-Cope, which carry a sowe Grasse, and the Dyers-Weed, (commonly called Greening-weed) and having a great tore thereof, the which also may be amended by three hundred or four hundred load of Marle upon the acre of the green land: for the Marle will both rot the tore or vesture thereof, and also enrich the Mould very much; so as it will answer good Pasture twelve years after: and when you shall perceve that the Marle is well sunk, then may it be Ploughed flecte and narrow, sowed with Oats, and fallowed; so may it both bear good Wheat, if it find a good season, and be the richer a long time after, partly by the benefis of the Marle, partly by the rotting of the tore and sward, and partly by the dung and water of the Cattell that pasture upon it: for the sweeter the Pasture is, the more Beasts it feedeth, and the more beafts it beareth, the more it self is amended by it.

C

Touch-

Touching the fallowing of this ground great heed is required: for as it swelleth more then the Hasell-ground, if be taken hard and dry, so it is more grassie then that, or the Sandy Soyl if you fallow it wet: The season therefore followeth commonly in *April*, or in the beginning of *May*, for to fallow it, and to stirr it about *Midsummer*, or so soon after as the rain shall have prepared it meet for your unshod Oxen to labour upon it, Many men fearing to hit the right season for this ground in the Spring of the year, do make it ready by a Winter fallow before *Christmas*, and by stirring it before *Midsummer*, if they may, which manner is not to be misliked.

The ordering
of the Sandy-
moulds.

Lastly, commeth the two sorts of Sandy-ground, and gravelly-mould; the one being to be ordered much after the hazell mould, saving he would have somewhat more marle, and also would be favoured more in the often tillage, than it: for the hazell mould wil bear or endure more than the Sand. But this last sort of sandy-ground, being a very staring Sand (as we use to call it) for much of it wil bear Heath, being of it self very barren, and very flect or shallow Mould, and over hot and dry, and by reason of that extremity, is unfertill except it be marled very plentifully. And therefore when you break up this ground, Plough it as deep as you may, not fearing to cast down the best Mould thereof, because the *Marle* will pierce thorow, and sink down into it. An acre of this ground requireth five hundred or six hundred loads of your *Marle* at the least. Sow alwaies under furrow about *Michaelmas* with two bushels and a half upon the acre, which it will better carry than the Hazell ground: for although the straw be small, yet will it be harder, and stand better than that of the other. The worme whereof I speak, will be busie with that, that groweth on this sort of ground, utill that the heat thereof be somewhat aswaged by the Marl. If your ground be hilly, make your Water-furrowes in such sort, as I have said before, for the saving both of your *Marle* and Mould, harrow it very little, leave it as cloddy as you may. After that you have taken a Crop from it, fallow that Wheat Gratten or Stubble in *May*; after that stirr it also, and then about *Michaelmas* sow it with Wheat again: for
it:

it is not yet rich enough to bear you good Peale. This done, let it rest four or five yeares, and if it send up any plenty of broom, cut or pul them when they be of some mean bigness, but plough not the ground untill it have taken such rest; and after it, you may well break it up of new, and sow it with Oats: which Oat-gratten or Stubble, you must Summer-fallow, when it is at the Harvest: and then if you desire to have it in good heart, you must Marle it with three hundred or four hundred loads upon the Acre again. After this Crop thus taken, rest it five or six years, and then take one Crop more of Oats from it, and after a Summer-fallow, sow it with Wheat, and suffer it to lye a Wheat Gratten or Stubble, till it shall have rested as before is appointed for the hazell ground, and so it will be the better thirty or forty yeares after the marling. Wee have in this Weald a sandy and gravelly ground that is wet and weeping, the which is scarcely worth the Marling, except the nearness of the *Marl*, and thereby the small cost and charge thereof may intice a man to bestow the cost upon it with *Marle*, and then the best way is to Marl upon the green Land, or is upon a fallow, with 500. loads or more upon the Acre, or rather to take the profit thereof by Pasture then by Tillage: for it will hardly beare good Corn, which is soon killed with wet vapour that is continually sent up from the wet springs that lye under it. This sort of wet ground is to be fallowed, when it is both hard and dry, because it swelleth not as doth the Hasell Mould, and may therefore be taken in *June*, if former fair weather bring it not to a dry season; and it is to be stirred also after a shower, in the like plight as the hazell-Mould before. Your marleable grounds being ordered in this wise, severally set down for each kind of them, will continually stand fruitfull either for corn or pasture, and albeit the high prices which Corn hath of late yeares carried, may allure some men to sow corn incessantly, and thereby to spend their *Marle*, and to choke their arable in the end, yet I doubt not but the wiser sort can see that it is much better to maintain their grounds hearty and in good plight for ever, then to raise a short gain, that will bring a long and perpetuall loss upon them; the rather also, because that butter,

Cheefe, and the flesh of beef and mutton be advanced in price equally, if not beyond Wheat, Rye, barley, and the other grains. Howbeit a good Husbandman will make his profit of them both: for if he have one hundred, or one hundred and twenty acres of this Wealdish arable, he will so Marle and manure them, that dividing his land into five or six equall parts, he may continually plough twenty, or five and twenty acres for corn, and yet lay to Pasture the rest by turnes, so that by the help of his *Marle* his land shall be continually rich and profitable, both in the one and other of them. And thus I have spoken of the Weald, describing the nature and property thereof: so may every man of discretion and judgement, which shall meet with earth of the same quality and condition (in what part of this Kingdome soever) make application of these Rules before rehearsed, and no doubt but the profit will make both the labour and cost profitable and pleasant.

THE



The severall waies, according to the opinions of Writers, and the certaine waies, according to the experience of Husbandmen, for the destruction of Moles, or Moales which digge and root up the earth, and how to reduce and bring the ground to the first goodnesse, having been spoyled by them.

IT is needles either to describe the nature and quality of this Vermin, or the injury and hurt which they do to the Husbandman, Gardiner, and Planter, since no Country is exempt from their annoyances; but touching the remedies, they are of greater secrecie, and therefore I thought good in this place to insert them.

The antient writers are of divers opinions touching the manner of destroying this creature, and therefore have left unto us sundry Medicines how to work the same: amongst the which, one writeth, as an approved experiment, that if you take Walnut shels, and fill them with brimstone, chaff, and Petrosin, and then setting them on fire, put them into holes or trenches, through which the Moal passeth, the very smel or stink therof will poyson them; so that if you dig, you shall find them dead in their holes.

Another affirmeth, that if you take brimstone, and dank stinking litter of horses, and burn it in the holes or haunts of the Moales, it also will impoyson them, so as you shall find they will come out of their Caves, and lye dead upon the green gras.

A third affirms, That if you take green Leeks, Garlick, or Onions, and chopping them grossely, thrust it into the holes, the very fume or savour thereof will so astonish and amaze the Moales, that they will presently forsake the earth, and falling into a trance, you may take them up with your hands. Now there is not any of these medicines which can

be dis-allowed; for there is no doubt but that they will work the effects spoken of, if the Moale can be brought to take a full sent thereof: but it is a Verminè curious of sent, and passing quick of hearing, and being in a spacious ground, will prevent these baits: and therefore they are rather to be applied for garden or little grounds, where there is but a Moal or two, than in large fields, where there be many hundreds.

To conclude for this matter of medicines, or for the helping of gardens, hop-yards, or any small spot of ground, there is not anything held more available, than to sow in that place the hearb called *Palma Christi*; for it is found by certaine experience, that wheresoever that herb groweth naturally of it self, or otherwise, is either purposely sown or planted, there in no wise will any Moal abide.

Thus much I thought good to shew you for the use of medicine, and for clearing of small grounds; now for the annoyances which happen to great, large, and spacious fields, through the multitude of Moals, there is only three absolute wayes for the curing of the same.

The first is, in the moneths of *March* and *Aprill*, to view where they cast, and go about to make an extraordinary great hill, in which they build them nests, which is known by the newness of the Mould; then look for the new trench which leadeth to the same; for as she goeth she returneth: then with your Moal-spade open the trench in divers places, and then very still & silently, and observing to take the wind, to prevent both hearing and smelling, watch the Moal as she goeth or returneth, which is, Morning, Noon, and Evening, and as soon as you see her cast, strike her with your Moale-speare, made of many sharp pikes, and so cast her up, and kill her. Thus have I seen by one man an hundred destroyed in one day.

The next infallible way for the destruction of Moales is, If you can by any possible means bring in water to over-flow and wash your ground, and as soon as the earth is wet over, the Moales will come forth of themselves, and you may gather

ther them up with your hands at pleasure.

The last (indeed as much approved as any) is to take a live Moal in the month of *March*, which is their bucking or ingendring time, and put it into a deep brass Bason, or other deep smooth Vessell, out of which the Moal cannot creep, and then at evening bury it in the earth up to the brimme, and so leave it, and the imprisoned Moal will presently begin to shrike, complain, or call so that all the Moales in the ground will come to it, and tumbling into the Vessell, they are prisoners also, and the more prisoners, the greater will be the noise: and the more noise, the more Moales will come to the rescue; so that I have seen 50. or 60. taken in one night, and in one night, and in one Vessell, or brass Kettle.

Now having thus learned how to destroy the Moales, it is meet you also know how to prevent the comming in of forraign Moales; because though you keep your ground never so clean, yet if your next neighbour be an ill husband, his field may soon impoyson yours again: herefore to prevent the comming in of any forreigne Moal, make but little Furrows or Trenches about your ground, and scatter in them small round balls made of Hempseed, or Hemp-seed and *Palme Christi*; beaten together, and you shall not need to fear the comming in of any neighbour Moals, how many soever there be about you.

Lastly, for the reducing or bringing the ground to the first perfection again (for howsoever some Husbandmen say, Moe Moal-hills, moe ground; yet 'tis certain, that moe Moale-hills, less good ground) for never was yet sweet grasse seen on a Moale-hill; therefore to bring it to perfection, which I mean to be meadow ground, or ground to be mowne, which Moale-hills cannot be: you shall first with a sharp paring-shovell, pare off the swarth about three fingers deep, for fear of hurting the roots of the grasse: and then the swarth taken off, digge away the rest of the Mould, and scatter it as small as you can round about the hill, then take the green swarth, and cutting it artificially, lay it close and fast, and levell, where you took away the Mould, as if there had never been Hill there: and thus do to all your hills, though they be never
so.

so innumerable: and after all your ground is levelled, as soon as the first shoure falleth, run all your ground over with a pair of back Harrowes, or an Harrow made of a Thorn bush, and it will break the mould as small as ashes, which will so comfort and refresh the root of the grafs, that it will grow in infinite abundance; and sowreness which was caused by reason of the Hills, will come again to a perfect sweetness, and the meadow will be more fruitfull then before by many degrees. And thus much for the destruction of Moales, and the reducing of the earth to his first goodnes.

FINIS:

Markbams farewell to

HUSBANDRY:

OR,

THE ENRICHING OF ALL
Sorts of Barren and Sterile Grounds in our
Nation, to be as fruitfull in all manner of
Graine, Pulse and Grasse, as the best grounds
whatsoever.

Together with the annoyances, and preservation of
all Graine and Seed, from one yeare to many yeares.

As also, a husbandly computation of Men and Cattels dayly
Labours, their expences, Charges, and utmost Profits.

Now newly the fifth time, revised, corrected, and amended,
together with many new Additions, and cheap experiments :

For the bettering of Arable, Pasture, and Woody Grounds :
Of making good all Grounds againe, spoyled with ever-flowing of
salt water by Sea-breaches ; as also, the enriching of the
Hop-garden, and many other things never pub-
lished before.

By G. M.

LONDON,

Printed by *W. Wilson*, for *E. Brewster*, and *George*
Sawbridge, at the Bible on Ludgate-Hill, neere
Fleet-bridge. 1653.

Know all men by thos presents
that I mar^t Arblans
Esquire

THE ENRICHING OF ALL

of Barons and Knights (ground in our
Medals to be as followeth in all England
Gaine, Polles and Gains in the best grounds
whichever

together with the improvement and betterment of
all Gaine and seed from one year to many years

As also husbandly computation of Men and Oxen's daily
labours their expenses, Gains and small profits

How many the full time, tithes, courses and expenses
of many new additions and cheap experiments

For the bettering of Arable, Pasture and Wood Grounds
the best way of husbandry, and the best way of
the best way of husbandry, and the best way of
the best way of husbandry, and the best way of
the best way of husbandry, and the best way of

By G. M.

LONDON

Printed by W. Stiles, for E. Knapton, and George
at the Bishop's Church, in the
New-bridge, 1673



TO THE RIGHT
WORSHIPFULL

and his most worthy friend

Mr Bonham Norton Esq;

Worthy Sir.

Knowledge, which is the divine mother of certain Goodness, never came unwelcome to a knowing Judgement; no more I hope shall this my labour to your worthy Selfe, since doubtless you shall find in it many things New, some things necessary; and nothing which hath not in it some particular touch of profit: It is a work your former encouragements to my other labours did create in me, and the wants you worthily found, I hope shall bring you supplies both wholesome and becoming. The experience, I assure your goodness, was the expence of a bitter and tedious Winter; but the content.

ment (in gaining my wish) made it more pleasant than all the three other Seasons. What ever it be, it comes to you full of love, full of service. And since I know vertue measureth all things by its own goodness; it is enough to me, that I know you are that Vertue. In you is power to judge, in you is Authority to exercise Mercy; let them both fly from your Goodness with that mildness, that in them my hopes may be crowned, and my self rest ever at your service.

GERVACE MARKHAM.

The



The preface to the Reader.

Shewing the use, profit, and truth of the Work.

THe use and application of this work (gentle Reader) is to reduce the hard, Barren and Sterile grounds, such as were never fruitfull, or such as have been fruitfull and are made barren by ill husbandry, to be generally as fruitfull as any ground whatsoever: from whence shall ensue these generall profits.

First, plenty of Corn and Pulse; because all grounds being made able and apt for tillage, the Kingdome may afford to sow for one bushell: that is now, hereafter five hundred, so mighty great are the unfruitfull wasts of Heathes, Downes, Moors, and such like, which at this day lye unprofitably; and to this abundance of Corn will arise an equall abundance of Grass and Pasture: for as the best ground of the worst is to be converted to pasture, and the worst to Tillage, so that worst being tilled and drest, when it hath done bearing of Corn, (which will be in six or seaven yeares) shall for as many yeares more bear as good pasture either for breeding or feeding as can be required, and then being newly drest again, shall newly flourish in its first profit.

Secondly, whereas in fruitfull places the third or fourth part of all arable ground is lost in the fallow or tith ground, now in these barren grounds you shall keep no fallow field at all, but all shall bear either Corn or Grass, that fallow part

To the Reader.

erving to pay for the charge bestowed on it and the rest.

Lastly, whereas in fertile grounds you cannot have either Wheat, Barley, or Rye, under two, three, four, five, and sometimes six severall plowings, as following in January and February, Stirring in April and May, Soiling in July and August, Winter-ridging in October and November, and Sowing, with other Ardors; now in these hard grounds restored you shall not plow above twice at the most to the saving of the Husband-mans pains, his Cattels travell, and a larger limitation of time for other necessary businesses.

For the truth of the work he that will ride into the barren parts of Devonshire or Cornwall, into the mountainous parts of Wales, into the hard parts of Middlesexe or Derbyshire, or into the cold parts of Northumberland, Cumberland, Westmerland, Lancashire, or Cheshire, shall find where industry is used, a full satisfaction for all that is here written.

Farewell.

Thine, G. M.



MARKHAM HIS Farewell to Husbandry.

CHAP. I.

*The Nature of Grounds in general; But particularly of the
barren and sterill earth.*



TO come to the full effect of my purpose without any preambulation, or satisfaction to the curious, (for to the honestly vertuous are all mine endeavours directed) you shall understand that it is meet that every Husbandman be skillfull in the true knowledge of the natures of grounds; as which is fruitfull, which not: of which, in my first Books I have written sufficiently; nor doe I in this book intend to write any title that is in them contained; for as I love not *Tautologie*, so I deadly hate to wrong my friend.

Grounds then, as I have formerly written in my first books, being simple or compounded; as simple Clayes, Sands, or Gravels together, may be all good, and all fit to bring forth increase, or all evill and barren, and unfit for profit: for every Earth, whether it be simple or compounded, whether of it selfe or of double mixture, doth participate wholly with the *Slyme* wherein it lyeth; and as that is more hot, or more cold, more moyst or more dry, so is the earth evermore or less fruitfull. Yet for the better understanding of the plaine
Coun

Countrey man, you shall know that both the fruitfull and unfruitfull Ground have their severall faces and characters whereby they be as well known as by the clime or situation of the continent; for that ground which though it bear not any extraordinary abundance of grasse, yet will load it self with strong and lusty weeds, as Hemlocks, Docks, Mallowes, Nettles, Ketlocks, and such like, is undoubtedly a most rich and fruitfull ground for any grain whatsoever. Also, that ground which beareth Reede, Rushes, Clover, Daisie and such like is ever fruitfull in grasse and Herbage, so that small cost, and lesse labour in such grounds will ever make good the profit of the Husbandman: But with these rich grounds at this time I have nothing to doe.

To come down then to the barren and unwholesome Grounds, you shall understand that they are to be known three severall wayes: first, by the Clyme and Continent wherein they lye; next, by their constitution and condition; and lastly, by outward faces and characters. By the Clyme and Continent, as when the ground lyes farre remote from the Sunne, or when it lyes mountainous and high, stony and rocky; or so near unto the skirts and borders of the Sea, that the continuall Fogges, Stormes, Mysts and ill Vapours arising from thence, doe poyson and starve the earth: all which are most apparent signes of barrenness. By the Constitution and Condition, as when the ground is either too extreemely cold and moyst, or else too violently hot and dry; either of which produceth much hardness to bring forth, and sheweth the earth so lying to be good for little or no profit. By the outward faces and Character, as when you see (instead of Grasse, which would be green, flowry, and thick growing) a pale thin mossie substance cover the earth, as most commonly is upon all high Plaines, Heathes, Downes, and such like: or when you see the ground covered with Heath, Ling, Broom, Braken, Gorse, or such like, they be most apparent signes of infinite great barrenness, as may be seen in many Mores, Forrests, and other wild and woody places. And of these unferuill places, you shall understand that it is the clay ground, which for the most part brings forth the Moss, the Broome, the Gorse, and such like: the Sand, which bringeth forth Brakes, Ling, Heath; and

and the mixt earth, which utters Whinnes, briars, and a world of such like unnatural and bastardly Issues.

Thus having a true knowledge of the Nature and Condition of your ground, you shall then proceed to the ordering, earing, and dressing of the same, whereby it may not onely be purged and clesed from those faults which hindred the increase thereof, but also so much bettered and refined, that the best ground may not boast of more ample increase, nor your more fruitfull placed neighbours exceed you in any thing, more then in a little ease.

CHAP. 2.

Of the Ordering, Tilling, and Dressing of all sorts of plain barren clayes, whether they be simple or compound.

THou whom it hath pleased God to place upon a barren and hard soyl, whose bread must ever more be ground with sweat and labour, that mayst nobly and victoriously boast the conquest of the Earth, having conquered Nature by altering Nature, and yet made nature better then she was before: thou I say that takest this honest delight in goodness, hearken unto these following Precepts.

As soon as thou hast well pondered and considered the nature of thy ground, and dost find that it is altogether barren and unfruitfull, the clyme and condition not suffering it to bring forth any thing of worth or profit, and that thou hast well weighed what manner of Earth it is, as that namely it is either a simple Clay, or a Clay so mixt with other earths, that yet notwithstanding the Clay is stil most predominant, thou shalt then select or chuse out of this earth so much as to thy self shall seem convenient, it being answerable to the strength of thy Teame, and the ability of thy purse and labour to compass; and this earth so chosen out thou shalt about the beginning of *May*, in a fair season, break up with a strong Plough, such as is generally used in all strong Clay grounds, the Share being rather long then broad, and the coulter rather somewhat bending then streight and even, according as the nature of the ground shall require,

The first enriching of barren Grounds

E.

which

which every simple Plough-man will soon find out in turning up two or three furrowes, for according to the cutting of the earth so must the Husbandman fashion the temper of his plough.

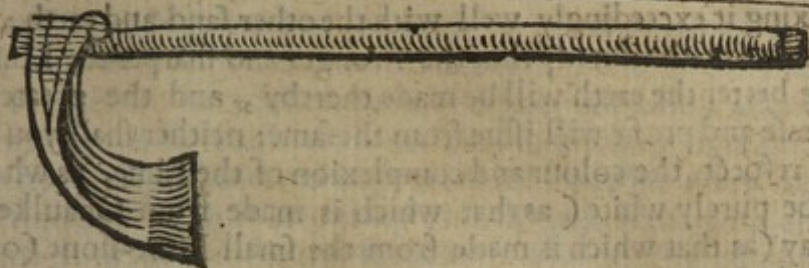
The manner of
plowing.

Now for the manner of plowing this bad and barren earth, if the ground lye free from water (which commonly all evil barren earths do) you shall then throw down your Furrows flat, and betwixt every Furrow you shall leave a baulke of earth half as broad as the Furrow, and so go over, and plow your whole earth up, without making any difference or distinction of lands: but if you fear any annoyance of water, then you shall lay your Furrowes more high, near, and close together, dividing the grounds into severall lands, and proportioning every land to lye the highest in the midst, so that the water may have a descent or passage on either side.

Hacking of
Ground.

Now so soon as you have thus plowed up your land, and turned all the swarth inward unto the earth, you shall then take Hacks of iron, well steeled and reasonable sharp, such a competent number, as your purse or power can compass, or the greatness of your ground requireth: for you shall understand that one good hacker, being a lusty labourer, will at good ease hack or cut more than halfe an Acre of ground in a day; and with these hacks you shall hew and cut to peeces all the earth formerly plowed up furrow by furrow, and not the furrowes onely, but also each severall baulke that was left between, and any other green swarth whatsoever the plough had escaped; and it shall be cut into as small peeces as conveniently as you can; for thereby is your mould made much more mellow and plentifull, and your Seed at such time as it is to be cast into the earth, a great deale the better and safer covered, and much more sooner made to sprout and bring forth encrease. Now for the shape and fashion of these Hacks, you shall behold it in this Figure.

When



When you have thus hacked all your ground, and broke in peeces all hard crusts and roughness of the swarth, you shall then immediately, with all the convenient speed you can (because time is very precious in these labors) (if you be neer unto any part of the Seacoast, or to any other creek or river, where the salt-water hath a continual recourse, thence fetch (either on horse-back, or in Cart, or other Tumbrill, such as the nature of the Country, or your own ease can afford) great store of the salt sand, and with it cover your ground which hath been formerly plowed and hackt, allowing unto every acre of ground, three-score or fourscore full bushels of sand, which is a very good & competent proportion; and this sand thus laid, shall be very well spread and mixed among the other hackt and broken earth. And herein is to be noted, that not any other sand but the salt is good or available for this purpose, because it is the brine and saltness of the same which breedeth this fertility and fruitfulness in the earth, choking the growth of all weeds and bad things which would sprout from the earth, and giving strength, vigour, and comfort to all kind of grain or pulse or any fruit of better nature.

Sanding of
ground.

When you have thus sanded your earth, you shall then if you have any Limestone about your grounds (as barren earths are seldom without) or if you have any quarries of stone (which are seldom unaccompanied with Lime-stone) gather such Lime-stone together, and make a kiln in the most convenient place you have, as well for the carriage of the Lime, as for the gathering together of the stone, and having burnt your Lime, the manner whereof is so generally well known through the whole Kingdom, that in this place it needeth little or no repetition, you shall then on every Acre so formerly plowed, hackt, and sanded, bestow at least forty or else fifty bushels of lime, spreading and

Liming of
ground.

mixing it exceedingly well with the other sand and earth; and herein is to be noted, that the stronger and sharper the Lime is, the better the earth will be made thereby, and the greater increase and profit will issue from the same: neither shall you need to respect the colour and complexion of the Lime, as whether it be purely white (as that which is made from Chaulke) or gray (as that which is made from the small Lime-stone (or else blackish brown (as that which is made from the great stone and main Quarry) since it is the strength and goodness of the Lime, not the beauty and colour, which brings forth the profits.

Manuring of
ground.

Now that this Lime is of excellent use, & wonderfull profit, do but behold almost all the Countries of the Kingdome where there is any barrenesse, and you shall find and see how frequently Lime is used, in so much that of mine own knowledge in some Countries where (in times past) there was one Bushell made or used, there is now many loads, and all risen from the profitable experience which men have found in the same.

Now, when you have thus limed your ground, you shall then take of the best manure you have, as Oxe, Cow, or horledung, Straw rotted, either by the littering of beasts, or by casting upon High-waies the mud of Lakes, Ponds or Ditches; the soyl of young Cattell made in the Winter time by feeding at stand Heakes, or any such like kind of O. dure; and this manure or compost you shall carry forth either on Horse-back, or in Carts or Tumbrels (according as the Country will afford) and you shall lay it and spread it upon your ground so formerly plowed, hackt, sanded and limed in very plentiful manner, so far forth as your provision will extend: for it is to be understood, that barren and hard earths can never be over-laded with good manure or compost, since it is only the want of warmth and fatness, which manure breedeth, and causeth all manner of fruitfulness.

Times for all
labours.

After you have thus manured all your ground, it is to be supposed that the season of the year will be shot on, for the labour of sanding will take little less than two months, your ground being of any indifferent great quantity, except you have assistance and help of many of your friends, which is a courtesie that

that every Husbandman may embrace, but not trust unto; for I would not wish any man that hath not Tenants to command, to presume on other friends, lest they fail him, and so his work lye half done, and half undone, which is a great Character of negligence and improvidence: but let every one proportion their labours according to their own strengths, and the number of their ordinary families. The liming of your ground will take at least half so much time as the sowing, and the manuring rather more than less than the liming; so that by any reasonable computation of time, beginning to plow your ground at the beginning of *May*, ere it be hackt, sanded, limed, and manured, *Michaelmas* will be come, which is the end of *September*; for I allow the month of *May* to plowing and hacking; *June* and *July* for sowing; *August* for liming; and *September* for manuring. So then to proceed on with our labour, at *Michaelmas*, or from that time to the end of *October*, you shall begin to plow over that ground againe which formerly you had plowed, hackt, sanded, limed and manured; and at this latter plowing you shall plow the ground somewhat deeper then you did before; and taking a good sitch (as they call it in husbandry) you shall be sure to raise up the quick earth, which had not been stirred up with the plough before, making your furrows greater and deeper than formerly they were, and laying them closer and rounder together than they were before; and in this arder or latter earing, you shall be carefull to plow your ground as clean as you can without baulks or other escapes in Husbandry, and as you thus plow your ground, you shall have certain Hackers, with their Hacks, to follow the Plow, and to cut the earth and furrows into very small peeces, as was formerly shewed in the hacking and cutting of the first arder; then so soon as your ground is thus plowed and hackt, you shall take a pair or two of very strong and good iron harrowes, and with them you shall go over your ground, tearing that which was formerly plowed and hackt into more smal peeces than before, and raising up the mould in much greater abundance than was formerly seen: which work once finished, you shall then take your Seed which would be the finest, cleanest, and best Wheat you can provide, and after the manner of good Husbandry

Of sowing the bandry, you shall sow it on the ground very plentifully, not starving the ground for want of Seed (which were a tyrannous penury) nor yet choaking it with too much (which is as lavish a foolery) but giving it the full due, leave it to the earth and Gods blessing.

The second harrowing.

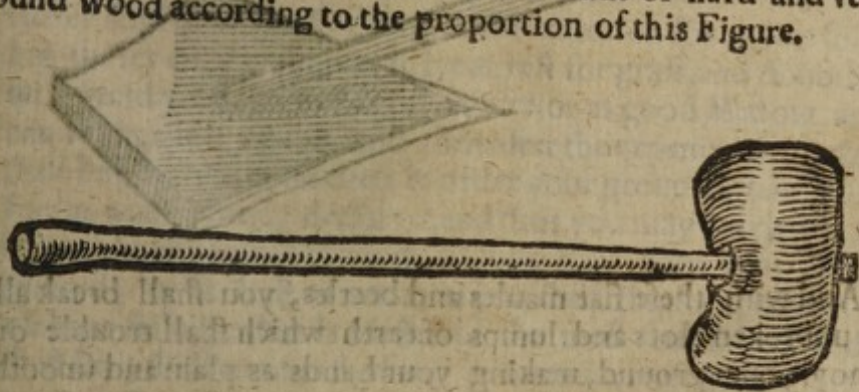
Faults in the earth.

Now so soon as you have thus sowed your seed, forthwith you shall take all the Harrowes again, harrowing the Seed into the earth, and covering it close and well with all care and diligence; and in this latter harrowing, you shall have great respect to break every clot as much as you can, and so stirre up and make as much mould as you can, and the finer such mould is made, the better it is, so it cover deep and close; for you shall understand, that all these kinds of barren Clayes are naturally tough, cold, and binding, whereby they stifle and choak any thing that growes within them; for the naturall toughness of the earth will not give any thing leave to sprout, or if it do sprout, the binding nature thereof so fetters and locks it within the mould, that it cannot issue out; or if it do (with extreme struggling) rise through the pores of the same, yet doth the cold presently starve the root and make the stemme utterly unable to bring forth fruit, or any profit at all; so that if the toughness be not converted to a gentle looseness, and easie dividing of it selfe, the coldness unto warmth, and the hard binding unto a soft liberty, there can be small hope of commodity, which this manner of dressing the earth bringeth to pass; for the mixture of the sand takes away the toughness, the Lime brings heat, and the manure comfort and liberty: as for the hacking and cutting the earth, that is to make all the rest symbolize and mixe together: for as if any Dispensatory make a Medicine, and cast his Ingredients confusedly one upon another, without care of mixture, melting or dissolution, shall find but a corrupt, disorderly, and ill compounded receipt; so he that dresseth and manureth his ground, and doth not by hacking, plowing, or some other husbandly course, mixe the earth and the compass perfectly wel together, shall seldom find profit from his Seed, or find any man of wit desirous to become his imitator. Now I must confesse, that some easie grounds of light and temperate nature, will mixe very well and sufficiently by the help of the Plough
only

only, but this barren hard earth of which I now write, must only be broken by this violent and extreme labour, or else there will neither be mould, earth, or any coverture for the Seed, but only foul, great and disorderly clots and lumps, through which the grain can never pass, and that which lyeth uncovered will be made a prey to fowl and other vermine which will hourly destroy it.

After you have sown and harrowed the ground, you shall then see if there remain any clots or hard lumps of earth unbroken, which the teeth of the Harrows are not able to tear in peeces (as it is very likely you shall perceive many) for these hard barren earths which are plowed up in their green swarths, are nothing neer so easily broken and brought to mould, as are the mellow soft earths which have been formerly plowed many times before, because the hard and intricate roots of the Grass, Moss, and other quick substances growing upon the same doth bind and hold the mould so close and fast together, besides the naturall strength and hardness of the earth, that without much industry and painfull labour, it is impossible to bring it to that fineness of mould which Art and good husbandry requireth; therefore as soon as you behold those clots and lumps to lye undissevered and unbroken, you shall forthwith take good frong clotting beetles; or maules made of hard and very sound wood according to the proportion of this Figure.

Of clotting
Ground.

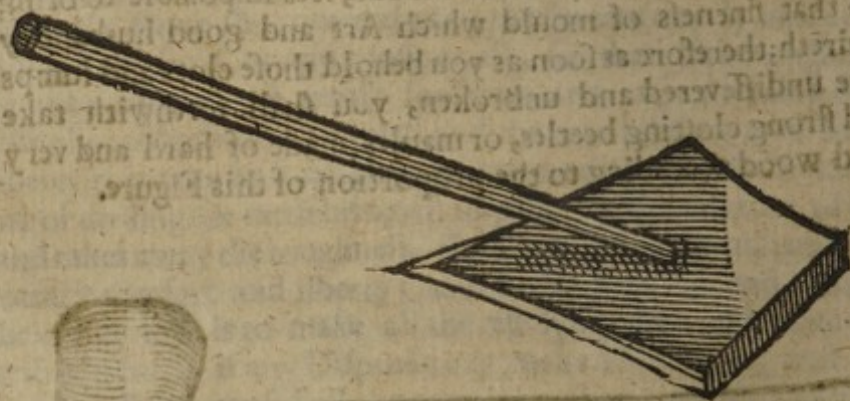


And with these maules or clotting beetles, you shall break all the hard clots and lumps of earth in peeces, even to so small dust as possibly you can, because you are to presuppose that these clots thus hard, tough, and unwilling to be with any means digested into

into mould, are either not at all, or else very insufficiently mixed with the Sand, Lime, and other manures: and therefore you must rather break them that thereby they may mix, and give easie passage to the Graine, and not like heavy poyles and dead lumps ly and press down the Seed so that it cannot sprout.

Another manner of clotting.

But if it so fall out, partly by the hardness of the ill earth, partly through the season and dryness of the year, that these clots and lumps of earth will either not be broken at all, or at least so insufficiently that the mould will not be any thing neer so fine as you would have it; you shall then, having done your best endeavour, let your ground rest till there have fallen a good round shower or two of rain: which may wet the clots through & through; and then the next fair blast you shall take your clotting beetles, but not those which you took before in the dry season, but some much lighter, broader and flatter, being made of thick Ash-boards more than a foot square, and above two inches in thickness according to this figure.



And with these flat maules and beetles, you shall break all the unbroken clots and lumps of earth which shall trouble or annoy your ground, making your Lands as plain and smooth as is possible, so that the grain may have easie passage forth; which labour as soon as you have finished, you shall then refer the increase and prosperity thereof unto the mercies of God, who no doubt will give his blessings according to thy labour and thankfulness.

As touching the trimming and weeding of this Corn, after *Of weeding.*
 it is sprung a foot above the earth, or thereabouts, you shall understand, that these hard barren grounds are very seldom troubled with weeds; for weeds, especial great, strong, and offensive weeds are the issues of rich and fertile soyles; yet, if through the trimming and making of this earth (which is not commonly seen) you do perceive any store of thistles or other grosser weeds to spring up, you shall then in the moneth of *May*, with hooks, nippers, and such like tooles, cut them away or pull them up by the roots, which indeed is the better manner of weeding.

Now here is to be understood, that your ground being thus dressed and trimmed as is before shewed, you may very well for the two first yeares sow Wheat or Rye upon it, but Wheat is the greater profit and more certain seed; the third year bestowing but your fold of Sheep upon it, that is, manuring it with your sheepe, (for it is to be intended, that in these barren earths sheep are the greatest stock of which the Husbandman can boast) you may very well sow it with barley, & have a fruitfull and plentiful crop thereon the next three yeares, you may sow it with Oats; and the seventh year you may sow it with small white Garden Pease or Beanes, according as you shall find the strength and goodness of the ground, (for beanes desire somewhat a richer soyl then the Pease) then for three or four years following the seven, you may let it lye at rest for grass, and doubtless it will yeeld you either as good pasture, or as good Meadow as you can reasonably require. And then after the expence of this time, it shall be good that you dress & order your ground again in such sort as was formerly declared; and thus you may every year dress one or other piece of ground, till you have gone over all your ground, or at least as much as you shall think expedient; and without faile, he that is Master of the most fruitfulest and richest soyl, shall not boast of any greater increase then you shall, onely your charge may be a little more, and so shall be also your commodity, which shall make an amends for your charge; as for your soyles, yours shall be much the lesse, by a just computation; for though you have many labours, yet they are but Summer labours, and neither hurt your owne body, nor your
 F Cattell

Several seeds
 severall yeares.

Cattell: whereas the Master of the rich soyl is in continuall work both Winter and Summer, labouring twice so much to confound the superfluous growth of weeds, as you do to beget the increase of Corn; and whereas he must ever keep a third or fourth part of his Corn ground without fruit, you shall not keep any which shall not yeeld you a sufficient commodity.

Objection. Now me thinks I hear in this place to be objected unto me, that whereas I do prescribe the sanding of these barren earths with the salt Sea-sand, and no other (as it is true, for all other fresh sand is unavaileable) what if the ground doe lye so farre within the Land, that there is no salt sand within many score miles of it, how then shall I make good my barren earth? sure to fetch sand so farre will never equall the cost; or it may be this experience hath no further limits then to such hard and barren earths as lye alongst the Sea-coast onely.

Answer. To this I answer, that al-be this salt Sea-sand be of infinite good and necessary use, inriching grounds wonderfully much, yet is not this experience of bettering of barren soiles so strictly bound thereunto, but that without any use of the same, you may make your earth as fruitfull in Corn or Grasse, as hath been already formerly declared.

Ordering Earth where sands wanteth. Therefore if your ground lye much within the Land, and farre from the Sea, so that this commodity of sand is not by any possible meanes to be gotten, then you shall (having first lookt into the nature of your ground, and finding it to be by all characters and faces a cold, barren, stiff, dry Clay, yeelding nothing but a short mossie grasse, without any other burthen at all, as is seen upon most plaines, and Downes of this Kingdome) first plow it and hack it as was before shewed in the former part of this Chapter, then in stead of sanding it, you shall lime it as aforesaid, or rather a little more plentifully, then you shall manure it, after (as at seed time) you shall plow it and hack it again, then harrow it as before said; then to every acre of ground you shall take two bushels of very dry bay salt, and in such manner as you sow your Wheat, you shall sow this salt upon the ground, then immediately after the sowing of the salt, you shall sow your Wheat, which Wheate would be thus prepared before you sow it; the day before you are to sow your grain, you shall

Sowing of Salt.

shall take bay salt and water, and mixing them together make a brine so strong that it will bear an egge, then put the Wheat you are to sow into that brine, and let it steep therein till the next day, then drain it as clean as may be from the brine, and so sow, harrow it, clot it, and weed it as was before declared, and no doubt but you shall find a marvellous great increase thereby: for this I can assure you, both from a most certain knowledge, and a most worthy relation, that a gentleman buying some store of seed-Wheat, and inforst to bring it home by Sea, by some casual means some of the sacks at the unlading, fell into the Sea, and were much drencht in the salt-water, wherat the Gentleman being grieved (as doubting some hurt to come to the seed) yet inforst of necessity to make use thereof, caused all the Wheat which was so wet to be sown by it self in a particular place, and upon the worst ground which he had, (as much despairing in the increase thereof) and it is most infallibly true, that of that wet Seed, he received at least five-fold more profit than of any other; & from thence it came, that this experiment of Brine & the sowing of salt hath taken place; from which the painfull husbandman hath found such infinite increase to arise, that the use thereof will never be layed down in this Kingdome. Neither is the thing it self without good and strong probability of much increase and strength for the bettering of all manner of arable grounds; for there is nothing which killeth weeds, quicks, and other offences of the ground so much as saltness: for what makes your Pigeons dung & your Pullens dung to be better for arable grounds than any other dung or manure whatsoever, but by reason of the saltness thereof? by which saltness also, you may judge the strength and heat thereof, insomuch that the proper taste of fire, or any hot thing is ever salt; also we say in Philosophy, that blood which carrieth the vitall heat and warmth of the body is in taste salt, and so a nourisher, maintainer, and increaser of all the strength and vigour of the inward faculties; whereas Flegme, Choler, and Melancholly, which are the hurts and confounders of the vitall spirits, the first is in taste sweet, the second bitter, and the last of an earthy and dry taste, full of much loathsomeness.

Now againe you shall understand, that as you thus wet or
 Of steeping
 Seed in brine.

steep your Wheat seed, so you may also steep any other Seed; as barley, oats, beans pease, Lupins, Fetches, and such like; of which your beans, pease and Lupins, you may steep more than any of the rest, and your Oats the least.

As touching Rye, it shall be good not to steep it all, for it is a great enemy to all manner of wet and moysture, inso-much, that the curious Husbandman will forbear to sow it in any shower of rain, bearing in his mind this antient adage or saying, that *Rye will drown in the hopper*; as on the contrary part, *Wheat would be sown so moist, that it might stick to the Hopper*: yet notwithstanding, when you do sow Rye in any of these In-land and cold barren Countries, where sand is not to be gotten, you shall not by any meanes omit the sowing of your salt before, for it is nothing neere so moyst as it is warm and comfortable.

CHAP. 3.

Of the ordering, Tilling, and Dressing of all rough Barren Clayes, whether simple or compound, being laden and over-run with Gorse, Broom, and such like.

NExt unto these plain barren earths, which by reason of their heights, are subject in the Winter time to all manner of cold, frosts, storms, tempests, blasts, and winds, which are the perfect hinderers of all encrease and growth; and in the Summer time to all hot scorchings, scaldings, and fiery reflections of the Sun, which on the contrary part, burneth and withereth away that little seeming increase which appeareth above the earth; I will place that barren clay, whether it be mixt or unmixt, which lying not so high, and being subject unto those hurts and offences, seemeth to be a little more fruitfull, yet either by the extreme cold moysture thereof, or the stony hardness and other malignant qualities, is no lesse barren than that of which I have formerly written, which indeed is that barren and vile soyl, which will neither beare corn nor grass, but is only over-run and quite covered

over with great, thick, and tall bushes of Gorse or Furrer, which is a most sharp, woody, and gross weed, so full of prickles, that neither Horse, Beast, Sheep, nor Goats, dare thrust their noses to the ground to gather up that little poor grass which groweth thereon. And albeit these Gorse or Furs are one way a little commodity to the needfull Husbandman, in being a reasonable good fuell, either for baking, brewing, or divers other sudden and necessary uses; yet in as much as the profit being compared with the great quantity of earth which they cover and destroy, and which with good Husbandry might be brought to great fruitfulness, is indeed no profit at all; it shall not be amiss for every good Husbandman that is pesterd and over-laden with such ground, to seek by way of good Husbandry how to reduce and bring it to that perfection and excellency which may be best for his own particular commodity, and the generall good of the Kingdome wherein he liveth.

Then is there another kind of soyl which is nothing at all differing from this, but is every way as barren and sterile, (which is as noysome a weed as the former) and though it have not such sharp prickles as the other, whereby to hinder the grazing of Cattell; yet doth it grow so close and thick together, and is naturally so poysonous and offensive to grass, that you shall seldome see any grow where this Broom prospereth; besides the bitterness thereof is so unpleasant and distastfull to all kind of cattell, that not any will ever crop or bite upon the same, only it is of some necessary use for the poor husbandman, in respect that it serveth him both for fewell, for thatching and the covering of his houses, (being for that purpose, of all, the longest lasting) and also for the making of Beesomes for cleansing of the house and barns, or else for sale and commodity in the market; all which profits (as before I said) being compared with the loss of the ground, and the goodness that might be reaped from the same, are indeed truly no profits but hindrances.

Therefore I would wish every man that is Master of such grounds, whether they be overrun with Gorse, Furrer, Broome, or any such kind of gross, woody, or substantial weed, first to cut

Destroying
of weed. s

up the weed (of what sort soever it be, whether Gorse, Furs or Broome) as close and neare to the ground as you can possibly, and then making them up into sheafes or bigge faggots, carry them home and stack them up very dry, so as no rain may enter or pierce into them, for the smallest wet will rot and consume them to dirt and filthiness; which done you shall make Labourers with hacks, picks, and such like tooles, to stub up all the roots which you left in the ground, even to the very bottome of the same; and these roots you shall be very carefull to have stubbed up exceeding clean, by no meanes leaving (so neare as you can) any part or parcell of the roots behind you; then those roots thus stubbed up, you shall diligently gather together into little heaps as bigge as Moale-hills, and place them upon the ground a pretty distance one from another, and so let them lye till the Sunne and wind have dryed them: for it is to be intended, that this labour must begin about the latter end of *Aprill*, and beginning of *May*.

Burning of
baite.

Then so soon as you find these roots are thorowly dried, you shall pile them handsomely together, laying them a little hollow one from another, and then with a hack cut up some of the same earth, and therewithall cover all the roots quite over, onely leaving a vent-hole at the top, and on one side, and so let the hills rest two or three dayes, till the earth be a little parcht, and dried, then take fire and some other light dry fuell which is aptest to blaze, and with the same kindle every hill, not leaving them till you see them perfectly on fire: which done, let them burn both day and night, till the substance being wholly consumed, the fire go out of it own self, and this in some Countries is called the *Burning of Bait*.

Breaking of
the burnt earth

Now as soon as the fire hath been extinguished for 2 or 3 dayes, you shall then come, and with shovels (and beetles to break the hard burnt earth in peeces) you shall spread all the ashes clean over the ground; which done, you shall with a very long plough tear up the earth into great and deep furrowes, and divide it into Lands, as you shall think meet and convenient, laying them higher, or flatter, as you shall have occasion, and as the ground lyeth more or less within the danger of water, whether it bee the over-flowing of some neere neighbouring Brooks

Brooks or Rivers; or else other standing water occasioned by Raine and extraordinary Showers, which must be carefully lookt unto; because all over-flowes and inundation of water is a mighty destroyer and consumer of graine: but these barren grounds of which I now write, are very seldome oppress'd with water; for most commonly they lye so high, that the continual drynesse thereof is a strong occasion of the much unfruitfulness. After you have thus burnt your baite, and plowed up your ground, you shall then with your hackes hacke it into small pieces, in such manner as was declared in the former Chapter; then you shall (if the bee any thing near you) sand it with salt sand (as before said) then lime it, and after, manure it either with Oxe dung, Horse dung, rotten Straw, mudde of Ponds and Ditches, the spiteling of House-floores, or sweepings of Channels and Streets, or such like; or for want of all these, in case you dwel neer unto the Sea-coast (where manure for the most part is in greatest scarcity, and the hardest to be come by) you shall gather from the bottome of the rockes (where the seyde of the Sea continually beateth) a certain black weed, which they call Hemp-weed, having great broad leaves, and growing in great abundance, in thick tufts, and hanging together like Pease-straw; and with these weeds you shall cover your lands all over of a pretty good thickness, and then forthwith you shall plow it againe somewhat deeper, and with somewhat greater furrowes then before, raising up the new quick earth to intermingle, and mix with those manures and helps which you had formerly prepared and laid upon the ground; then you shall againe hack it and harrow it; then shall you take Pigeons dung, or Pullens dung (that is, any kind of land fowl whatsoever, but by no means any water-fowl) or Pigeons dung and Pullens dung mixt together, and allowing to every acre two or three bushels thereof, which is the true quantity of seed proportioned for the same, and this dung being broken and masht into small pieces you shall put into your Sydlop or Hopper, and in the same manner as you sow your corne, you shall sow this dung upon the ground, and then immediately after it you shall sow your Wheat, either steeped in brine, or else salt Sea-water, or unsteeped, as you shall think good, but in case you can neither get salt sand

Causes of unfruitfulness.

Causes of unfruitfulness.

An excellent manure.

Of Plowing.

Of divers manures.

Mixture of manures.

sand nor Sea-Rock-weeds, then you shall by no meanes omit the steeping of your Seed; neither shall you faile before you sow your Seed, to mix with your Pigeons and Pullens dung, a full equall part of Bay-salt well dried and broke, and so sown with the dung upon the land, and then the seed after it; which done, you shall harrow it again, clot it, sleight it, and smooth it, in such sort as was formerly declared in the former Chapter, for these labours have no alterations, but must in all points be done as was before set down.

Of weeding.

Now touching the weeding of this earth, after the Corn be-
ginneeth to grow above the ground, there is no fear to be had ei-
ther of Thistles, Tares, Cockles, Darnell, Docks, and such like
strong weeds, which indeed are the issues of good ground ill
ordered and handled: but the weeds which you shall most fear
in this place, is young Gorse, or Furrs, or else young broome,
which are very apt to grow from the least part or parcell
of roots that shall be left behind; nay the very nature of those
barren earths is such, that of its own accord it will bring forth
those weeds, the cold sharpness of the ayr mixing with the sterili-
ty & roughness of the earth, being the cause that it wil give life
to no other better plants; therefore so soon as you shall behold
any of them to appear above the earth, though they be not half a
finger high, you shall presently with all diligence pull them
up by the roots, and cast them away, or lay them in heaps that
they may be afterwards burnt, and the ashes sprinkled upon the
ground: and herein is to be observed, that the younger and the
sooner that you do pull up these weeds, the better it is, and the
easilier they will come from the earth, and the sooner be de-
stroyed: for all those mixtures wherewith already you have
been taught to mixe your earth, are in themselves such naturall
enemies to all these kind of barren weeds, that should you o-
mit the manual labour of destroying them (which no good hus-
band willingly will do) yet in time the earth of it self, and the
often plowing of the same would leave no such offence of weeds
or other growths which might hinder the corn.

Time for weeding.

Now touching the best time when to pull away these weeds,
though generally it must be done as soon as they do appear
above the ground; yet it shall not be amiss for you to defer the
work

work till after a shower of raine, and then immediately after the ground is wet (and so by that meanes more apt and willing to open and forsake the root fastned within it) you shall with all diligence pull them out of the ground, and destroy them: neither shall you pull them out of the ground with your hands onely; for the Gorse have exceeding sharp prickes, so that with your naked hands you are not able to touch them, and to arme your hands, against them, with strong thick gloves, wuld be too boisterous and comberfome, so that sometimes you might either misse the weeds, and pull up the Corn; or else pull up the Corn and weeds both together; therefore to prevent all these casualities or hinderances, you shall take a pair of long small wooden Nippers, made after the form of this figure.



And with these you shall pull the weeds out of the ground, and cast them into the furrows by the sides of the Lands, till your dayes work be finished and then with a rake you shall rake them together, and so lay them in heaps to dry and wither, in more convenient places, that when time shall serve, you may burn them, and use them, as was before declared.

Lastly you shall have great respect, that if this ground be very much troubled with loose stones, as flint, pibble, & such like, that then you very carefully get them gathered from the ground, both before and after you have plowed it, and to lay them on heaps in other vacant places, where they may serve for pavings, and such like purposes when time requireth: but if the ground be over-run with great or else small limestones, as for the most part these barren grounds are; then shall you with all care gather them up, and lay them in great heaps in some corner of your field where you may make a convenient lime-kiln, and so there burn these stones thus gathered, which will be

Gathering of
stones.

both an infinite profit, and an infinite ease to the rest of your labours.

CHAP. 4.

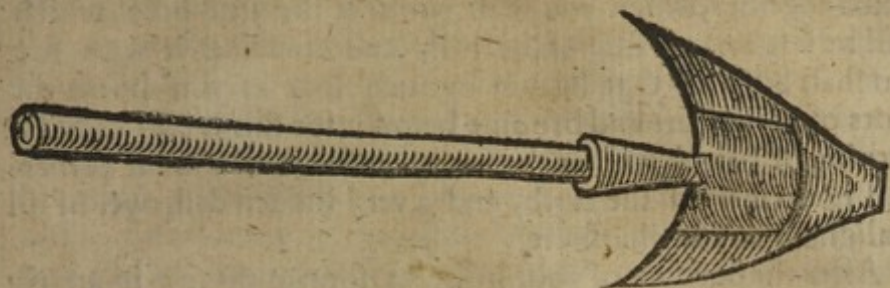
Of the ordering, Tilling, and dressing of all rough barren Claves, whether simple or compound, that are over-runne with Whinnes, and such like.

NEXT unto this barren Clay which is over-run with Furs, Broome, and such like, I will place that barren and unfer- tile earth, being also a Clay, whether simple or compound, which is over-runne onely with Whinns, and indeed bearing little or no other burthen, or if it doe beare any other burthen as some little short mossie gras, yet is that gras so covered over with these sharp Whinnes, that not any beast dare put his nose to the ground, or bite upon the same; and indeed this kind of earth is not any whit at all lesse barren than those of which I have already written, but rather more, in that the malignant qualities thereof are not so soon corrected, nor yet the vertues so soon restored.

What whinnes are.

Whinnes are a certain kind of rough dry weeds, which grow bushie and thick together, very short and close unto the ground, being of a dark brown colour, and of crooked growth, thick and confused, and full of knots, & those knots armed with hard, long, sharp pricks like thorns or bryars, they have little brown leaves which shaddow the pricks, and do wind their branches so one into another, that they can hardly be separated, yet is their growth at any time little more than a handfull above the earth, onely they spread exceedingly, and will run and cover over a whole field, choaking up all sort of good plants whatsoever, and turning the best gras that is to moss, and filthiness: wherefore if at any time you be Master of any such naughty and barren ground, and would have it reduced unto goodness and fertility you shall first take a fine thinne paring shovell made of the best iron, and well steeled and hardned round about the edges, according to the forme of this figure following,

And



And with this paring-shovell, you shall first pare up all the upper swarth of the ground, about two inches, or an inch and a half thick at the least, and every paring would be some three foot in length at the least, and so broad as the shovell will conveniently give it leave, and this swarth thus pared up, you shall first turn the Whinny or grasse side downward, and the earth side upward, and so let it lye two or three dayes in the Sunne to dry (for this work is intended to begin in the month of *May*) and when that side is well dried, you shall turn the other side, and dry it also, then when all the swarth is dried, you shall gather fixe or seven peeces together, and turning the Whinny or grasse side inward, and the earth side outward, you shall make round hollow little hills thereof, much according to the fashion of this figure following.



And the inward hollownes like unto the hollownes of an Oven, but much les in compass; which done, you shall fill the hollownesse with dry chips, or small sticks or Furrs and Straw mixed

mixed together, which you shall put in at the vent-hole which shall be left on one side of the hill, and kindling it with fire you shall burn all that swarth in such sort as you burnt the roots of your Furs and broome before; for this is also called a burning of bait, as well as the former; for it is a most principall nourisher of the earth, and a very sudden destroyer of all malignant weeds whatsoever.

Breaking of
Baies.

After the burning of your hills, as soon as the fire is utterly quenched and gone out, and no heat at all left in the hills; you shall then with clotting beetles beat them all down to dust, and then with shovels you shall spread the ashes quite over all the ground, as was before declared in the former Chapter: and herein is to be noted, that you must place these hills as thick and close together as by any meanes possibly you can, making your hills so much the lesse and lower, that they may stand thicker and nearer together, and so cover more ground, and thereby the heat and strength of the fire to disperse it self over all that peece of ground; for the fire burning upon the earth, doth as much good for the enriching of the earth, and destroying of the weeds, as the ashes doth which are spread upon the same.

Plowing.

Now after your bait is in this manner burned and spread, you shall then (as was before shewed) plow up your ground in good large furrrows, then hack it very small, Sand it, Lime it, and manure it; and of all manures, there is not any better for this ground than Oxe-dung and ashes well mixt together; of which ashes, those of bean straw, Pease-straw, or any other straw are best; and those of Wood or Fern next, and those of Sea-coal or Pitcoal are the worst of all: Swines dung is not much amiss for this ground, for though it be a great breeder of weeds and thistles in good & fertile grounds, yet in this cold hard & barren earth it worketh no such effect, but is a great comforter and warm moystaer of the same.

After you have thus made your ground, as soone as Wheat seed-time commeth, which is the latter end of *September* and beginning of *October*, you shall then with great care plow over your ground again, and take great respect that you turn up your furrows much deeper than before, and that for two speciall causes;

causes; the first, that the new earth may the better mixe with the old earth, and those helps that are added thereunto; and secondly, that you may be sure to tear up the roots of all the Whinnes from the very bottome of the earth, not suffering any part of them to remain behind, and for this purpose it shall not be amiss to have an idle boy or two to follow your plough, and to gather away all the roots that shall be torn up, or any way else left bare above ground, which roots shall be laid on heaps in convenient places, and then after burnt, and the ashes thereof spread upon the ground: which will be a very great comfort unto the seed, being a speedy help unto the sprouting thereof, and a very warm comforter of the root after the stemme is spindled above ground, for in these cold barren earths, nothing doth so much spoyle and slay corn, as the dead coldness which lyeth at the root thereof; for in many of these unfertill places, you shall see Corn at the first sowing (whilest there is a little strength in the ground) sprout in great abundance, promising much hope of the profit: but when it should spindle and come to much better perfection, that poor strength being spent and consumed, and the cold and drynesse of the soyl, having as it were overcome all matter of comfort, then presently you shall see the blade of the corn turn yellow, the stem or stalk to wither, and either put forth no ear at all, or else a very poor little empty one, being laden with nothing but a most dry chaffie husk without substance. But to come again to our purpose, after you have thus plowed up your ground the second time, you shall then hack it againe, and harrow it, as was declared in the former Chapters; then you shall take your seed-wheat which hath been steeped either in brine or Sea water, and to every bushell of that Seed you shall adde a bushell of bay salt, and mix them very well together in your Hopper or Sydlop, and so sow them together upon the ground, observing to double your casts so oft, that you may not fail to cast that true quantity of seed into the earth which otherwise you would have done if so be there had been no mixture at all, for to do otherwise were to deceive the ground, and a handfull of seed so saved would be the loss of a peck in the time of Harvest; therefore have great respect that your ground have his due; for it is no

- more cost, though it be a little labour.
- Harrowing.** When your seed is sown, you shall harrow it again the second time, close, smooth it and flight it, as was before declared in the former Chapters.
- Weeding.** As touching the weeding of this ground, it is the least labour of all other, for the earth being so corrected as is before shewed, it will naturally of it self put forth no weeds, especially if you remember to plow it deep, and be sure to tear up and gather away all the quick roots, otherwise if that labour be any thing neglected, then will it put forth both Whins and great store of other rough weeds, which as soon as you shall perceive to appear, you shall presently with your wooden nippers pull them up by the roots, as was at large declared in the foregoing Chapter.
- Profits.** Now for the generall profit of this ground thus made and prepared, it is the same that the two former are, that is to say, it will bear you good and sufficient Wheat, in plentiful abundance for the space of two or three years, then barley a year after; then Oates three years together after the barley; and pease or beans a year after the oates; then lastly very good Meadow or Pasture, for the space of three or four years after, and then you shall begin and dress it again, as was formerly declared.

CHAP. 5.

Of the ordering, Tilling, and Dressing of all barren Clays, whether simple or else compound, which are over-run with Ling or Heath.

THere followeth now successively another sort of barren earth, which indeed is much more sterile and barren than any of the other formerly written upon: because they out of their own natures, do beare a certain kind of grasse or food which will relieve ordinary hard store-cattell, whether it be Sheep, Goats, or young beasts; But this earth of which I am now to entreat, beareth no grasse at all, but only a vile filthy black brown weed, which we call Ling or Heath, the tender tops whereof Cattell and wild Deer will sometimes crop, yet it is to them but little relief, and only maintaineth life and no more.

Now

Now albeit some may object unto me, that this kind of soyl is ever a sandy soyl and no clay, as may be seen in most Chases, Forrests, and Downes; yet I answer, that albe it hold so in generall; yet there are divers claves, especially in mountainous Countries, that are pestered with these kind of weeds, as may be seen in the North and North-west parts of *Derbyshire*, in some parts of *Cornwall*, and in many parts both of North and South *Wales*; and these clay grounds which are thus offended with these weeds of Ling or Heath, are much more barren and unfruitfull than the sands, because of their much more coldness; yet those claves which are mixed with either black Sand, dun Sand or yellow Sand, and over-run thus with Heath or Ling, are the most barren of all. To make any further description of this Heath or Ling, being a thing so notoriously known over all this Kingdome, I hold it meerly needless, onely to say it is a rough brown weed, shooting out abundance of stalks from one root, with little dark leaves, and flowers on the top, of a pale reddish colour, much inclining unto Peach colour at the first, but being full blowne, they are then a little more whitish.

You therefore that have any such ground, and desire to bring it to fruitfulness, and the bearing of good corn and grafs in a reasonable abundance, you shall first with sythes or sharpe hooks (but old sythes are the better) cut down all the Heath, or Ling, which groweth upon the earth you intend to convert to goodnesse so neer the ground as possibly you can; then when it is cut down (which would ever be at the beginning of the Month of *May*) you shall let it lye upon the ground, daily tossing and turning it till it become very dry, then spreading it all over the ground, and mixing or covering it with dry straw of any kind whatsoever, you shall presently set it on fire in so many severall corners of the field, that all these severall fires in the end may meet in one point, and not leave any part of the mowen Heath or Ling unburnt, or any part of the ground unsciorched; after this is done, and the ground cooled, you shall with your flat clotting beetles beate the ashes hard into the ground, then you shall take a strong plow, with a broad winged share and an even coulter, and you shall plow up all this ground thus burnt

Destroying of
Heath.

Another burning of baite.

in very large and deep furrowes, by no means picking out any of the quick roots which shall remaine in the furrows so turned up, but letting them rest in the earth still; then with your haks, and the help of your iron paring shovell, you shall cut up the furrows, formerly turnd up, into short pieces of three foot, or three foot and a half long, and some less as occasion shall serve: then with these pieces, you shall build little hollow hills, such as in the former Chapter you made of the upper swarth of the ground onely; and then filling the hollownes with dry heath, and dry straw mixt together, you shall set every hill on fire, and so burn the very substance of the earth into ashes, which will soone be done by reason of the Infinite number of roots and small strings, which lye mixt in the earth, and the drynes thereof occasioned by the former burning: And this is another kind of burning of baite, much differing from all the former, and yet to as great end and profit as any whatsoever; and these hills must, as the former, be placed one as near another as is possible, so as they may spread and cover over the greatest part of the ground, and leaving no more then a good reasonable path to pass between hill and hill.

Now as soon as you have thus burned all your bait, and that your hills are cold, you shall then as was before shewed in the former Chapters, with beetles and shovels break down the hills, and spread the earth and ashes over all the ground; which done, you shall sand it (if the situation of the ground bee answerable therunto) and lime it in such sort as was shewed in the second Chapter; then when it is limed, and the lime equally spread, not more in one place then in another, you shall then manure it with the best manure you can provide, of which there is none better or more proper for the ground than mans ordure, and the rubbish, sweepings, parings, and spitlings of houses mixt together: for want of this (because it may not bee in so great plenty as other manures) you may take either old Oxe dung, or horse dung, or for want of them the old rotten and muddy staddles or bottomes of Corn stacks or reeds, especially Pease-stacks, or Bean stacks; provided that it be thoroughly rotter; for the lesse rotten it is, the worse it is: Also the scowrings of common Sewers, and especially those through

through which much of mans urine doth pass is a most wonderfull and beneficiall manure for these grounds, so are also the scowring of sinks and channells which come from Kitchens and wash-houses, where great store of Brine and salt broath is shed, and other greasie, fat and putrified substances, as also abundance of sope suds, and buck-ashes, and other sope and lee washings, then which there is no better manure that can be used for these kind of grounds.

After your ground is thus perfectly made and manured, and that Wheat seed time doth draw on, which (as before was shewed) is ever at the latter end of *September*, you shall then plow up your ground again in that manner as was shewed for the former earths, to wit, much deeper then before: for you are to understand, that this ground being drest as is before declared, there wil remain nothing of the furrowes which were first plowed up, but the ashes, which being covered with sand, lime, and manure, the earth will lye plaine and levell, so that of necessity you must raise up new furrowes of new earth, which being done, you shall then with your hackes, cut all the new earth into very small pieces, mixing them well with the other mould made of sand, lime, manure and ashes; then as was before said, you shall harrow it to make the mixture so much the better, and the mould so much the finer; and then if it have been sanded, you may sow your Seed-wheat simply of it selfe, without any doubt of the plentifull increase thereof; but if it have not been sanded, then as in the foregoing Chapter, you shall not onely steep your Seed in brine (as before shewed) but also you shall mixe your Seed with Bay salt, and so sow it into the ground; or if at the time of sowing (after it is plowed, hackt, and harrowed) you bestow either Pigeons dung, or Pullens dung, or Sheepes dung upon the land, it will be much better, and the corn will give a much greater increase. Now as soon as your land is sown, you shall then forthwith harrow it againe, and cover the seed very close; then you shall clot it, (smooth it, and sleight it (as was before shewed.)

As touching the weeding and clenfing of this earth after the Corn is sprung up, you shall understand that there is great care to be had thereunto, for this ground is much subject unto weeds,

Of Weeding.

H

and

and those of the worit kind: for although for the most part it will be free from all manner of soft and tender weeds, as thistles, cockle, darnell, ketlocks, docks, rape, and such like herball stuffe, yet it is much subject to twitch bryars, which grow at both ends, ling, Wild time, and such like, any of which as soone as you shall see appear or peep above the earth, you shall presently with your Nippers pull them up by the roots, and not suffer them in any wise to look a hardfull above the ground, for if you do, their hardness is so great, and their roots so large and fast fixt in the mould, that you can by no means pull them away without great losse and hurt to the grain, pulling up with them all such roots of Corne, as shall be fixed near about them: for any other weak and superfluous things which shall grow from the Land, you may with ordinary weeding hooks cut them away; as for long grass, whether it be soft or sedge, or any other such like stuffe, you shall not stirre it, but let it grow: for it keepeth warm the roots of your Corn, and giveth nourishment and increase thereunto. Now for the profit of this soyl thus ordered and husbanded, it is equall with any of the former, and will bear Wheat very plentifully for the space of the three first yeares; good barley the fourth year, with the help of the sheep fold (as was before said) and good Oats the fifth, sixth and seventh years; and very good small Pease the eighth year (for beanes this soyl will very hardly bear at all) & the ninth, tenth & eleventh year it will bear very good meadow (though not altogether very fine pure grass, yet very good feeding & wholsom grass) or so good pasture as a man can reasonably require for any holding Cattell whatsoever; nay, it will also indifferently well feed, and fat Cattell, though peradventure it requireth a little longer time than other finer grounds will.

C H A P. 6.

Of the ordering, Tilling and Dressing of all plaine simple barren Sands, bearing nothing but a short mossie grass.

HAVING thus (in as large manner as I hope shall be needfull for any judicious or indifferent Reader) written of the Natures, Orderings, Plowings and Dressings of all manner of barren

ren and unfruitfull Clayes, whether they be simple of themselves, or else compounded with other earths, as sands, chalks, gravels, and such like; shewing by those naturall burthens which continually of their own accords they produce (which indeed is the easiest and safest way of knowledge) how to amend and better them, and bring them to that perfection of fruitfulness, that the best earth shall but in a very small degree exceed them, nay, hardly any thing at all, except in the saving of a litle charge and some labour, without which nothing is to be obtained by the Husbandman; neither is this charge or labour thus bestowed on these barren grounds to be grutcht at by any honest mind; since the worst crop of ten or eleven, will make good his charge and toyl with a reasonable interest; so that I make account, nine or ten years profits come into his barns without purchase, for it is to be intended that all these earths formerly spoken of, are not to be dressd, or to put the Husbandman to any charge more then the first year of ten or eleven, for the second year he shall as soon as he hath gathered his Wheat off, which will be in *August*, and finishd other parts of his Harveest, presently put his Plow into the same Wheat-ground again and plow it up, hack it, harrow it, sow it, harrow it again, clot it, and weed it, as in the former year, and so consequently of all the rest of the years following, whereby you perceive that all labours and charges are saved more than once plowing and sowing.

This then considered, it necessarily now followeth that I speak of the bettering and bringing into perfection of all manner of barren Sand-grounds, being simple of themselves, without any mixture of other earths, except one and the same kind, as Sand with sand, though peradventure the colours of the sands may alter: as red with white, yellow with black, &c. which in as much as the whole substance is sand without any contrary mixture, therefore it may well be called simple and not compound: and of these sands, I purpose to entreat, as formerly I did of the Clayes; that is to say, by their outward faces and Characters, which are those burthens and increases which of their own proper nature, without any help or compulsion of any others, they produce and bring forth into the world.

Plowing.

And first of that naughty cold and barren sand which lying upon high, stony, and mountainous Rocky places, or else upon lower cold bleak Plaines, subject to the North and North-east winds and tempests, or bordering upon the Seas, doth not bring forth any thing but a short mossie grass, which the Sun maketh bitter, and the cold dewes fulsome and unflavoury in tast. If any man then be master of such unprofitable and unfruitfull earth, and desire to have it brought to goodnes, and perfection, you shall, first, at the beginning of the Spring, as about midde *Aprill* or earlier, with a strong Plow answerable to the soyl, yet somewhat lesse both in timbers and irons then that wherewith you plow your Clay grounds, plow so much of that earth up as you may conveniently compass to sow and dress exactly & perfectly; for to undertake more, were to make all unprofitable, and to cast away much labour and charge without any profit. This ground you shall plow of an indifferent depth, though not so deep as the Clays, you shall lay the furrows though flat, yet close one to another, without leaving any balke between, but plowing all very clean, yet not so very clean and close together, that you may lay the green swarth to the new plowed or quicke earth; but rather turn one swarth against another, so as the furrows may lye, and no more but touch the edges one of another. This when you have done you shall then with your hacks cut and break all the earth so turned up into very small pieces, and not onely the earth so turned up into very small pieces, but also other green swarth which was left unplowed; provided, that before this labour of hacking, you let the ground lye certaine daies in the furrows, that one swarth heating and scalding the other, they may both equally rot and grow mellow together, which once perceived by the blacknes thereof, you may then at your pleasure hack it and cut it; as is before declared.

Objection.

Now some may in this place object unto me, that this labour of hacking should be needless, in as much as all sand grounds whatsoever are out of their own natures so light, loose, and willing to disperse, that this toyl might very well and to good purpose be saved,

Answer.

To this I answer, that true it is, most sands in their own natures

tures are loofe, and light, and willing to diffever into fine mould without any extremity, especially rich and fruitfull sands, whose predominant quality of warmth giveth nourishment and increase; but these barren and cold sands, in which is a certain flegmaticke toughnes and most unwholesome dryness, are of a clean contrary nature, and through the stony hardnes thereof, they are as unapt to break and diffever as any Clay whatsoever: besides, the swarth being of a tough mossie substance (which ever carrieth a hard strong root answerable with the cold in which it is ingendred) doth so constantly binde, fetter, and hold the mould together, that it is impossible for any harrow to break it in pieces, or to gather from it so much mould as may serve to cover the Corn and give it root when it is sown into the same: and therefore this work of hacking is necessary.

When therefore you have thus hackt your land and distributed the mould into many small pieces, you shall then with all expedition marl it; which forasmuch as it is no generall nor common practice in every part of this Kingdome, I will first tell you what marle is, and then how to find it, digge it, and use it for your best behoof.

Marl, you shall then understand, is (according to the definition of Master Bernard Pallissy) a naturall, and yet an excellent soyl, being an enemy to all weeds that spring up of themselves, and giving a generative vertue to all seeds that are sown upon the ground: or (for the plain husbandmans understanding) it is a certain rich, stiffe, and tough clay, of a glewie substance, and not fat or Oily, as some suppose. This Marle is in quality cold & dry, & not hot (as some would have it) and it was earth before it came to bee Marl, and being made Marle yet it is but a clay ground; all Chalke whatsoever was marle before it was Chalk, and all manner of Stones which are subject unto Calcination or burning, as Lime-stone, Flint or the like, were first Marle before they were stones, and onely hardned by accident and so not possible to be dissolved but by fire: as for Marle it self, when it is a little hardned, it is onely dissolved by frosts and nothing else, and thence is the cause that Marle ever worketh better effect the second year then the first.

This Marle hath been made so precious by some writers, that

it hath been accounted a fift element, but of this curiosity I will not now dispute.

Touching the complections or colours of Marle, there is some difference, for though all conclude there are four severall colours in Marle, yet one saith, there is a white, a Gray or Russet, a Black and yellow; another saith, there is a Gray, a blew, a yellow and a red; and a third saith there is a red and white mixt like unto porphery, and all these may well be reconciled, and the colours may alter according to the climat and strength of the Sunne: So that by these Characters, the colour, the toughness, and the loosness when it is dried, any man of judgement may easily know Marl from any other earth whatsoever. This Marle is so rich in it self, and so excellent for continuance, that it will maintaine and enrich barren grounds, the worst for ten years, some for a dozen, and some for thirty years; yet there is a great respect to be had in laying of this Marle upon the ground, that is to say, that you lay it neither too thick nor too thinne, that you give it neither too much, nor too little; for any of these extremities are hurtfull; and therefore hold a meane, and see there be an indifferent mixture between the Marle and the earth, on which it is laid.

For the generall finding out of this Marle, there is no better way for readines, and the saving of charges, than by a great Augure or wimble of Iron made to receive many bits one longer than another, and so wresting one after another into the ground to draw out the earth, till you find you are come to the Marle, which perceived, and an assay taken, you may then digge at your pleasure.

Now for the places most likely where to find this Marle, it is commonly found in the lowest parts of high Countries, near Lakes and small brooks, and in the high parts of low Countries, upon the knols of small hills, or within the Clifts of high Mountainous banks, which bound greater Rivers in: to conclude, you shall seldome find any of these barren sands but they are either verged about with marle grounds, or if you will bestow the labour to digge below the sand, you shall not fail to find either marle, or some quarry of stone, or both; for in some places Marle lyeth very deepe, in other some places within

a spades graft of the upper swarth of the earth: therefore it shall be good for you to make proof of all the most likely parts of your ground to find out this Marle; and as soon as you have found it out, you shall with mattocks and spades digge it up and carry it to your land, there laying it in bigge round heaps; and setting them within a yard or two one of another; thus when you have filled over all your ground (which would be done with as great speed as might be, for the antient custome of this Kingdome was, when any man went about to marle his ground, all his Tenants, Neighbours and Friends would come and help him to hasten on the worke) you shall then spread all those heaps, and mixing the Clay well with the sand, you shall lay all smooth and levell together; and herein is to be observed, that if the land you thus marle shall lye against the side of any great Hill or Mountain, whereby there will be much descent in the ground, then you shall (by all means) lay double as much Marle, Sand, or other compost on the top of the hill as on the bottome, because the rain and showers which shall fall, will ever wash the fatnesse of the earth down to the lowest parts thereof

Now in the laying of your marle, you are to hold this observation, that if you laye it on hard and binding grounds, then you are to lay it in the beginning of Winter, but if on grounds of contrary nature, then it must be laid in the spring or Summer. Again, you shall observe, that if you cannot get any perfect and rich marle, if then you can get of that earth which is called Fullers earth, and where the one is not, commonly ever the other is, then may you use it in the same manner as you should marle, and it is found to bee very neere as profitable.

When your ground is thus marled (if you beneere to the sea side) you shall then also sand it with salt sea-sand, in such sort as was formerly declared, onely you may forbear to lay altogether so much upon this sand ground as you did on the Clay ground, because an half part is fully sufficient. If you cannot come by this salt sand, then in stead thereof, you shall take chalke, if any be to be had neere you, and that you may lay in more plentifull manner than the sand; and al-be it is sayd, that

Additions:
Observations.

Of Chalke, and
the use.

that chalk is a wearer out of the ground, and maketh a rich father, yet a poor sonne; in this soyl it doth not so hold, for as it fretteth and wasteth away the goodnes that is in Clay grounds, so it comforteth and much strengtheneth these sand earths: and this chalke you shall lay in the same manner as you did your Marle, and in the same manner spread it and leuell it; which done, you shall then Lime it, as was before shewed in the Claye grounds; yet not so abundantly, because also a half part will be sufficient; after your Liming, you shall then manure it with the best manure that you have, whether it be dung of Cattell, Horse, Sheep, Goats, Straw, or other rubbish; and that being done, and seed time drawing on, you shall then plow up your ground againe, mixing the new quick earth and the former soyles so well together, that there may be little distinction between them: then you shall hacke it again, then harrow it, and lastly sow it with good, sound, and perfect seed, and of seedes though Wheate will very well grow upon this earth, yet Rye is the more natural and certain in the increase: yet according to the strength of the ground, you may use your discretion, observing that if you sow wheat, then to steep it before in brine or salt sea-water, as was before described; but if you sow Rye, then you shall sow it simply without any helps, except it be Pigeons dung or Bay-salt simple of it selfe, in such manner as hath been before declared; either sowing the salt with the Corn, or before the Corn, as shall seeme best in your owne discretion.

After your seed is sowne, you shall then harrow it again, clot it, smooth it, and sleight it, as before is shewed in the second Chapter, which done (after the Corn is shot above the earth) you shall then look to the weeding of it, being somewhat a little too much subject to certain particular weeds, as are Hare bottles, wild Chesse-bolles, Gypsic-flower, and such like, any of which, when you see them spring up, you shall immediately cut them away close by the roots; as for tearing their roots out of the ground with your nippers, it is not much material, for the cutting of them is sufficient, and they will hardly ever again grow to do you any hinderance; many other weeds there may grow amongst these, which are also to be cut away, but these are the principall, and of most note; wherefore as soon as you have clen-

sed your lands of these and the rest, you shall then refer the further increase of your profit unto Gods providence,

Lastly, you shall understand that this ground being thus plowed drift and ordered, will without any more dressing, but once plowing and sowing, every year bear you good Wheat or good Rye three years together; then good barley the fourth year; good oates the fifth sixth and seventh yeares; excellent good Lupins the eighth year, and very good Meadow or Pasture three or four yeares after, and then it shall be necessary to dress it again in such manner as was before described.

CHAP. 7.

Of the Plowing, Tilling, Ordering and intricking of all Barren Sands which are laden and over-runne with Braken, Fern, or Heath.

NExt unto this plaine, cold, barren Sand, which beareth no other burthen but a short mossie grass, I will place that Sand which is laden and over-runne with Braken, Fern, or Heath, as being by many degrees more barren then the former, both in respect that it is more loose and lesse substantiall, as also in that it is more dry and harsh and altogether without nutriment, more than an extreme sterile coldnesse, as appeareth by the burthen it bringeth forth, which is Braken or Ferne, a hard, rough, tough weed, good for nothing but to burne, or else to litter store beasts with, for the breeding of manure; or if you strow it in the high-waies where many travellers pass, it will also there turne to good reasonable compost.

Of this kind of ground if you be master, and would reduce it unto fertility and goodness, you shall first, whether the Braken be tall and high (as I have seen some as high as a man on horse-back) or short, and low (as indeed most commonly these barren earths are, for tall Fern or Braken shewes some strength in the ground) you shall with sythes first mow it downe in the month of *May*, then wither it and dry it upon the ground, and after spread it as thinne as you can over all the earth you intend to plow; which done, you shall bring your plow and begin to plow the ground after this order: first you shall turne up your furrow,

and lay it flat to the ground, greene-swarth against greene-swarth, then look how broad your furrow is so turned up, or or the ground so covered, and just so much ground you shall leave unplowed between furrow and furrow, so that your land may lye a furrow and a green balk, till you have gone over all the ground; then shall you take a paring-shovell of iron, and pare up the greene swarth of all the balks between the furrows, at least two inches thicke, and into peeces of two or three foot long, and with these peeces of earth, and the dry Fern which is pared up with them, you shall make little round hollow baite hills, as in the third and fourth Chapters; and these hills shall be set thick and close over all the ground, and so set it on fire and burn it; then when the fire is extinct, and the hills cold, you shall first with your hacks cut in peeces all the furrows that were formerly turned up, and then break down the burnt hills, and mixe the ashes and earth with the other mould very well together; which done you shall then with all speed marle this earth as sufficiently as possibly may be, not scanting it of marle, but bestowing it very plentifully upon the same; which done, you shall then plow it over againe, and plowing it exceedingly well, not leaving any ground whatsoever untorn up with the plow; for you shall understand that the reason of leaving the former balks was, that at this second plowing after the marle was spread upon the ground, the new, quick, and unstirred fresh earth might as well be stirred up to mixe with the marle, as the other dead earth and ashes formerly received, whereby a fresh comfort should be brought to the ground, and an equall mixture without too much dryness, and this second Ardor or plowing would begin about the latter end of *June*.

Of Marle.

Sanding and
liming.

After your ground hath been thus marled, and the second time plowed, you shall then sand it with salt Sea-sand, lime it, and manure it, as was declared in the foregoing Chapter: and of all manures for this soyle, there is not any so exceeding good as sheeps manure, which although of the Husbandman it be esteemed a manure but of one year, yet by experience in this ground it hapneth otherwise, and is as durable, and as long lasting a compost as any that can be used, and besides it is a great destroyer of thistles, to which this ground is very much subject, because

cause upon the alteration of the ground the Fern is also naturally apt to alter unto thistle, as wee dayly see.

When your ground is thus dress and well ordered, and the ^{Plowing and sowing.} seed-time commeth on, you shall then plow it again in such manner as you did the second time, that is to say, very deepe, clean, and after the manner of good Husbandry, without any rest, balks or other disorders, then shall you hack it very well, then harrow it, and then sow it; but by mine advice, in any case, I would not have you to bestow any Wheat upon this soyle (except it be two or three bushels on the best part thereof for experience sake, or provision for your household) for it is a great enemy unto Wheat, and more than the marle, hath no nourishment in it for the same, because all that commeth from the salt sand, lime, and manure, is little enough to take away the naturall sterility of the earth it self, and give it strength to bear Rye, which it will do very plentifully; and therefore I would wish you for the first three years only to sow the best Rye you can get into this ground; the fourth year to sow barley; the fift, sixt and seventh, Oates; and of Oates, the bigge black Oate is the best for this ground, maketh the best and kindliest Oatmeal, and feedeth Horse or Cattell the soundest; as also it is of the hardest constitution, and endureth either cold or drynesse much better then the white Oat, the cut Oat, or any Oate whatsoever; the 8th year, you shall only sow Lupins or Fetches; and three years after, you shall let it lye for grass, and then dress it again as before said; for it is to be understood, that in all the following years (after the first year) you shall bestow no labour upon this ground, more than plowing, sowing, hacking, and harrowing at seed time only.

But to proceed to the orderly labour of this ground, after ^{Labours after sowing.} you have sown your Rye, you shall then harrow it againe, clot it, smooth it, and sleight it, as was before shewed in the second Chapter of this book. And although a man would imagine that the sandy loosness of this soyl would not need much clotting, or sleighting of the Earth, yet by reason of the mixture thereof with the marle and manure, it will so hold and cleave together, that it will aske good strong labour to loosen it and lay it so hollow and smooth as in right it should be.

Weeding-

Touching the weeds which are most subject to this soyl, they are Thistles, and young Brakes or Fernes which will grow up within the Corn, which before, they rise so high as the Corn, and even as it were at the first appearing, you must with your wooden Nippers pull up by the roots, and after take up and lay in some convenient place where they may wither and rot, and so turn to good manure.

CHAP. 8.

Of the Plowing, Tilling, Ordering, and Enriching of all barren Sands, which are laden and over-run with Twitch, or wyld Bryar.

Destroying of
Twitch and
Bryar.

HAVING writtten sufficiently of this hard and barren, wast, wild, sandy ground, which is over-run with Braken, Fern, Heath & such like: I will now proceed, and unto it joyn another sand which is much more barren, and that is the sand that bringeth forth nothing but wild Twitch, bryars, Thorn-bush, and such like under growth of young misliking wood, which never would rise or come to profit, the bitter cold drines of the earth wherein it groweth, and the sharp stormes to which the clime is continually subject both day and night, blasting it in such manner that nothing appeareth but starved, withered, and utterly unprofitable burthens, good for nothing but the fire, and and that in a very simple sort. Such ground if you be Master of, and would reduce it to profit and fruitfulness, you shall first with hookes or axes cut up the upper growth thereof, that is, the bushes, young Trees, and such like; then you shall also stub up the roots, not leaving any part of them behind in the earth, carrying away both home to your house to be employed either for fuell, or the mending of the hedges, or such like, as you shall have occasion; this done you shall take a pair of strong iron harrowes, and with them you shall harrow over all the earth, tearing up all the Twitch, bryars, and rough grass so by the roots, that not any part but the bare earth may be seen, and when your harrowes are cloyed, you shall unlade them in severall places of the ground, laying all such rubbish of weeds and other stufte which the harrowes shall gather up in a little round.

round hill, close up together that they may sweat, wither and dry; then spreading them abroad and mixing them well with dry straw, burn them all over the ground, leaving no part of the weeds or grass unconsumed; then without beating in of the ashes, you shall presently plow the ground all over very clean as may be, laying the furrows as close as you can one to another, and leaving no earth untouched or unturned up with the plow, which done, you shall immediately hack it into small peeces, and as you hack it, you shall have idle boyes to go by the hackers, to gather away all the roots which they shall loosen or break from the mould, and laying them on heaps in the worst part of the ground, they shall there burn them, & spread the ashes thereon; after your ground is thus harrowed, plowed, and hacked, you shall then muck it, as was formerly shewed in the sixth Chapter; then shall you sand it, lime it, and manure it as before-said.

Now of manures, which are most proper for this soyl, you shall understand that either Oxe, or horse manure, rotten straw, or the scowring of Yards is very good, provided that with any of these manures, or all these manures, you mixe the broad-leaved weeds, and other green weeds, which grow in Ditches, Brooks, Ponds, or Lakes, under Willow trees, which with an iron Rake, Drag, or such like instrument, you may easily draw upon the bank, and so carry it to your land, and there mingle it with the other manure, and so let it rot in the ground: this manure thus mixed is of all other most excellent for this soyl, both by the experience of the Antients who have left it unto memory, as also by daily practice now used in sundry parts of this Kingdome, as well because of the temperate coolness thereof, which in a kindly manner asswageth the lime and sand, as also through moysture which distilling through those warm Soyles doth quicken the cold starved earth, and giveth a wonderfull encrease to the seed that shall be thrown into the same.

After your ground is thus sufficiently drest with these soyls and manures, you shall then plow it againe the second time, which would be after *Michaelmas*; after the plowing you shall then hack it againe, & be sure to mixe the earth & the manures very well together, then you shall break it in gentle manner

Manure.

Harrowing
and other labours.

with your Harrows, and then sow it; which done, you shall harrow it much more painfully, and not leave any clots or hard earth unbroken that the Harrow can pull in peeces: as touching the seed, which is fittest for this earth, it is the same that is spoken of in the next foregoing Chapter: as namely the best Rye, or the best Maslin, which is Rye and Wheat equally mixt together, or if there be two parts Rye and but one Wheat, the seed will be so much the more certain and sure holding; and this seed you may sow on this ground three yeares together, then barley, then Oats, and so forth, as is formerly writ of the grounds foregoing. After your ground is sown and harrowed, you shall then clot it, sleight it, and smooth it as you did the other grounds before, and then lastly with your back Harrows, that is, with a pair of harrows, the teeth turned upward from the ground, and the back of the harrow next unto the ground, you shall run over all the ground and gather from the same all the loose Grasse, Twitch, or other weeds that shall any waies be raised up, and the same so gathered you shall lay at the lands end in heaps, either to rot for manure, or else at the time of the year to be bunt for ashes, and sprinkled on the earth the next seed time.

Lastly touching the weeding of this soyl, you shall understand the weeds which are most incident thereunto, are all the same you first went about to destroy; as namely, Twitch, rough wild Grasse, & young woody undergrowth, besides thistles, Hare bottles, and Gypsie-flowers; therefore you shall have a great care at the first appearance of the Corn, to see what weeds arise with it, (for these weeds are ever fully as hasty as the corn) and as soon as you see them appear, both your self and your people with your hands shall pull them up by the roots, and so weed your land as you would weed a garden, or Woad-ground. Now if at this first weeding (which will be at the latter Spring commonly called *Michaelmas*, or the Winter Spring, (you happen to omit and let some weeds pass your hands unpulled up (which very well may chance in so great a work) you shall then the Spring next following (seeing them as high, or peradventure higher than the Corn) with your wooden nippers pull them up by the roots from the ground, and so cast them away.

As touching the cutting them up close by the ground with ordinary weed hooks, I do in no sort allow it, for these kind of weeds are so apt to grow, and also so swift in growth, that if you cut them never so close in the Spring, yet they will again over-mount the Corn before harvest, and by reason of their greatness, roughness, and much hardness, choak and slay much Corn that shall grow about them, and therefore by all meanes you shall pull these weeds up by the roots whilst they are tender (if possibly you can) or otherwise in their strongest growth, &th their sufferance breedeth great losse and destruction.

CHAP. 9:

Of the Plowing, Tilling, Ordering and Enriching of all barren Sands, which are over-run with Moors or moorish stinking long Grass.

UNto these forgoing barren Sands, of which I have already written, I will lastly joyne this last barren sand, being of all earths whether Clay or Sand, the most barren, and that is that filthy, black moorish Sand which beareth nothing but stinking, putrified Grass or Moss, or Moss & Grass mixed together, to which not any beast or cattel, how course or hardly bred soever wil at any time lay their mouths; & this kind of ground also is very much subject to marshes and quagmires, of which that which is covered with Moss, or Grass, is the worst, and that which is tufted above with rushes, the best, and soonest reduced unto goodness; in brief, all these kinds of grounds generally are extremely moist and cold, the superabundance whereof is the occasion of the infinite sterility and barrenness of the same.

And therefore he that is master of such unprofitable Earth, and would have it brought to some profit or goodness, shall first consider the situation of the ground, as whether it lye high or low: for some of these marsh grounds lye low in the Valleys, some on the sides of hills, and some on the tops of Mountaines; then whether the much moistness thereof be fed by River, Lake, or Spring, whose veines not having currant passage through, or upon the earth, spreads lookingly over all
the

the face thereof, and so rotting the mould with too much wet makes it not onely unpassable, but also utterly unprofitable for any good burthen.

Ground for
Fish-ponds.

Now if you find that this marsh Earth lye in the bottome of low valleys, as it were garded about with hills, or higher grounds, so that besides the feeding of certain Springs, Lakes, or Rivers, every showre of rain or falling of water from higher grounds bringeth to these an extraordinary moisture to maintain the rottenesse, in this case this ground is past cure for grasse or Corne, and would onely be converted and made into a fish-pond for the breeding and feeding of Fish, being a thing no lesse profitable to the Husbandman for keeping his house, and furnishing the market than the best Corn land he hath: and therefore when he maketh any such pond, he shall first raise up the head thereof in the narrowest part of the ground, and this head by driving in of stakes and piles of tough and hard wood, as Elme, Oak, and such like, and by ramming in of the earth hard between them, and sodding the same so fast that the mould can by no means be worn down or undermined with the water, he shall bring it to as firme earth as is possible, and in the midst of this head he shall place a sluice or flood-gate made of sound and clean Oak timber and plancks, through which at any time to drain the Pond when occasion shall serve: and this done, you shall digge the pond of such depth as the earth conveniently will bear, and casting the earth upon either side, you shall make the banks as large and strong as the ground requireth; then if any spring which did before feed the earth be left out of the compass of the pond (because it lyeth too high to be brought in) then shall you by drawing gutters or drains from the spring down to the pond, bring all the water of the springs into the pond, and so continually feed it with fresh and sweet water. Then storing it with Fish of best esteem, as Carpe, Tench, Breame, Peareb, and such like, & keeping it from weeds, filth & vermine, there is no doubt of the dayly profit.

But if this marsh and low ground, though it ly low and have many springs falling upon it, yet it lyeth not so extreme low but that there is some River or dry ditches bordering upon it, which lye in a little lower descent, so that except in case of inun-

inundation the river and ditches are free from the moyfture of this ground, but where there is any over-flowing of waters, there this marsh ground muft needs be drowned; in this cafe this ground can hardly be made for Corn, because every over-flow putteth the Grain in danger, yet may it be well converted to excellent paffure or meadow, by finding out the heads of the Springs, and by opening and cleansing them, and then drawing from thofe clenfed heads, narrow draines or furrows, through which the waters may pafs to the neighbour ditches, and fo be conveyed down to the lower Rivers: leaving all the reft of the ground dry, and fuffering no moiftures to pafs, but what goeth through thefe fmall deep channels: then as foon as summer commeth, and the ground begins to harden, if you fee any of the water ftand in any part of the ground, you fhall forthwith mend the Draine, and help the water to pafs away, which done (as the ground hardneth) you fhall with hacks and fpedes lay the fwarth fmoth and plaine, and as early in the year as you can conveniently, you fhall fow upon the ground good ftore of hay feeds, and if alfo you do manure it with the rotten ftaddles or bottomes of hayftacks, it will be much the better, and this ftaddle you fhall not fpread very thick, but rather of a reasonable thinnefs, that it may the fooner rot and confume upon the fame.

But if this marsh and filthy ground do not ly fo low as thefe low valleys, but rather againft the tops of hills: you fhall then firft open the heads of all the fprings you can find, and by feveral draines or fluces, draw all the water into one draine, and fo carry it away into fome neighbouring ditch and valley; and thefe draines you fhall make of a good depth, as at leaft 2 foot or 2 foot & a half, or more, if need require, and then cross-wife, every way overthwart the ground, you fhall draw more shallow furrows, all which fhall fall into the former deep draines, and fo make the ground as conftant and firme as may be: then having an intent to employ it for corne, you fhall bring your plow into the ground, being a very ftrong one, and not much differing in Timber-work or Irons from that which turneth up the clay-grounds, and laying before the plow long waddes or reules of the ftraw of Lupins, Peafe, or elfe Fetches, (but Lupins is

Draining of
wet ground.

is the best) you shall turn the furrows of earth with the plow upon the waddes and so cover or bury them in the mould, and thus do unto every furrow, or at least unto most of the furrows you turn up, and so let it lye a little time to rot, as by the space of a fortnight or three weeks, in which space, if the ground receive not raine and moysture enough to rot the straw thus formerly buried, you shall then by stopping the draincs, and making the Springs over-flow, gently wash the ground all over and no more, & then presently draine it again; which done, as soon as the earth is dry, you shall hack it and break it into small peeces, and then you shall also sand it, lime it, and manure it.

And lastly you shall marl it, but if no salt sand be to be had, then in stead of it you shall chalk it, yet of all the rest you shall take the least part of chalke.

This done, about the latter end of *July* you shall plow up the ground again with somewhat a better and deeper stich than you did before, that if any of the straw be unrotted or unconsumed, it may again be raised up with the new moyst earth, and so made to wast more speedily, and if at this second carrying you do see any great hard clots to rise, then with your hacks you shall break those hard clots in pieces, laying the Land cleane without clots, weeds, or any other annoyance, and so let it rest till *October*, at which time you shall plow it over again, hack it, harrow it, and then sow it with the best Seed-Wheat; for this soyl thus drest and manured, albeit it be of all other the most barren, yet by reason of this moysture, which at pleasure may be put to it, or taken from it, and by the mixture of these comfortable soyles and composts, it is made as good and fruitfull as any earth whatsoever, and will beare Wheat abundantly for the space of three years together, then good Barley the fourth year, with a little helpe of a Sheepfold, or Sheeps manure; then Rye the fift year; Oates the sixth, the seventh and eighth years: small Pease the ninth year; good meadow or pasture three yeares following, and then to be new drest againe, as before-said.

Harrowing.

Now as soon as your Seed-wheat is sown, you shall then harrow the ground again, and be sure to cover the wheat both deep and close: as for the clots which shall arise from this soyl, it

it shall not matter whether you break them or no, for by reason of their moisture, they will be pliant and easie for the Wheat to pass through, so that you shall not care how rough your land lye, so it lye clean, and the corn well covered, but for all other seeds you shall break the clots to dust, and lay the land as smooth as may be.

Now for the weeding of this soyle, you will not be much troubled therewith, because this ground naturally of its own accord putteth forth no weeds, more than those which are ingendred by the new made fruitfulness thereof, and those weeds for the most part are a kind of small sedge or hollow reed; any of which if you see appear, or with them any other kind of weed, you shall at the first appearance, either pul them up by the roots with your wodden nippers, or else cut them close by the ground with your weed-hooks.

Weeding.

CHAP. 10.

A generall way for the enriching of any poor arable ground, either Clay or Sand, with lesse charge then formerly.

IF the former demonstrations and instructions which I have shewed thee, appear neither too difficult, or too costly (for now I speak to the plain simple, poor Husbandman) and yet thou art master of none but barren earth, then thou shalt, by thine own industry, or the industry of thy Children, Servants, and such like; or by contracting with Taylors, botchers, or any poor people that wil deserve a penny, gather up, get or buy all the rags, shreds, odd base pieces of woollen cloth whatsoever, which are onely cast, and fit for nothing but the dung-hill, and of these if thou canst compass but a sack-ful, or a sackful & a half, it is sufficient for the dressing of an acre of arable ground. These shreds & rags (torn small) or hacket & hewed into small peeces or bits, thou shalt thinly spread over the land before fallowing time, then comming to fallow, plow them all into the ground, & be sure to cover them, then give your land the rest of it ardors, as stirring, soyling, ridging, &c. in their due seasons, and after an husbandly manner: then when you come to sow it, you shall take

Raggess of wollen cloth.

Steeping of
seed corn.

Or any pulse.

the slimie thick water which commeth from dung-hills, or for want thereof, water in which Cow dung hath been steeped, and therein you shall steep your seed corne, that is to say, if it be barley, you shall steep it for the space of thirty six hours, or thereabouts; if it be Wheat, but eighteen hours; and if it be Pease, but twelve hours; for Ry, or Oats, not at all: and the seed thus steeped, you shall sow it according to good Husbandry, and there is no doubt of wonderfull encrease.

There be others which take the seed-corn, and keeping it in good store of Cow-dung and water, stirre all together for an hour in the morning, and an hour at night, and then being settled, draine the water from the seed and the dung, and the next morning sow the corne and the dung both together on the land, being sure not to scant the Land of Seed, and no doubt the encrease will be wonderfull.

Now if this cannot be conveniently done, or that you want dung, if then you take ordinary water, and therein steep your seed, it is good also, and especially for barley, and is approved by daily experience.

Shavings of
horn.

Hoofs of cat-
tell.

But now me thinks I hear the poor man say, that here is but one acre drest, and that is a small proportion; to this I answer, if thou beest able but to dress one acre with these woollen raggs, thou shalt then search amongst the Horners, Tanners, Lanthorn makers, and such like, and get all the wast shavings of horn which thou canst possibly compass, and as before of the rags so of these a sack and a half, or two sacks will dress an acre: these shavings (which are indeed good for no other use) you shall scatter upon the land as you did the rags, then plow them in after the same manner, so order the ground, so sow, and in the same manner steep the seed, and questionless the encrease will be wonderfull great: these manures will last five years without any renewing. Now if of these you cannot get sufficient to trim all your ground, you shall then deale with Butchers, Sowse women, Slaughtert-men, Scullions, and the like; and from these you shall get all the hoofs you can, either of Oxe, Cow, Bull, Calfe, Sheep, Lambs, Deer, Goates, or any thing that cheweth the cud, and which indeed, if not for this use, are otherwise utterly cast away to the dung hill, and despised: and these hoofes

you

you shall cut and hew into small peeces, and scatter thick upon your land at fallowing time, then plow them in as aforesaid, and do in all points as with the other manures already recited, and so steep your seed, and there cannot be a greater enricher of arable ground whatsoever.

Now if all these will not yet comp off your land, you shall then see what sope ashes you can get or buy, for of all manures there is none more excellent, for besides it giveth an exceeding strength and fatnesse to the land, it also killeth all manner of weeds, great and small, as broome, Gorse, Whinnes and the like, & it killeth all manner of Worms, & venemous creeping things, it is excellent for Woad, & the ground renewed yearly therewith may be sown continually: these sope ashes must be laid on the Land after fallowing, and then stirred in, two load thereof will serve to dress an acre: when it is fit for seed, the seed must be steeped as aforesaid, and then sown, and the increase will quit the charge manifold. These sope-ashes are also excellent good for Hemp and Flax, being thinly sown upon the land, after it is plowed; and immediately before the Seed be sown: but if you have more land to dress, then you must make use of your own ordinary manure, as is Oxe dung, Horfe-dung, and the like, which that you may make richer & stronger then otherwise of its own nature it would be, you shall cause continually to be thrown upon it all your powdred beef broth, and all other salt broths or brines which shall grow or breed in your house, also all manner of soap-sudds, or other sudds, and washings which shall proceed from the Launderie, and this will so strengthen and enrich your manure, that every load shall be worth five of that which wanteth this help. There be divers other manures which do wonderfully enrich and fatten all manner of barren grounds, as namely the harie of beasts hides, (which for the most part Tanners and Glovers do cast away) this thinly spread on the Land, and plowed in, brings every year a fruitfull crop. Again if braken or Fern be layed a foot thick upon the earth, and then a layer of earth upon it, then another layer of braken, and another layer of earth, and so layer upon layer till the heap be as big as you intend it, and so left to rot all the Winter following, there cannot be a better

Of Woad.

The enriching
of ordinary
maurnc.The hairs of
beasts hides.

Of braken.

To rot dung
quickly.

manure for any arable ground; for you shall understand that the earth will so rot the braken, and the braken so soak into the earth, that they will become both one rich substance. And herein you shall note, that whensoever you would have any substance (of what condition soever) quickly to rot and turn to manure, that the onely way is to mix it with earth, and that will in short space bring it to rottenesse. Now this braken and earth thus rotted you shall lay upon your land as you do your ordinary dung of cattell, and then sow your seed being steeped as aforesaid.

Of Malt-dust.

Next your Malt-dust which is the sprout, come, smytham, and other excrements of the malt, is an excellent manure for arable land, allowing three quarters thereof for an acre, and srowing it upon the land after it is plowed and ready to be sown.

Of rotten Pil-
chers and gar-
bage.

There is another manure, which albeit it is not plentiful every where, yet in some places it is, and not inferiour to any manure before spoken of, & that is your rotten Pilchards after the oyl is taken from them, & the carcasses cast to the dung-hill; this laid on the land, & plowed in, bringeth corne in great abundance: and no lesse doth the carcasses and garbage of all kind of fish whatsoever, especially of sea-fish.

Of blood of
fals.

Lastly the blood, entralls and offall of any beast is an excellent manure for any kind of grain, plant, or tree, but especially for the Vine, for to it there is no nourishment of greater force or efficacy: also, if this blood be tempered with lime, it is exceeding comfortable for grain and destroyeth worms, and other creeping things which hurt Corne, only it must not be applied presently, but suffered for a little time to rot, lest the too much heat thereof might scorch and do hurt to the root of the corne: this manure is to be laid on the earth when you sow it, and so the seed and it harrowed or plowed in together, which done after the order of good workmanship, there is no doubt of the encrease.

CHAP. II.

How to enrich for Corn, any barren, rough, woody ground being newly stubbed up.

IF you have any barren woody ground which is newly stubbed up, and that you would convert it to arable, you shall then take a great quantity of the underwood, or worst brush-wood which was cut from the same, and in the most convenient place in the field, as in the midst, or near there about, you shall frame it into a broad hollow pile, and then cover it all over with great sods of earth, which done, set fire on it, and leave no part thereof (either wood or earth) unburnt, then take those Wood ashes. ashes and spread them all over the field, so farre forth as you mean to plow up, then with a good strong plow fallow the ground as deep as you can, and so let it rest till it be almost *May*; then take either Fern, Scubble, Straw, Heath, Furrs, Sedge, Ashes of
Eern, Straw,
&c. bean stalks or any other wast groweth, take I say either any one, or more of these or altogether, as you stand possist of them, and burn them to ashes and therewith cover your land the second time, and then in summer stirre it within a Month, after soyl it, then at the beginning of *October*, or a little before, plow it again, and sow it with *Rye* the first crop, and you shall see the increase will be very plentifull, the next year you may sow it with *Wheat*, the third year with *barley*, the fourth year with *Pease*, *Lupins*, *Fetches* or any other pulse, and then begin with *Wheat* again; for it is credibly said, that this manner of dressing these barren, woody grounds, shall maintain and keep the earth in good heart; & strength in the worst places, for the space of four years, in that which is any thing reasonable for the space of six years, and where there is any small touch of fertility, for the space of sixteen years; of which there are dayly experiences in *France* about the Forrest of *Arden*, and some with us here in *England* in many woody places.

CHAP.

CHAP. 12.

The manner of reducing and bringing unto their first perfection all sorts of ground which have been overflowed or spoiled by salt-water, or the Sea-breach, either arable or pasture, as also the enriching or bettering of the same.

The difficulty of this labour.

The vertues of Salt.

The Vices which come from Salt.

There is nothing more hard or difficult in all the art of husbandry then this point of which I am now to entreat, as namely the reducing and bringing unto their first perfection all sorts of grounds which have been overflowed or else spoiled by the Sea-breach and bringing in of too great abundance of salt water, which to some men of little experience, and free from those dangerous troubles may appear a matter very sleight, and the wound most easie and curable; and the rather, because in all my former relations and demonstrations touching the bettering of every severall sort of ground, I do apply as one of my chiefest ingredients or simples, by which to cure barrenness, Salt sand, salt weeds, salt water, salt brine, Ashes, Lime, Chalk, and many other things of salt nature, as indeed all the manures and marles whatsoever must either have a salt quality in them, or they cannot produce fruitfulness, so that to argue simply from naturall reason, If salt be the occasion of fruitfulness and increase then there cannot be much hurt done by these overflowses of the salt water, but that it should rather adde a fattening and enriching to the ground then any way to impoverish it, and make it incapable of growth or burthen. But experience (which is the best Mistresse) shewes us the contrary, and there is nothing more noysome and pestilent to the earth then the superabundance, and too great excesse of saltnesse; for according to our old Proverb of *omne nimium*, that too much of every thing is vitious, and as we see in the state of mans body that your strongest poysons, as *Antimony* or *Sibium*, *Colequintida*, *Rubarb*, and the like, taken in a moderate nature, are most healthfull, and expell of those malignant qualities which offend the body, and occasion sicknesse; but taken in the lest excesse that can be devised they then (out of their vitious and naughty qualities) do suddenly and violently destroy all health, and bring upon the body

body inevitable death, and immortality; so is it with this matter of salt, and the body of the earth; for as by the moderate distributing thereof it correcteth all barren qualities, disperseth cold, and naughty vapours and yeeldeth a kind of fatness and fruitfulness whereby the Seed is made more apt to sprout, and the ground more strong or able to cherish the same till it come to perfection, through the sharp, warm, and dispersing quality thereof; so beeing bestowed in too great abundance and excess, The abuse of salt in excess whereby the earth is surfeited, and as it were overcome and drowned up with too much of this naturall goodness, and helpfull quality, then all his proper vertues turn to egregious vices, as his wholesome sharpnesse to a fretting, gnawing and destroying greediness, his comfortable warmnesse to a consuming, and waking fieriness, and his gentleness in dispersing to an infectious and venomous pollution, by the joynt qualities of all which together, the ground is made neither fit to receive any thing from the hand of the Husbandman, nor yet to produce or bring forth any thing of it self, because every good quality is abused or expelled, and nothing but unnaturalness and sterility left; which like a Serpent lodgeth in the ground, and will suffer no good thing to have society with it: and these are the effects and mischiefs which are occasioned by these Sea-breaches or inundations of the salt water.

It is certaine that although in the salt marshes, where the Sea commeth in at certain times, and onely washeth or sprinkleth Of salt moderately used. the ground all over, and so departeth, there is neither want of grafs, nor yet complaint of any evill quality in the grafs; yet it is most certain that no overflow of salt water how little or moderate soever, can be truly said to be wholesome for any kind of grafs ground whatsoever; for grafs is compounded, of an infinite world of plants and simples, and most of them of several natures and qualities, so that if it give nourishment to one, No overflow of salt water good for grafs. yet it may destroy tenne; neither do I find it by any of the Ancients simply and properly applied unto the grafs grounds, but first unto the arable, in which having spent its primary or first strength upon the seed (which is a great and greedy devourer or cater up of the strength and fatness of the earth) it then prepares and makes the ground more able and fit to bring

The grounds
of the salt
Marshes.

A true cause
of barrenesse.

Where this
annoyance
is incurable.

Where it is
curable.

forth grass, and that of the best and finest kind: for although the Masters of the Salt-marshes find a singular and rare profit in those grounds for the feeding, breeding, fattening, and sustaining of their great Flocks of Sheep; which upon these salt grounds, they say will never rot or perish by that universall disease, yet must they not impute it to the great quantity, goodness, or any growth in the grass, but to the salt which they lick up in the grass, and to the salt quality of the grass, which is not only an Antidote or preservative against that noysome and pestilent mortality, but also a delightfull and pleasant food wherein those Cattell take more contentment than in any other thing whatsoever; so that I must necessarily rest upon this conclusion, that as but moderate washing and overflowing of Salt waters are no certain or particular great helps unto grass-grounds, especially if they be applied thereunto, and to that purpose simply at the first, without any other preparative or working by a former meanes, as by tillage, digging, delving, or the like; so the exceeding great inundations or Sea-breaches which lye long soaking and sinking into the earth must needs be a certain infallible, and almost incurable cause of barrenesse, eating, spoiling and consuming the very roots of all manner of plants, trees, and growths, by which the ground is made utterly incapable of generation or bringing forth: and therefore where these great inundations or overflowings cannot be either prevented or avoyded, but as the seasons of the year they do and must hold their courses, there I would not wish any man to bestow either his labour or his cost, for it is loss of time and loss of substance: but where it is to be prevented or avoyded by industry, or that those over-flowings or Sea-breaches come and happen by casualty or change, as either by the unnaturalness and superabundance of tides being driven in by the violence and impetuosity of outragious winds, or by any neglect or breach in the Sea-wall, or other mishaps of the like nature, which hapneth sometimes scarce once in an age, at the most not above once or twice in many years; in these cases there is most certain remedy, and the ground so spoyled and wasted, may by art and industry be again reduced and brought to the former perfection and goodness; nay, many times amended and freed

freed from many faults and sterile qualities, to which it was either naturally addicted, or else by chance and accident grew thereunto, by continuall wearying and imployment without rest, or refreshing by the artificiall meanes of wholesome manures, or other strengthenings which ought to be applyed before those faults grew into extremities.

Now touching the cure of these grounds which are thus worn out, decayed, and made barren by these Inundations of Salt water, the owner thereof is first to draw into his consideration, that as the malignity and evill quality of the earth is grown by too much fretting gnawing and wasting of the Salt, so it must be allayed and qualified by a quite contrary condition, which is freshness: the contrary then to salt water, must of necessity be fresh water, so that you are to cast about your judgement, and by the view, situation, and levell of the ground (which for the most part can have but little difficulty in it, because these grounds upon which the Sea thus breaketh, must ever be the lowest of all other, so that a true descent comming unto it, and a true ascent comming from it, there is no hardnes to convey any water-course thereunto) look how to bring a freshness which may conquer and overcome this fatnes, and that must therefore be fresh water, which by channels, ditches, furrows, sluices, and the like, you may bring from any fresh river, spring, pond, or other freshwater course (though removed some distance of miles from the place to which you would convey it) to the very place to which you desire to have it, and with this fresh water you shall wash and gently drown over so much of your spoyled ground as you shall be able reasonably to deal withall in other costs and labour for that year; and if you have plentifull store of fresh water, then having (as I said) drowned it over gently, about four inches, or half a foot deep, you shall so let it lye two or three daies, then drain away that water by the help of back ditches, or by sluices made for that purpose, which if the situation of the ground deny you, and that there is no such convenient conveyance, then you shall in the lowest part of the ground (either joyning upon some other spoiled ground, or upon the Sea-wall or bank) place a Coy, which may either cast the water into the other ground, or else over the wall

The manner
of the cure.

One contrary
helps another.

The watering
with Fresh wa-
ter.

How to draine
away the fresh
water.

How oft to
drown the
earth.

and bank into the sea; and having thus drained away the first water, you shall then open your sluices of fresh water again, and drown your ground over the second time, and do in all things as you did before, and thus according to the plentifulness of your fresh water, you shall drown your ground, or at least wash it over with fresh water twice a week before the beginning of the Spring, and if the salt water have lain long, or be but new departed, then you shall use your fresh water for some part of the Spring also.

Helps if fresh
water be want-
ing.

Whether brack-
ish water be
wholesome.

Now some may object unto me here (and it is a matter altogether unlikely) that in some of these places where these inundations and breaches are, it is impossible either to find fresh water, and to bring fresh water unto them, because all the springs for many miles about being made naturally brackish, and the rivers by the infection of the salt tides, having lost the greatest part of their sweet freshness; the question now resteth, whether these brackish waters are wholesome for this purpose, I or no? To this I must needs answer, that they cannot in any wise be good for these spoiled grounds, because the earth naturally is of an attractive and drawing condition, sucking and gathering unto it self any thing that is of a sharp, sweet, or sower tast, and especially saltness, so that being covered with those brackish waters, it will draw from them only their salt (of which it hath too much already) and no part of the freshness which should qualifie and amend it: therefore if either your ground be thus situated, or your necessities thus unsupplied, it is better that you rather forbear this labour of washing or drowning your earth (though it be the first, the speediest and surest cure of all other, than by watering it with infinite and unwholesome waters, rather encrease the mischief than any way delay it:

The first time
of plowing, &
the observati-
ons therein.

How to mixe
earths.

After you have watered your ground (if it be a work impossible to be attained unto) or otherwise neglected, it being a thing not possible to be found) you shall then about the latter end of *March* plow up all the ground with a good deep fitch, turning up a large furrow, and laying it into lands, raise them up as much as you can, and make them round; then look

of

of what nature or temper the earth is, as whether it be fine sand, rough gravell, stiff clay, or a mixt earth, or any of these contraries together; If it be a fine sand, either white, red, or brown, it matters not whether, then you shall take any clay earth which is free from these salt washings, being of a mean or small stiffeness, and likewise of as meane and little richness, which being digged out of some bank, pit, or other place where least losse is to be had, you shall carry it in tumbrels or carryages to the new plowed ground, and there first lay it in heaps as you do manure, then after spread it all over the Land, and being dry, with clotting beetles break it as small as you can possibly, for this hungry Clay being of no rich and fat condition, will so suck and draw the salt into it, that it will take away much of the evill quality, and mixing his tough quality with the loose condition of the sand, they will both together become apt for fruitfulnessse and generation.

If the soyled ground be a rough hard gravelly earth, then you shall mixe or spread upon it the best and richest fresh Clay you can get, or if there be any such fruitfulnessse near about you, then with a good blew marle, for that is the coolest and the freshest, and will the soonest draw out the salt from the gravell, and give it a new nourishment, whereby any seed shall be fed and comforted which is cast into it.

If the spoyled earth be of its own nature a stiffe and tough Clay, which is but seldome found so near the Sea shoare, then after the plowing, you shal mix it, & cover it over with the freshest and finest Sand that you can possibly get, for that will not only separate the Salt from the Clay, and take away the naturall toughness and stiffness of the same, which hindereth and suffocatheth the tender sprouts; so as they cannot easily get out of the earth, but also by lending a gentle warmth, will assuage the cold quality of the clay, and make it bring forth most abundantly.

Lastly, if the same spoyled earth be of a mixed quality, then you shall look whether it be binding or loosening, if it be binding, then you shall mix or cover it with fine fresh sand, if loosening, then with a reasonable rich and tough clay, for so you shall bring it to an open and comfortable temper, making

it able both to receive cherish and bring forth the seed; which before either too much wet, or too much driness did stifle and bind up within the clots and mould, so as it had no strength to beare himself through the same.

The second plowing.

Electiō of manures.

The best manures.

The ordering of the manure.

The third plowing.

When you have covered your lands with this mixture, you shall then plow it over again before *Midsummer*, turning the new laid earth under the old earth, and as soon as that labour is finished, you shall then lade forth your manure or compost unto it, in which you are to have a great care what manure you elect for this purpose, for it is not the richest and fattest manure as your Pigeons dung, or Pullens dung, Lime, Chalk or ashes, your Horse-dung, your shovellings up on high waies, your beasts hoves, your horn shavings, your Hemp-weed, or any other weed which groweth near the seyde of the sea, neither your Oxe or Cow-dung, though of all before named, that is the best, which doth the most good upon these spoyled grounds, because they have all in them a strong quality of saltness or sharpness, which will rather adde than diminish the evill quality of the earth, but instead of these you shall take the mud of dried bottomes of Lakes, Ponds, and Ditches of fresh water, and the moyster or wetter such mud or bottomes are, the better it is, or Straw which is rotted by some fresh water course, raine, or the like; by no means that which is rotted by the urine or stale of horse or cattell, for that is the saltest of all other; or you may take any weeds which you see grow in fresh Rivers, Ditches, Ponds, or Lakes, especially those which grow at the bottomes of Willow, Sallow, or Osier trees, or you may take the old raggs of woollen cloth, or any other manure which you know to be the woolest or freshest, and with any of these, or all of these together, you shall very plentifully cover your ground all over, and immediately upon the covering or laying on, see you presently plow it, land after land; for to give it any long respite after it is spread, the Sun out of his attractive and strong nature will exhale and draw out all the vertue from your manure, and so spoyle much of your labour.

When you have thus manured it, and plowed it, you may then let it rest till *Michaelmas*, at which time you may plow it the last time, and then sow it with the strongest and hardest
Wheat

wheat you have, of which the white Pollard is the best, & there is no question but if it be safe from a second Inundation, your crop wil both be plentiful & rich, and also acquit and pay largely for all your former charges. The second year you need but only plow it as aforesaid; and then sow it with good Hemp-seed, and be assured you will have a brave crop arise thereof; then the third year you shall plow it as flat as you can, still throwing it down and not raising it up at all, and then sow it with the best Oates you can get, according to the nature and strength of your Countrey, and be sure to harrrow it well, and to break every clot, and make the mould as fine as is possible, and the next year after your Oates, lay it for grasse, and I dare be bold, it will bear reasonable meadow; yet would I not have you this year to preserve it for that purpose; but rather to graze it with Sheep or Cattell, especially Sheep, of which would have you lay on good store; for it matters not how near or close to the ground they eat it; for the next year it will be come to the fulness of perfection, and be as profitable or more profitable ground than ever it was, and then you may apply or accommodate it for what use you please, either arable, Meadow, or for continuall grazing.

The second
year sowing
and third.

Laying the
earth for grasse

And thus much touching the manner of reducing again, and bringing unto their first perfection, all sorts of grounds which have been over-flowed or spoiled by Salt-water, or the Sea-breaches, whether it be arable or pasture; as also the enriching or bettering of the same.

Of grazing.

CHAP. 13.

Another way to enrich barren Pastures, or Meadows, without the help of water.

IF your barren Pastures or Meadows be so seated that there is no possible means of washing or drowning them with water, you are then only to restore and strengthen them by the efficacy of manure or soyl, without any other help, and this may diverse wayes be done, as by those manner of manurings which I have formerly treated of. But to go a better and briefer way to work, and more for the ease and capacity of the plaine Husbandman

bandman, whensoever you shall be posselt of these barren pastures, if the barrenesse proceed from sand, or gravell, then some Husbands use to manure the pasture over with the best clay they can get, first laying it in heaps, then spreading it, and lastly with clotting beetles breaking it into as fine dust as they can get it, and this labour they commonly performe as soon as they can after Harvest, when the latter spring is eaten and the earth is most bare, but if the barrenness proceed from an hungry, cold & dry clay, then the manure is with the best moorish black earth which they can get, or with any moyst manure whatsoever, especially and above the rest when the soyle that is digged out of old ditches, ponds, or dried up standing lakes, and this earth must be laid plentifully upon the ground in manure heaps, as aforesaid, that is to say first in great heaps, then after broken and disperfed over the whole ground, and lastly broken into small dust, and mixed with the swarth of the ground, and this labour as the other generally performed after the Harvest as a time of most convenience, and giving the earth a fit respite to suck in the strength and comfort of the new earth, and also having all the Winter after with his frosts, snowes, and showers, to mellow, ripen and mixe together the one earth with the other, and doubtless this is a most exceeding good Husbandry, and not to be refeld or carpt against by any knowing or sound judgement; onely it is not the most absolute, or best of all waies whatsoever, but that others may be found some what more near, and somewhat more commodious.

The best way
to enrich pasture
or meadow.

The soyl of
the streets or
high-waies.

Therefore whensoever you shall be owner of any of these barren pastures, or meadows, of what nature or condition soever the earth be, whether proceeding from gravell sand, clay, or pestered with any other malignant quality whatsoever, to reduce it to fertility and goodnes in the shortest time, and to the most profit, about the Month of *March*, when all pasture grounds are at the barest, and do as it were remain at a stand between decreasing and increasing, you shall begin then to lead forth your manure for the refreshing of these Earths, and the manure which you shall carry unto these grounds, shall be the soyl of streets within Cities or Towns, or the parings and gatherings up of the high-waies much beaten with travell, also the earth
for

for two or three foot deep, which lieth under your dung-hill when the dung is removed, and carryed away, for this is most precious and rich mould, and is not alone excellent for this use, but also for the use of Gardens, for the strengthening and comforting of all sorts of tender plants, and for the use of Orchards, for the comforting both of old and young Trees, when at any time their Roots are bared, or otherwise when there groweth any mislike or decreasing.

Earth under
Dung-hills.

To enrich gar-
dens or or-
chards.

You shall also take the fine earth or mould which is found in the hollow of old willow trees, rising from the root up almost to the middle of the tree, at least so far as the tree is hollow, for then this there is no earth or mould finer or richer.

The mould of
willow in tree.

Of all these manures, or of any one of them, or of as many as you can conveniently get, you shall lead forth so much as may very plentifully manure and cover your ground all over; you shall first lay it on the earth in reasonable big heaps that the Sun may not exhale the goodness out of it, & then at your best leisure, and so soon as you can conveniently you shall spread it universally over the field, dispersing it as equally as you can, unless your field be more barren in one place then in another, which if it be, then you shall lay the greatest plenty where it is most barren, and the less where you find the greatest fertility; yet by all means see you scant not any place, but give every one his due; for to do otherwise would shew much ill husbandry.

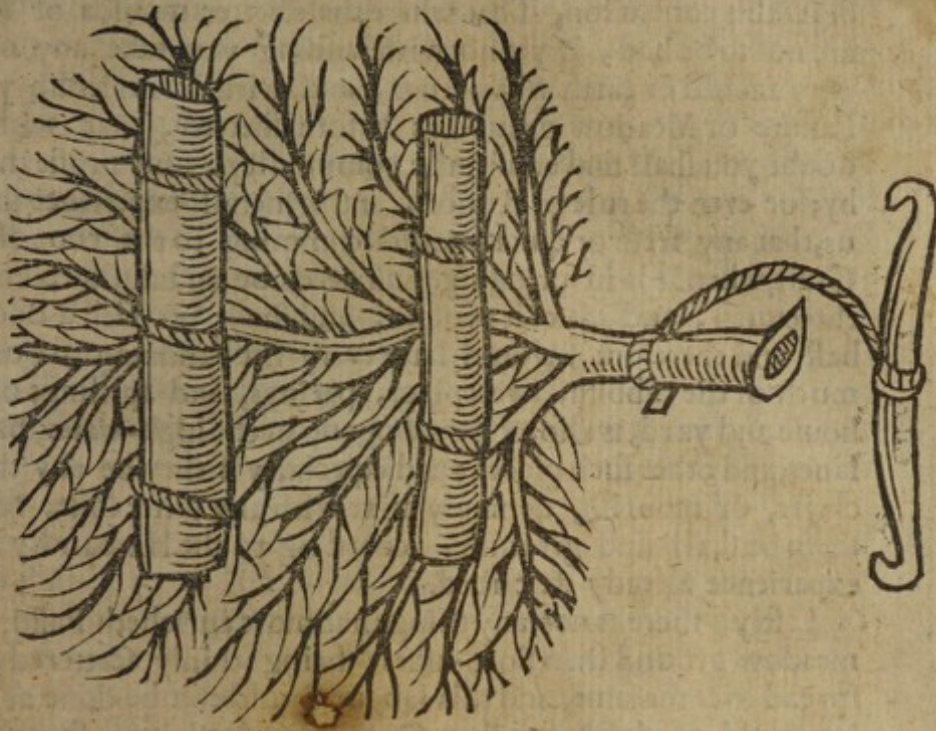
Now it is the use of some Husband-men, that what mould or earth laid out from fixe a clock in the morning till three of clock in the after noon, that they make their Hinds spread in the evening before they go to supper, and questionless it is a very good course, and worthy to be imitated of every good Husband:

After you have laid forth your mould, and spread it all over your pasture or meadow, then you shall make some boyes, girles or other people, to pick and gather up all the stones, sticks, or other unnecessary matter which might happen to be led forth with the mould, and to pick and lay the pasture so clean as is possible, which done it is to be intended that yet notwithstanding this ground will lye exceeding rough, both in respect of the clotts of earth, which will not easily be broken, as also in re-

spect of naturall roughness of these rich moulds which at this time being digged up in the wet will not easily be separated or dissolved, and therefore when you have finished the labours before said, you shall let the clots rest till the Sun, and weather have dried them, then after a good ground showre (observing to take the first that falleth) you shall harrow your ground over after this manner.

A new way of Harrowing.

You shall cut down a pretty big white thorne-tree, which we call the Hawthorn tree, and make sure that it be wonderfull thick bushie and rough grown; which done, you shall plash it as flat as as you can, and spread it as broad as you can, and those branches or boughs which of necessity you must cut in sunder, you shall again plash and thrust into the body of the Tree, binding them with cords or withs so fast thereto, that they may by no means scatter or shake out, and if any place appear hollow or thin and cannot come to lye hard, firme, and rough upon the ground, then you shall take other rough bushes and thrust into the hollow places, and bind them from stirring also, till you have made your plash full and equall in all places, and that all the roughness may as in a flat levell equally touch the ground: when you have thus proportioned your Harrow, you shall then take great logges of wood or peeces of timber: and with ropes bind them on the upper side of this rough Harrow, that the poise or weight of them may keep the rough side hard, and firm to the earth, and then the Harrow will carry this proportion or figure.



To the big end of this harrow, you shall fixe a strong rope with a Swingle-tree with Treats, Coller, and Harnesse, and one Horse is fully sufficient to draw it round about the Pasture or Meadow, so with this Harrow you shall harrow the ground all over, and it will not onely break all the hard clots to a very fine dust, but also disperse them and drive them into the ground, and give such a comfort to the tender roots of the young grafs, then newly springing, that it will double and treble the increase. And for mine own part, this experience I my self have seen upon an extreme barren Pasture ground in *Middlesex*, where none of these good moulds or soyles could be got, but the Husband was fain to take all the rubbish and course earth even to the very sweepings of his yard, and for want of enough thereof, to take any ordinary earth he could get and with it he drest the ground in such sort as I have now last shewed you, and this being done in *Aprill*, he had in *June* following as good Meadow as could bee wisht for, and was the first Meadow I saw cut downe in all that Country: from whence I

Of rubbish and sweepings.

draw this concluston, That where these better moulds or soyls are not to be had, it yet notwithstanding you take any ordinary mould or earth whatsoever, and with it replenish your Pasture or Meadow ground as before shewed, that without doubt you shall find an infinite commodity, and profit thereby; for even the rule of Reason, and generall experience shews us, that any fresh or quick mould comming to the root of the Grasse, when it is in springing, must needs be an infinite comfort thereunto, and make it prosper, and shoot up with a double hast; and therefore I would have every Husbandman to make much of the rubbish, sweepings, parings, and spidlings of his house and yard, as also of shovelings up of the high-waies, back-lanes, and other such places; and especially if they be any thing clayie, or moorish, or sandy mixt with any other soile; for of them he shall find great use, according to the Husbandry and experience already described.

Of Soape-
ashes.

Lastly, there is not any thing that more enricheth Pasture or meadow ground than Soap-ashes, being thinly scattered and spread over the same, and this labour would ever be done at the latter end of *Aprill*, for then Grasse is beginning to shoot up, and at that time finding a comfort, the increase will multiply exceedingly.

CHAP. 14.

*How to enrich and make the most barren soyle to bear
excellent good Pasture or Meadow.*

Two waies to
enrich earth.

TO speak then of the bettering and enriching of these barren earths, and reducing them to good Pasture or Meadow, it is to be understood, that there are but two certain waies to compass and effect the same, namely water or manure.

You are then when you go about this profitable labour to consider the situation of the earth you would convert to Pasture and to elect for this purpose the best of this worst earth you can find, and that which lyes lowest, or else that which is so descending as that the bottome thereof may stretch to the lowest part of the continent, for the lower that such grounds lye, the sooner they are made good, and brought to profit: Next you shall consider

sider what burthen or grasse it beares, and whether the grasse be clean and intire of it self (which is the best and likeliest soile to be made fruitfull) or else mixt with other worser growths, as Thistle, Heath, Broome, or such like, and if it be burthened with any of these naughty weeds, you shall first destroy them by stubbing them up by the roots, and by burning the upper swarth of the earth with dry straw mixt with the Weeds which you shall cut from the same, then it shall be good for certaine nights both before the first and latter Spring to fold your Sheep upon this ground, and that not in a scant manner, but very plentifull, so as the dung of them may cover over all the earth, & their feet trampling upon the ground, may not only beat in the dung, but also beat off all the swarth from the earth, that where the Fold goath, there little or no grasse may bee perceived; then whilest the ground is soft and thus trampled, you shall sow it all over with Hayseeds, and then with your flat board beetles beat the ground smooth and plain, which done, you shall then strow, or thinly cover the ground with the rotten stadds of Hay-stacks, and the moyst bottomes of Hay-barnes, and over that you shall spread other strong manure, of which Horse-dung, or horse-dung and mans ordure mixt together is the best, or for want of such, either the manure of Oxen, Kine, or other beasts; and this manure also you shall spread very thin upon the ground, and so let it lye till the Grasse come up through the same, which Grasse you shall by no meanes graze or feed with your cattell, but being come to the perfectness of growth, you shall mow it down; and although it will be the first year but short and very course, yett it skilleth not, for the ensuing years shall it yeild profit, and bring forth both so good grasse, and such plenty thereof as reasonably you can require; for this is but the first making of your ground, & alteration of the nature thereof: neither shall you thus dress your ground every year, but once in twenty or forty years, having plenty of water to relieve it. When therefore you have thus at first onely prepared your ground by destroying the barren growth thereof, and by manuring, sowing, and dressing it, you shall then carefully search about the highest parts of the ground, and the highest parts of all other grounds, any way neighbouring round
.. M 3 about

Of watering
Ground.

about it, and somewhat above the levell thereof, to see if you can find any Springs in the same, (as doubtless you cannot chuse but do, except the ground be of more then strange nature,) & the heads of all such Springs as you shall find, you shall by gutters and channels draw into those ditches which shall compass your meadow round about, observing ever to bring the water into that part of the meadow ditch which ever lyeth highest, and so let it have a currant passage through the ditches down to the lower part thereof, and so into some Lake, Brooke, or other channell, and in this sort you may bring your water a mile or two: Nay I have seen water brought for this purpose, three or four miles, and the gaine thereof hath quit the charge in very plentifull manner.

Helps in the
watering.

But if you cannot find any Springs at all, nor can have the help of any Lake, Brook, River, or other Channell of moving water, (which is a doubt too curious, as being cast beyond the Moon) you shall then not only cast ditches about this your Meadow ground, but also about all other grounds, w^{ch} shall lye about and that in such sort, that they all may have no passage but into the upper part of the meadow ditch, so that what raine soever shall fall from the Skie upon those earths, it shall be received into those ditches, and by them conveyed into the meadow ditch: and to augment the store of this water, you shall also in sundry parts of those upper grounds which are above the meadow, in places most convenient, digge large Ponds or Pits, which both of themselves may breed, and also receive all such water as shall fall neer about them, and these Ponds or Pits being filled (as in the Winter time necessarily they must needs be at every glut of raine (you shall presently by small draines, made for that purpose, let the water out from them into the ditches, and so into the meadow ditch, and so stopping all the draines againe, make the Ponds or Pits capable to receive more water.

When and
how to water.

When you have thus made your ground rich with water, and that you see it flow (as in the Winter-time necessarily it must) in plentifull manner through all your ditches, you shall then twice or thrice in the year, or oftner, as you shall then think meet in the most convenientest places of the meadow ditch, stop

stop the same, and make the water to rise above his bounds, and to over-flow and cover your meadow-ground all over, and if it be a flat leuell ground, if you let the water thus covering it to lye upon the same the space of four or five dayes, or a week, it shall not be amiss; and then you may water it the seldomer. But if it lye against the side of a hill, so that the water cannot rest upon the same, then you shall wash it all over, leaving no part unmoystned; and this you shall do the ofner, according as the weather shall fall out, and your water grow more or les plentifull.

Now for the best season or time of the year for this watering of meadows you shall understand, that from *Alhalowide*, which is the beginning of *November* (and at which time all after growth of meadows are fully eaten, and cattell for the most part are taken up into the house) untill the end of *Aprill* (at the which time grass beginneth to spring and arise from the ground) you may water all your meadows at your pleasure without danger, if you have water enough at your pleasure, and may spend or spare at your will; yet to do it in the best perfection, and whereby your ground may receive the greatest benefit; you shall understand, that the only time for the watering of your meadows, is immediately after any great Fluxe of raine, falling in the Winter, any time before *May*, when the water is most muddy, foul, and troubled, for then it carrieth with it a soyl or compost which being left upon the ground, wonderfully enricheth it, and makes it fruitfull beyond expectation, as daily is seen in those hard Countries where almost no grass grows but by this industry: And here you must observe, that as you thus water one ground, so you may water many, having ever respect to begin with the highest, & so let the water pass out of one ground into another untill it come unto the lowest, which commonly is ever the most flat and leuell, & there you may let the water remain so long as you think good (as was before shewed) & then let it out to other wast ditches or rivers. And here you shall know, that this lowest ground will ever be the most fruitfull, as well because it lyeth the warmest moystest and safest from storms and tempests, as also because what soyl or other goodnes this overflow of water, or the raine washeth from other grounds, it leaveth

The best season for watering.

leaveth upon this, and so daily encrease the fertility, from whence you shall gather, that at the first making of these meadow grounds you may bestow less cost of manure and other charges upon this lowest, flat, levell ground, than on the higher: and so by that rule also observe to bestow on the highest ground, and the highest part of the highest ground ever the greatest abundance of manure, and so as you shall descend lower and lower to lay your manure thinner and thinner, yet not any part utterly unfurnished and void of compost, yet as before I said you are to remember that these meadow grounds need not thus much use of manure (having this benefit of water, and the first years dressing as was shewed in the beginning of this Chapter) above once in twenty years; nay it may be not above once in a mans life time.

And here also is to be considered, that the water which commeth from Clay or Marl grounds, being thicke muddy and pudly, is much better and richer than that which commeth from sand, gravell, or pibble, and so runneth clear and smooth, for that rather doth wash away and consume the goodnes of the ground, than any way adde strength thereunto.

CHAP. 15.

Of the intriching and dressing of barren grounds, for the use of Hemp or Flax.

Grounds ill for
Hempe or flax

YOU shall understand there are two sorts of grounds which out of their own natures utterly refuse to bear Hemp or Flax; that is, the rich stiff black Clay, of tough solid and fast mould, whose extreme fertility and fatnesse giveth such a surcharge to the increale of the seed, that either with the ranknes it runneth all into Bun and no rind; or else the seed being tender, and the mould sad and heavy, it burieth it so deep therein, that it can by no means get out of the same. The other is the most vild and extreme barren ground, which by reason of the climat wherein it lies, is so exceedingly sterile and unfruitfull; hat it will neither bear these seeds, nor any other good seed; and of these two soils onely I purpose in this place to treat; for with such soils as will naturally & commodiously bear these seeds, I have nothing to do, in that I have sufficienty

sufficiently written of them in mine *English Husbandman* and *English Housewife*, which are Bookes onely for good grounds, but this for all such grounds as are utterly held without cure.

To begin then with the stiff black Clay, which albeit it be very rich for Corne, is most poor for these seeds, when you would reduce and bring it to bear Hemp or Flax, which neere unto the Sea-coast, is of greater price and commodity than Corn any way can be, especially adjoyning unto any place of fishing, in respect of Nets and other Engines which is to be made of the same, and which being daily wasted and consumed, must likewise be daily replenished: You must first with a strong plow, fit for the nature of such land, plow up so much ground as you intend to sow Hemp or Flaxe upon, about the midst of *May*, if the weather be seasonable, and the ground not too hard: if otherwise, you must stay till a showre do fall, and that the earth be moistned, then shall you hack it and break the clots in small pieces, then with the salt Sea-sand, you shall sand it very plentifully, but if that be not to be gotten, and that you be very well assured of the naturall richnes of the earth, you shall then sand it with the best red sand you can get or finde neer unto you, and upon every Acre of ground you thus sand with fresh sand, you shall sow three bushels of Bay salt, and then plow up again the earth, sand and salt together, which would be done about the latter end of the year, as after Michaelmas, and so let the ground rest, till seed-time, at which time you shall first before you plow it, go down to the low rocks on which the Sea beats, and from thence with drags and other Engines, gather those broad leaved blacke weeds, which are called Orowood and grow in great tufts and abundance about the shoar, and these weeds you shall bring to your Hemp-land, and cover it all over with same, and then you shall plow it againe, burying the weeds within the earth.

And herein is to be observed, that in any wise you must lay these weeds as wet upon the land as when you bring them out of the Sea, provided still, that you adde no other wet unto them but the salt water, for so they are of all soyles and manures whatsoever the onely best and fruitfulest, and most especially for these seeds, and breed an increase beyond expectation.

N

When

When you have thus plowed over the ground, you shall then hack it againe, and then sowe it with either Hemptee or Flaxseed, which you please, and after it is so sowne, you shall then harrow it (and not before) and you shall be carefull to harrow it into as fine mould as you can, and this mould is likely to runne fine enough, as well by reason of the fertility, as also of the mixture; yet what clots you cannot breake with your Harrows, those you shall breake with your clotting-beetle, and such like tooles: then after the first great shower which shall fall after your sowing, you shall runne over your land thus sowne with your backe Harrowes, that is with a paire of large Harrowes, the wrong side turned upward, to wit, the teeth turned from the earth, and the backe towards the earth; and if neede be, you shall lay upon the Harrowes some indifferent heavie piece of wood, which may keepe the backe of the Harrowes closer to the ground, and so go over all the earth, and lay it as smooth and light as is possible, without leaving the smallest clot that may be unbroken. Now if the ground be sowne with Hemptee, you shall not thinke of weeding it at all, because Hemptee is so swift a grower, and such a poyson unto all weeds, that it over-runne, choketh, and destroyeth them; but if it be sowne with Flax or Line, which is a much tenderer seede, and bringeth forth more tender leaves and branches, then you shall watch what weeds you see spring up, and in their first growth plucke them up and cast them away, till you behold your Flax or Line to be growne above the weeds, and then you may let it alone also, for after it hath once gotten height, it will not be over-growne with weeds.

Making of ill
earth beare,
&c.

Now touching the other soyle, which through the extreame barrenesse thereof, refusing to bring forth any good fruit at all; you shall in all points dresse it as you dresse your plaine clayes described in the second Chapter of this Booke, beginning at the same time of the yeere that is then appointed, or (if more necessary occasions hold you) if you beginne later, it shall not be a misse, and then at *Michalmas* you shall plow it over the second time, and manure it with sea weedes, and so let it lie at rest till *March* (which is seed-time) and then plow it againe, and manure it with sea-weedes againe, and after the plowing, you shall
hacke

hacke it, and if in the hacking you finde the earth stiffe and tough, then you shall harrow it before you sow it, and harrow it againe, breaking the earth so small, and laying it so smooth as possible you can, using the helpe both of the clotting beetles, and all other tooles which may be availeable for breaking the earth, and making the mould as fine as any ashes, then after the first great shower of raine, perceiving the ground to be well moystned, you shall instead of the backe Harrowes (which upon this earth may be too light) take the great rowler which is described in the book of the *English Husbandman*, being a great round piece of timber of many squares, drawne either by Horse or Oxen, but a single Horse is best, both in respect of much treading the ground, as also for the swife going away or drawing of the same: for the swifter it is drawne, the better it breaketh the ground, and the lighter it leaveth the mould: and with this rouler you shall runne ouer and smooth your ground very well, leaving noe clot unbroken, and so let it rest.

Weeding.

As for the weeding of this ground, you shall not respect it at all, for naturally it will put up no weede, the very ground of it selfe being a very great enemy thereunto, nor shall you need to dresse this ground in the forme before said, above once in eight or ten yeares: onely every seed time when you plow it (as you shall not need to plow it at any time, but seed-time onely) you shall before the plowing, cover or manure the Land with the sea weed before spoken of, which will give strength enough to the ground, without any other assistance.

CHAP. 16.

The manner of stacking of all Kind of graine or pulse with greatest safety, and least losse.

IN these barren and hard Countries, of which I have formerly written, all sorts of buildings are exceeding costly and scarce, both in respect of the clime, which is comonly most extreame cold, mountanous, and much subiect to storme and tempest, as also through the great want of wood and Timber, which in those hard soyles doth hardly or never prosper; and therefore in such places buildings must be both small and deare, so that it will be very hard for the Husbandman to have house-roume for

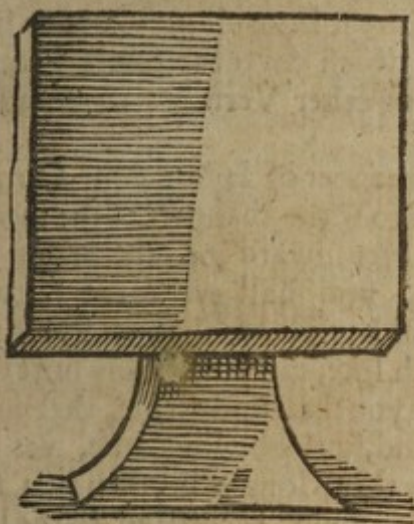
his corne, but that of necessity he must be enforced to stack much, or the most part of his Corne without doores; which albeit it be a thing very usuall in this Kingdome, yet is it in many places so intufficiently done, that the losse which redounds thereby (partly by the moysture of the ground, which commonly doth rot and spoyle at least a yard thicknesse of the bottome of the Stack next the ground, and partly through Mice, Rats, and other Vermine, which breeding in the Stack, do eat and devour a great part thereof; as also through many such like negligent causes) is greater then a good Husband may with his credit be guilty of, or a profitable Husband will by any meanes suffer to be lost so negligently.

To shew then the maner how to stack or mow your corne without doores, in such sort, as neither the ground shall rot it; nor these vermines destroy it, nor any other losse come to it by way of ill Husbandry, you shall first cause foure peeces of timber, or foure stones, to be hewed broad and round at the nether end; like the fashion of a Sugar-loafe, or this figure.

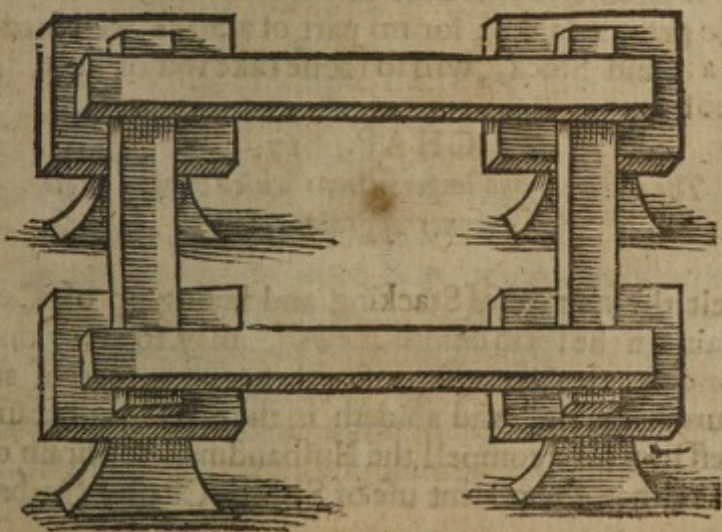


And these peeces of wood or stone shall be in length three-foot or thereabout, and in compasse or bredth at the bottome, two foot, or a foote and a halfe, and at the top not above one foot: these foure peeces of wood or stone you shall place in your stack-yard, or other convenient place neere your thrashing-floore,

floore, and you shall place them foure square, of an equall distance one from another : then you shall cut out foure smooth boards of two inches and a halfe thick at the least, and full three foot square every way, and these boards you shall lay upon the heads or narrow tops of these stones or peeces of timber, according to this Figure.



Then shall you take strong over-lyers of wood, and lay them foure square from one board to another, according to this Figure.



And then upon those over-lyers you shall lay other smaller poles close one by another, and then upon them you shall mow or stack all your Corne, whether it be Wheat Barley, Oates, Pease, or any other kind of grain, and be sure if you make your stack handsome and upright, which consisteth in the Art and Workmanship of the Workman, you shall never receive losse in your Corn, for the raising of it thus two or three foot from the ground will preserve it from all moysture or hurt thereof, and the broad boards which cover the fowre ground posts will not suffer any Mice or other Vermine to ascend or come into the same.

Now for the manner of laying your Corne into the Stack, you shall be sure to turne that part of the sheafe where the eares of the Corne lye ever inward into the Stack, & the other which is the straw end, you shall ever turne outward, and by that means you shall be assured that no flying fowle, as pigeons Crowes, and such like, can do you any hurt or annoyance upon the same: Lastly you shall understand, that you may make these Stacks either round, square or long wise, yet round is the safest, & if you do make them long-wise, then you shall set them upon six ground posts, or eight, according to the length and proportion you would have it, and after your Stack is made, you shall then thatch it very well to keep out the wet; also if when you do Stack your wheat, you do top your Stack with Oates or other course Graine, it will be so much the better, and the Wheat will lye in greater safety: for no part of a Stack well made, especially a round Stack, will so soone take wet or hurt, as the top thereof.

CHAP. 17.

The diseases and imperfections which happen to all manner of graine.

Albeit the manner of Stacking and laying up of Corn & Graine in the form before shewed, may to every one give an assurance for the safe and profitable keeping thereof as long as it indureth therein, and abideth in the eare, yet because divers necessities may compell the Husbandman to thrash out his Corne, as either, for present use of Straw, Chaffe, Garbage, or other

other commodities needfull unto him (as the season of the year shall fall out) I think it most necessary in this place to shew how all manner of Grain & Pulse, of what nature soever, may most safely & profitably be kept from all manner of annoyances, or corruptions whatsoever, being a worke of that utility & goodnesse, that not any belonging to the Husband-man doth exceed it: Nor shall it be sufficient to shew the offences and diseases of Graine, with their cures and healthfull preservations, whilest it is in the Hubsand-mans possession, but also whilest it is in the earth, and at the mercy of cold, heat, moistnesse or drienesse, and not only subject to the malignant influences of Starres and Planets, with the increasing and decreasing of the moone and her operations: but also of divers other hurtfull Vermins; as birds, wormes, Pismires, dorres, snailes, moales, and other such like: some whereof consume and devour the Graine ere it sprout, others in sprouting when the kernell is rotten, and turned to sweet substance, and others after it is sprouted, by devouring the first tender leaves, before they have any strength to appear above the earth, being as it were but soft white threds, not changed into the strength of green, because the aire and Sunne hath not yet lookt tpon it.

To begin then with the first enemies of corne or graine, after it is throwne into the earth, there is none more noysome then *Crowes*, and *Choughes*, and other smaller birds, which flocking after the seeds man, will in a manner devoure and gather up the graine as fast as it is sowne; for as according to the old saying, *That many hands makes light work*, so many of their mouthes (being creatures that ever fly in flocks together) and their much nimblenesse in devouring, soone rob the earth of her store, and deprive the labouring Husbandman of very much profit, and the Graine which these creatures doe most consume, is all manner of white corne, as wheate of all kinde, Rye and Oates, also Hempe-seede, Lin-seede, Rape-seede, and such like: Neither are they onely offensive during this time of sowing, but after it is sowne and covered, digging it with their strong bills out of the earth, and so making the waste greater and greater.

The prevention or cure of this evill, is divers, as the affecti- The Cure.
ons of people, and custome Countreyes do instruct them: for
some

some (especially the *French men*) use when they sow these grains and seeds, first to sprinkle it with the dregs or lees of their bitterest oyles, which when these devouring fowles do tast, they refuse to do any further hurt: others use to sow Pigeons dung or Lime with their seede, which sticking unto the graine, the unfavorinesse thereof will make the fowle cast up the graine againe, and leave to do further hurt. But forasmuch as these medicines cannot ever be had, nor are ever wholesome for every ground, the only best and safest meanes to prevent this evill, is to have ever some young boy with bow and arrowes to follow the seeds-man and Harrowes, making a great noise and acclamation, and shooting his arrowes where he shall see these devourers light, not ceasing, but chasing them from the land, and not suffering them at any time to light upon the same; and these servants are called Field-keepers, or Crow keepers, being of no lesse use and profit (for the time) then any other servant whatsoever. Nor is it sufficient to have the Field-keepers for the bare time of seede only, whilest the graine is in sowing, but he shall also maintaine them untill such time as you see the graine appear above the earth, which for Wheat or Rye, because they are winter seeds, and so longer in sprouting, will ask a full month; for all other seeds which are sowne in the Spring or Summer, a fortnight is full sufficient: and this Field keeper shall not fail to be in the field an houre before Sun in the morning, and so continue till halfe an houre after Sun-set in the evening, for at the rising and setting of the Sun is ever done the greatest mischeif, for then are all creatures most eager and hungry: and though the indurance may promise much paine and trouble, yet questionlesse the labour to any free-spirit, is both easie, and pleasant.

Additions.

Also if your Field-keeper, instead of his bow and arrowes, do use to shoot off a musket, or Harquebush, the report thereof will appeare more terrible to these enemies of corne, and the profit thereof will be a great deale more: for a shot or two of powder will save more corn, then a weekes whooping and shouting; onely you must observe, that your field-keeper use no bullet or haile-shot, for so he may turne scaring to killing. Now touching the destruction which these creatures make of Corn after it

is stackt up; by tearing off the thatch, and digging holes and pits therein; to prevent that, you shall cause the thatcher to scatter upon the thatch, great store of ashes of any kind, or else Lime, that as the Pigeons or Crowes teare up the straw, the Lime or ashes will sparkle into their eyes and nares, which they will not indure: as for those parts of the stack, which cannot be thatcht, as the sides and ends; upon them you shall prick divers scare-crowes, as dead crowes, or dead Pigeons, or any other rags, or the shape of a man, made either of thumbe ropes of hay or straw, or else some old cast-away apparell, stopt with straw, & so fixed on the stacke; also in this case you may use Clap mills, or such like toys, which make a great noise; But to conclude the best prevention for these creatures (if you want ability to maintain a field-keeper) is to take longe lines of pack-thread, and in them to knit divers feathers of divers colors, especially white ones, and with litle stakes so fasten them over the Corn, that with every breath of wind the feathers may dance and turne about, and the nearer that these Blinks or scares come to the ground (when the Corne is new sowne) so much the better it is, least the fowle finding a way to creepe under them, begin not to respect them; so that a hand or two from the ground is sufficient, Provided that the feathers and scares have libertie to play and move.

But if it be to save corn in the ripening, that is to say a little before it be reapt, when the eare begins to harden, or when it lieth in single sheaf upon the land, for then fowl and birds do as great mischeife, as at any other season, it shall then be fit that you raise these lines or scares upon higher stakes, so as they may play as much above the eares of Corne, as before they did above the earth: and among these scares thus made upon lines in sundry parts of the field, you shall upon other stakes place many other bigger scares, as dead Crowes, Pies, gleads, Pigeons, or such like, as also the proportion of a man formerly shewed you, or any rags of cloth being black, fowl, and ugly, like bakers malkins; and then this, there is no safer way for the defence of grain, or corne, from these birds, and such like.

Of Pismires.

The next great devourers or consumers of graine are Pismires or Ants, which although it be but a little creature, yet it is so labourfome, that the grain which they carry away or destroy by eating, amounteth to a great quantity, and the mischief which
 O these

these little vermines do, after the Corn is covered in the ground, and before it sprout, for they creeping in at the little chinkes of the earth, and finding the Corn, either drag it out, or eat it, so that it cannot grow, and the graine which they most hurt, is all manner of white corn, especially your finest and smallest wheat, for the skin or hull is thinnest, and the kernell whitest and sweetest: also to barley they do much hurt especially that which is fullest and best; likewise to Rye, Hemp-seede, Lin-seede, & Rape-seede; as for Oats, because it is double hull'd, and also your great whole straw wheat, & polard wheat, which is thick huld, their hurt is not so much to them, and unto pulse nothing at all, because they are too heavy, too thick skinned, and too bitter in taste.

The Cure.

The best cure and prevention for these Pismires is to search your corn fields well, especially under hedges and old trees, & on the top of mole hills, and if you find any beds or hills of Ants or Pismires, presently after sun setting, with hot scalding water to drown the beds or hills, or with wet straw and fire, to make such a smoak upon them, as may smother them to death: also if you manure your corne lands with ashes, lime or salt sand, you shall be well assured it will never breed Pismires.

Of Dores.

Next unto these, your Dores or great black Clocks are vehement destroyers of all kind of Corn, both white Corn and Pulse, whilst it lyeth dry on the earth, and before it sprout, for after it beginneth to rot, they do no more touch it, and these Dores destroy it in the same manner, as the Pismires do, by creeping in at the small crevices of the earth, and finding the grain, do as long as it is dry feed thereon, and though they are no hoarders, or gatherers together of the grain, keeping it in heaps in dry places as the pismires and other vermine do, yet they are great feeders thereon, and that continually; besides they will ever chuse out the fullest and best corn, & leave the leaner, whereby they do the Husbandman double injury, as first to devour, and then to devoure but the best only.

The Cure.

The cure or prevention for these Dores, or black Clockes, is in seed-time to make great smoakes in your Corn-fields, which will presently chase them from thence, for they are the greatest enemies that may be to all manner of smoak: but if that be not
sufficient

sufficient, then immediatly before you sow your Corn, you shall very lightly sow your land with sharp Lime, and whensoever the Dore shall find the smell or tast therof, presently he will depart; or if he eat of the graine that toucheth the Lime, it is as Present poyson unto him, and there he dyeth.

After these, your field Rats and Mice are very vehement destroy-
 Of field Rats
 ers of all manner of grain or Seeds befor they sprout, especially and Mice.
 all sorts of wheat, and all sorts of pulse, because for the most part those kind of graines in many soyles are sowne under furrow, and not harrowed, so that the furrows at first lying a little hollow, these Vermines getting in between the earth and them, will not only devour and eat a great part of the grain, but also gather together great heaps thereof into their nests, as is often seene when at any time their nests are found, some having more, some lesse, according to their labours.

And albeit in other soyles where the graine is sowne above furrow, and so harrowed in, and laid much more close and safe, they cannot do so much hurt as in the former, yet even with these they will with their feet dig out the corn in great abundance, and though in lesse measure, yet do hurt that is unsufferable; so that to conclude, neither Rye, Barley, Oats, nor any other smaller and more tender seeds, are free from their annoyance and destruction.

Now the cure and prevention for these Field Rats, or Mice, are divers, according to the opinions of divers Authors, and divers of our best experienced Husbandmen: for some use in the Dog Dayes, or Canicular Dayes, when the fields are commonly bare, to search out the holes and nests of these Rats and Mice, which are easily known, being little rounds holes in the earth, made so round and artificially as if they were made with an *Auger*, no bigger then the body of the creature that was to lye in it, and into these holes they use to put a few *Hemlock seeds*, of which when the beast tast, it is present death unto them: Others use to sprinkle upon the land *Hellebor*, or neesing powder mixt with Barley meal, of which the Mice and Rats will greedily feed, and it is a deadly bane and present death unto them.

Lastly (and which is the best medicine) if you take a good quantity of ordinary green glasse, beaten also to powder, and as much

Copperas or vitriol beaten also to powder, and mixe them with course honey, til it come to a past, and then lay it in the holes, and most suspicious places, and it will neither leave Rat nor Mouse about all your fields, but sodainly destroy them.

Of Worms.

The next great destroyers of Corn and Grain, are *Wormes*, and they destroy it in the sprouting, then when the ground hath rotted it, and the white or milkie substance breaking open the upper husk, shooteth forth in little white threds at both ends, upon which whilst it is so moist and tender, the *worme* feedeth extreamly, and so devouring up the substance or sperme, is the cause the Corn cannot grow or get out of the ground, and these *wormes* being as it were the main citizens within the earth, are so innumerable, that the losse which is bred by them is infinite.

The Cure.

Now the cure or prevention for these *Wormes* is diversly taken: for some Husbandmen use but onely to strike into the Plow Rest, and under the lowest edge of the shebord certaine crooked spikes of iron of great nailes half driven in, and turned back again, with which as the Plow runs tearing in the ground, and turnes up the furrow, those pieces of Iron kill and tear in pieces such *Wormes* as are either within or under the furrow that the Plow casts up, and this is sure a very good Husbandly Practice, but not sufficient for the destroying of such a secret hurtfull vermine which is so innumerable, and lies so much concealed: therefore, more curious husbands use besides this help of the Plow, to take Oxe dung and mix it with straw, and then to burn it up in the land, making a great smoke over all the land, immediately before you plow it for seed, and it is thought that this will kill all the *wormes* which lie so high in the earth, as to hurt the Corn.

Others use, before they make either the mixture or the smok, to wet the straw in strong Lye, and then adding it to the dung, the smoke will be so much the stronger, and the worms kild the sooner; or if you sprinkle strong lye upon your seed before you sow it, there is not any *worme* that will touch the graine after: also if you take hemp and boyl it in water, and with the water sprinkle your seed before you sow it, not any

Of Rye not to worm will come neer to touch it.
be wet.

Yet it is to be observed in this rule of wetting your seed corn that

that by no meanes you must wet your seed Rye, for it is a Grain so warme and tender that it will nether indure cold, wet, nor stiff ground, insomuch that the plowman hath a proverb, that Rye will drown in the Hopper; that is to say, it must neither be sown on wet ground, nor in a wet day, since present showres are apt to destroy.

Lastly, it is thought that oft plowing your ground in the wane of the Moon is a very good meanes to destroy both.

Touching that practice which many use, to gather the worms from their lands at Sun rise, in bright dewie mornings and Sun-set when the worms couple above the earth, I hold it more fit for small gardens, then large Corn fields.

The next great destroyers of Corn are Snails, and they destroy it after it is sprouted, feeding upon the tender white threads & fions which start from the seed and would rise above the earth, being the stemme or stalk on which the eares should grow (were it not devoured & eaten up by the Snails, & such like Vermine) as soon as it begins to peepe up, or as it were to open the earth, wherby it is driven back and forced to dye in the earth: for these creatures sucking upon the tender sweetness, deprive it both of life and nourishment.

Of Snails.

The cure and prevention for this evill, is to take the soot of a Chimney, and after your Corn hath beene sown a week or ten days, or within two or three dayes after the first shower of Rain which shall fall after the Corn is sown; you shall sow this soot of the Chimney thinly over the land, and not a Snail will indure to come thereon: Others use (especially in *France* and those more fertile Countries) to take common oyle lees, and after the corn hath been sown and is ready to appear above the ground, to sprinkle it all over the lands, by which meanes no Snail or such like creature will endure to come neer the same.

The Cure.

The next great destroyer of corne is accounted the Grasshopper, and he also destroyeth it after it is sprouted, and appeareth above ground, as the Snail doth, but somewhat more greedily, for he not only feedeth on the tender white strings, but upon the first green leaves that appeare also; by which meanes the Corne is not able to spring or bring forth a stemme or stalk to bear

Of Grasshoppers.

the ear upon; or if it do put forth an , it is so small, weak and wretched, that the ear growing on the same, is withered and lean, and the grain dry and blasted, and no better then chaff: nor is there any corn that escapeth the destruction of the Grasshopper, for he generally feedeth on all: first on Wheat and Rye, because they are the earliest, then on the Barly and Oats, and lastly on pulse, upon whose leafe, and blossome he feedeth, whilst the first is sweet and pleasant, or the other green.

The Cure.

Now the cure or prevention for these creatures, is according to the opinion of some Husbandmen, to take worme-wood, and boyle it well in water, till the strength of the worme-wood be gone thereinto, and then with that water, in the month of May to sprinkle all your corn over when the sun is rising or setting: and not any Grasshopper will come neer, or annoy the same. Others use instead of worm-wood to boyl centaury, and to use the water thereof in the same manner as afore-said, and find an equall and right profit in the same: but it is most certain that any bitter concoction whatsoever used and applyed as afore-said, will not leave any Grasshopper about your fields, for any bitterneffe is such an enemy unto them, that they cannot live where they feel any tast thereof.

Of Moles.

The last offence of living creatures belonging to corn or grain are Moales, which not only feed upon it after it is sprouted, and spindled, by eating up the roots thereof, & so consequently by killing the whole corn: but also by their digging and undermining of the earth, do root up the corn and destroy it in most wonderfull manner, for where they make their haunts, or are suffered to digge, there they will destroy almost half an acre in a day: neither make they choice either of grounds or grain, for all grounds and grains are alike, if the ground be not too wet, or subject to inundations, or overflowes (as for the most part corn-grounds are not) for above all things Moals cannot indure wet ground, or earth of too moist quality.

The Cure.

Now the best cure or prevention against these creatures, is to find out the trenches and passages, which are most plain and easie to be known by the turning up of the new earth, and digging crosse holes in the same, to watch either the going forth, or the comming back of the Moal, and when you see her cast, to strike her

her, with an iron fork made of many grains, as eight or six at the least, and so to kill and destroy them; which is so generally known amongst Husbandmen, that it is become a trade and occupation among them, so that it needs no further description; and the rather, in as much as for three or four pence a score, you may have any ground cleansed of Moals whatsoever.

Now there be some others which have not this part of killing or catching of Moales, which onely do take brimstone and wet stinking straw, or any thing else that will make a stinking smoak, and putting fire thereto, smoak all the places of their haunts, and by that means drive them all cleane away from the corn lands: many other practises they have, but none so good, certain, and probable as these already declared.

Thus far I have spoken of those offences which proceed from living creatures, I will now intreat of those which come and grow from the influence of the heavens, being malignant vapours which striking into the earth, do alter the sweet and pleasant nourishment thereof, and change it into bitternesse and rottennesse, whereby the corn is either flaine outright, withered and made lean & unkindly, or else the kernell turns to a filthy blacknesse, being bitter, dry and dusty, like unto smoak, which the Husbandmen call smuttines, or mildewing. It commeth also another way, as namely by over ranknesse, or too much fatnesse of the earth, and this happeneth most commonly only to wheat, for if blacknesse happen to any other grain, it commeth of blasting, or other malice of the Stars, for ranknesse of the ground in Barley, Rye, or Oates, & only makes them lye flat to the ground, the stalke not being able to support the multiplicity of the eares, and so by that means the graine wanting his true nourishment, growes withered, and of no validity; now that this is most easie to be found out, the ranknesse of the growing corn rising as it were in close bundles together, and the deep blacknesse of the greene blades will with small travell shew you.

This to cure and prevent, it shall be good before you sow your Graine, to sow your land lightly over with chalk, for that will abate his over ranknesse.

There be other malignant qualities which proceed from the influences of the heavens, or rather from the qualities of the

Offences from
the influence
of the heaven.

Of smuttinesse
and mildew.

The Cure.

Additions.

Plantes

Planets or Elements, which do many dangerous hurts unto corn, as namely the Haile, the lightning, the Thunder, or the Planet-stroke, or blasting, for all which the ancient Husbandmen have suggested severall Cures, as namely for the Haile, to plant the White-Vine, or stick the branches thereof in the Corn field, or the lightning, to close a Hedge Toade in an Earthen Pot, and burying her in the Corne-fielde, or to plant hang up the feathers of an Eagle, or a Seale skinne, or to Lawrell therein: For the Thunder, to ring Bells, to shoot off great Ordnance, or to burn stinking weedes in the Corne-field: And for blasting, to take the farre horne of an Oxe, and mixing it with dung, to burne it in the Corn-field, or to take the branches of the Bay-tree, and to plant them in the Corne-field: but in as much as all these, and many other the like, smell rather of conjuration, charme, or exorcisme, then of any probability of truth; I will neither here stand much upon them, nor perswade any man to give further credit unto them, then as to the vapours of mens braines, which do produce much many times out of meer imagination; and so I will proceed unto those things which are of farre greater likelihood.

Of frosts.

The next evill which happeneth unto Corn or Grain, is that which commeth by frosts and sharp nipping colds, which starving the root, and binding up all nourishment, maketh the Corn dry, whither, and never prosper; and then the violence of the frosts there is nothing more bitter to plants and seeds, for even Rasor-like it cutteth the veins and sinews in peices, and as sharp needles pricketh the heart of every growing thing: for as the fire which is most hot, when it rageth, burneth, and consumeth all things, so the frost which is most cold when it continueth, starveth, and choaketh, or stiflith whatsoever it embraceth.

The cure.

Now the cure or prevention for those evils which do happen to graine by these great frosts, is as some Husband-men suppose, to cover the land over when it is sowne, with ashes, others spread straw or rotten litter upon their Corn, and not any of them but is sufficient to prevent the worst injury that frost can do.

Myfts and fogs.

The most malignant quality which offendeth grain, is myft and

and fog, which being naughty vapours drawn from the infected parts of the Earth, and fall upon the Corn, do not onely make the graine leprous, but also infecting the better Earth after the kindly nourishment thereof, and as it were distilling corruption in the veins, makes all that depends thereupon most leprous and unwholsom, and thereby altereth the quality, quite turning sweetnesse into bitternesse, fulnesse into emptinesse, and goodnesse into badnesse, to the great losse of the Husbandmen, and the much disreputation of the ground.

Now the cure and prevention of this evill, according to the opinions of all the best Husbandmen, is to take weeds green, the twigs of bramble, and other brush wood, wet straw or such like stuffe, and binding them in great bundles, to put fire thereto, making a great and violent smoke, and then taking the advantage of the wind, to walk up and down the field and smoak it, which is thought a certaine remedy to take away those inconveniencies which happen by violence and poison of these mysts and fogs. The cure.

Now to conclude, the diseases and infirmities which happen to corn whilest it is in the field, there is not any formerly spoken of more dangerous, or of vilder quality then the reaping, mowing, or gathering in of Corn, wet, or too green, and unhardned, for such moisture, when the corne is sheafed up close together, or stackt or mowed up, forthwith gathereth heat, and either setteth the Corn on fire, or else the moisture being of lesse quantity, and not apt to flame, yet it corrupteth the grain and straw, & breedeth a stinking mouldiness or rottenness about it: so that the grain either becomes dung and dirt, or at least so stinking and unflavorous, that it is good for no use or purpose, as is daily seen when carelesse husbands gather in their grain without respect or government, making the old proverb good, that hast ever brings wast. Corn reapt wet.

The cure and prevention of this evill, is the well husbanding and managing of the harvest, as first with a carefull and well judging eye to look upon your corn, and to know by the hanging downward of the eare, (looking as it were back to the ground) and by the hardnesse of the graine, whether it be ripe or no; then to look into the cleannesse of the corn, as whether it

be full of greenesse, as grasse, weeds, and such like: or cleane of it self without any mixture: if you find there be any weedes mixt with it, then you may reap it so much the sooner, though the kernel be not so well hardned as you would wish: and above all things have a care never to shear Corne in the rain or wet, no not so much as with the mornings or evenings dew upon it, but even in the heat and brightnesse of the day. Then having reapt your Corne so full of grasse and weedes, you shall by no meanes sheafe it, but spreading it thin in the Sunne, let the grasse wither all that day, which when you perceive to change colour and grow dry, then bind it up in sheafes, and let it lye single a day, that the winde and Sunne may get into it, and dry the greens more sufficiently; then lay in shockes of six or eight sheafes a peece, and in those shockes, turne the eares so inward, that the other bigger ends may defend them from all raine, wet or dew that may befall upon them; then a day or two after, lay them in shockes of twenty, or of four and twenty sheafes a peece, and in those shockes, let them take a sweat, then break them open in a bright Sunne shine day, and letting the air passe thorow them to dry them, forthwith leade the graine home, and house it or stack it in such sort as was shewed in the former Chapter, and be sure the graine thus ordered and dryed can never take hurt: but if the season of the yeare fall out so extraordinary evill and full of wet, that by no meanes you can get your Corne dry home (which although it be seldome seene, yet it is possible to be seen) in this case you must bring it home as well as you can, and having your Kilne well ordered and bedded, you shall lay as many sheafes thereon, as it can containe, and turning and tossing them over a very gentle fire, by slow degrees dry them very perfectly as neare as you can, with no greater a heat then that which the Sunne giveth, and then mow and stack them up at your pleasure, for the aire will sweeten them againe, and take away all smell of smoke or other annoyance; onely observe, not to stack them up whilst the fire or heat is in them, but when they are cold, and so they will be as sweet as may be.

Of corn washr.

Now is it not amisse that I speak here a word or two of washt

washt Corn, or the washing of Corn: True it is (as before I have written) that all sorts of Wheat whatsoever, are subject either by the ranknesse of the ground, blasting, or else mildewing, to a kind of filthy sooty blacknesse, as is already shewed; and this sooty Corn is taken two wayes, generally and particularly: generally, if the whole land be stricken, and no corne saved, but all spoyled, which is called mildewed; or particularly, where but some certain eares are struck, or some certain part of the grain, as when it is black at both ends, yet full and sound in the midst, and this is called smutcht corn, being disfigured in part, and not in all. This smutcht Corn which is stricken here and there, if the blasted eares be not culled out from the other, (which to do is an husbandry exceeding good and very worthy) when it cometh under the flayle, the dust of those black blasted eares will so foul all the rest of the corn, that it will look black and illfavored, and so become unserviceable and unmarketable; for the blasted corn is both bitter and unwholsome: In this case, you must of force wash this corn, and you must do it in two or three waters, till you see all the blacknesse quite gone; which done, then drain away your water clean, and laying the corn on fair window cloathes, or coverlids, lay it in the heat of the Sunne, and so dry it again till it be so hard that it will grind: But if the time of the year will not serve for the Sunnes drying it, then you shall dry it on a Kiln with a very soft and gentle fire, and then coole it in the aire to recover the sweetnesse again, and then the corn is as serviceable as any other, onely for seed it will by no meanes serve, both by meanes of the blasting, which makes the kernell imperfect at both ends where it should sprout, as also the too much drying thereof, by which it is so much hardned, that the ground hath no strength to resolve it; therefore it is the Office of every Husbandman when he chuseth his seed corn, to eschew by all means this washt corn as a grain that is lost in the earth, and will by no means grow.

Therefore that you may know washt corn from all other corn, and so not to be cozened by any deceit in the ill Husbandman, you shall take it up into your hand, and if the corn look

To know
washt corn,

look bright; clear, and shining, being all of one entire colour, without change or difference, then be sure the corn is unwasht and perfect.

But if you find it look whiter at the ends then in any other part of the corn, and that the whitenesse is black and not shining, so that there is a changeable colour in the corn, then be assured that the corn is washt, and then by no means apt for seed or increase.

Againe, put three or four grains into your mouth, and chew them, and if then the tast be sweet and pleasant, and grind mellow and gently between your teeth; then is the corn not washt: but if it have a bitterish, or fleshy raw tast, and grind hard between your teeth, or with much roughnesse, then hath the corn been washt, and dryed againe, and is not good for seed: also when corn is more then ordinarily moist, or more then ordinarily dry, both are very ill signes, and shew either imperfect corn, or imperfect keeping, for the best and good corn indeed, ever holdeth an indifferent temperature, betwixt drinesse and moisture.

CHAP. 18.

How to keepe all manner of graine, either thrasht or unthrasht with least losse the longest time; and how to preserve it from all infirmitie and vermine in the house or garner.

Keeping of
corn twofold.

Keeping corn
in the ear or
in the chaffe.

TO proceed to the keeping and preserving of corn and grain it is to be understood, that it is to be done two severall waies, that is to say, in the eare and out of the eare: in the stack, when it is joyned with the Straw and Chaffe, or in the Garner, when it is clenfed and dressed.

Touching the keeping of Corn in the Ear or in the Stack, there is no better nor safer way then that already described in 16 Chapter, being free from all offences whatsoever that can come to hurt it.

Now there be others that cut off the eares of their corn, and then put them into great Chests or Hutches of wood (such as are very frequent and much in use in *Ireland*, and other Countries where war rageth) and so keep it sweet and good many yeares:

Others

Others use to beat it out of the eare, but not separate it from the Chaffe, and then laying a lear of the Straw more then a foot thick, to lay a good thick lear of the thrasht corn; & thus lay lear upon leare, till you have made up your Stack, in such proportion as you shall think convenient; and this will keep all kind of corn, or grain, or other Seeds, sound, sweet, and fit for any purpose, at least a dozen yeer, or more, as some have supposed, without either too much drying, withering, moistening, or moulding. And sure this is a very excellent way for the storing up of much corn in a very little roome, and may as well be done with corn as with straw: onely it is not to be done in barne nor house, because Mice, Rats, and other kind of vermine will work much destruction thereupon, but on a Sack or Hovell made and proportioned in such form as was shewed before in the sixteenth chapter, and so it will stand safe without all annoyance, as long as it shall please the owner to keep it; sure I am, it will last thus fully twelve yeares, yet some Authors affirme it will last fifty yeares, but that is a space of yeares beyond my tryall.

Touching the keeping of corn after it is thrasht and drest, it is divers wayes to be done, as by stowage or place of lear, as Garners, Hutches, and such like, by labour and industry, as with the shovell, or else by device or medicine.

Keeping of
corn out of
the Eare or
drest.

For Garners, they be made divers wayes, according to the nature of the country, and custome of the people.

Of Garners.

Some are made with clay and lome troden with hair, straw chopt, and such like: but these are the worst, and do soonest corrupt corn: for although they are warm, which is a great preservation to corn, yet they yeeld dust, and from that dust is bred fleas, mites, weavels, and other Vermine which spoyle corne, and make it easily rot.

Others are made of stone and lime, but they are subiect, against wet weather, to yeeld forth a moist dew which corrupteth and rotteth corn.

Others are made of Brick and Lime, and they are very good against the weavell, and other small Vermine, but the Lime is sharp, and so consequently very unwholesome for all manner of Grain.

The best Garner that can be made to keep all manner of grain

in, is made of plaister, burnt and brought into mortar, and so raising it up with the help of smal stones hidden and placed in the midst of the wall, to make both the inside and outside of the Garner of smooth plaister, no stone being seen, but hidden at least two fingers thick on each side, and all the bottom also must be made of plaister; for no floor keepeth Corn so well, of what kind soever it be: and these Garners would be placed as neere as you can to the backes or sides of Chimneyes, or as neer the ayre of the fire as you can conveniently; for as there is nothing more cold then plaister, yet it is ever so dry and free from moisture, that with no change of the ayr or weather it relenteth, but keepeth the Corn ever in one state of goodnesse, whilst the warm standing thereof is such a comfort in the winter, and the naturall coolenesse of the thing so soveraign in Summer, that the grain ever abideth in one stay without alteration.

Of hutches.

Now for hutches, or great chests, bins, dry fats, and such like, they are made of old, dry, and well seasoned Oak boards, plain-ed smooth and close ioyned and glewed together, with covers and lids made also very close, whereby little or no ayre can come in: some of these great byns, or hutches, made of dry boards, are made open and without covers, but they are not so good, for the ayre cooling the upper part of the Corn, and the middle part sweating, breedeth corruption, or mustines, which hurteth and spoyleth the corn: besides, they are somewhat too warm, and thereby make any green corn apt to corrupt and smell.

Touching the use of Garners and Hutches, they are principally to keep Malt after it is dryed, or Barley which is for the use of bread or meale: and here is to be noted, that the best manner of keeping malt, is to keep it in the corn, that is to say, in the dust and other filth which cometh with it from the kilne, as thus; when first you lay your malt on the kilne to be dryed, you know there is at one end a certain sprout, or small thred, which growes from the corn, and it is called the come, which by the rubbing and drying of the malt falls away, and leaves the corn clean, and smug of it self, and when you trim and dress up your malt for the mill, is winnowed and cleansed away: this you shall preserve and put altogether into your Garner or hutch, which

which will to mellow and ripen your malt, that in the spending thereof, a peck will go further, then a peck and a half kept of a contrary fashion, and although some are perswaded that this come or malt dust, is a great breeder of the worm or wevell, by reason of the much heat thereof, being indeed of the purst of the heart of the corn; yet it is not so, unlesse some danknesse or moisture do get to the corn; and then it breeds wevells in infinite aboundance, and therefore by all meanes be sure that your Garners, and hutches, do stand exceeding dry, and then there is no fear of the losse of corn, nor shall you need to dresse or winnow your malt but as you spend it.

Lastly, here is to be noted, that although I here joyn Garners, Hutches, chests, and byns together, yet I make them not all of equall goodnesse; for the plaister garner is absolutely the best of all, the close hutch or chest next, and the open byn last; yet any, or all, sufficient enough to keep malt, barley, or small seeds, divers years without imperfection.

It is written by some of the antientest Authors, that Wheat hath been kept in these close hutches or chests sweet, the space of fifty years, yet I hold the rule somewhat doubtfull, both because Wheat of it selfe, lying so close packt together, is apt to heat and sweate, and that heat commonly turneth to faultinesse, and the sweat to corruption; but that it may thus be preserved from wormes, wevells, mytes, and other vermine, breeding in corn, it is doubtlesse and infallible.

Now for the preservation of Wheat, which is the most principall graine, of greatest use, and greatest price, and therewithall most tender, and aptest to take hurt, the experiments are diverse, as mens fancies, and practises have found out: for some Husband-men hold opinion, especially the *French* and *Spanish*, that if you take the lets of common oyl (so it be sweet) and sprinkle it upon your wheat as it lies, either in the garner, or upon the floor, that it will preserve it from all corruption and annoyance whatsoever, nor doth it preserve Wheat only, but all other manner of grain whatsoever; nor doth it preserve corn alone from mischief, but if corn by casualty be tainted or hurt, it doth recover it again, and brings it to the first sweetnesse; and if either worms or weavels be bred in it, the oyl presently

To preserve
Wheat.

kills them, and frees the corn from that mischief: as for smaller seeds, as hemp, line and rape, this oyle doth not onely keep them long and sound, but also feeds and nourishes them, and makes them better, either for the ground, or for use, either in the mill or in medicine.

There be others that use to take chalk, and beat it to powder, and then scatter it amongst their Wheat, when they put it into the garner, and have found that thereby their graine hath been wonderfully preserved from all imperfection; and surely there is great reason for the same, because the drinesse of the chalk drinketh up the moisture which sweateth from the grain, and is the first breeder of all putrifaction: also it cooleth and asswageth the immoderate heat which is ingendred in the Corne, by reason of the packt and close lying together.

Again, there be others which use to lay great store of worm-wood among their wheat, which likewise preserveth it from all annoyances, especially from worms and weavels, as also from Mice, Rats, and such devouring vermine; neither will the Corn corrupt or grow faulty, as long as the Worm-wood remains amongst it. In *Italy* the carefull Husbands use to take a certain dry earth or clay, called earth of *Olinthus* or *Cerintus*, and this earth they beat amongst their Wheat, and then put it into the Garner or Hutch, and it will keep it sound and sweet divers years together; then when they have occasion to use it, with small reeing sives to dresse it from the Corn, and so preserve the dust, which will last and serve you many years together, even almost an age, as some have reported, and is at this day to be seen in many parts of *Italy*, and other places.

Again, I have for mine own part seen in the Island of the *Azores*, certain very great and large Caves, or pits made under the earth, of the fashion of a *Spanish* earthen leare, that is to say, great and spacious in the midst, and narrow both at the top and bottome, like a brasse pot, or great glasse viall, and made as smooth within as may be, and in these caves or pits, they first lay chaffe, and then their thrasht Wheat, filling it up full to the top, or within a handfull thereof, which they fill again with Chaffe, and then closing the top with a broad stone, they cover

it

it over with earth so close and unperceivable, that you may walk or travell over it without any suspicion; and for mine owne part, I have my self digged up many of these pits, and found great store of wheat, both in the high wayes, and other most suspicious places; and surely it is thought, and experience in those places makes it good, that in these caves or pits you may keepe wheat as long as you please, as *Pliny* speaketh of, which is an hundred, or an hundred and twenty years, without hurt or putrefaction either of heat, moysture, wormes, weavels, or any other vermine whatsoever which consumerh or devoureth Corn; yet how I may recommend this experiment to our nation, I am uncertain, because the much moysture of our climate, and the cold rawnesse thereof promifeth a contrary effect; for the great enemies unto graine, are violent cold and moisture, and with us it is very difficult to make any caverns under the earth, but they must be subiect unto both: therefore onely to those which live in hot sandy countries, high and free from springs or waters, or in dry and rocky grounds, where these mynes or hollow places may be hewed out, as in a main and firm quarry, I recommend the tryal of this practise, with this assurance that where the ground is fit for that purpose, as in any of your sand grounds or gravelly earths, as in *Norfolk*, *Middlesex*, *Kent*, and many other sandy climates; or in rocky scituations, as in *Nottingham*, *Bath*, *Bristol*, and such like, you may keep your wheat good, sound, firm, and free from all annoyances, even as long as you shall please to keep it, both without putrefaction in it self, or wast made by other devouring worms and vermine; but if in a more moist place, as in clay or other mixt earth, which ever is vomiting wet and dewish humors, you are forced to approve this experiment; then you must necessarily lyme all your cave or hollow mine within, at least half a foot thick with tyle sherd and plaister laid wall-like together, and then the plaister dawb'd at least three fingers thick above all, and so you may keep your corn as safe and as sound as any hot soil whatsoever, but without it, your corn will not indure a week without rottenness, faultiness, mouldiness, and stinking.

To conclude, having shewed you all the most approved and best experiments for the keeping and preserving of wheat, there

is none better, or so good as this poor silly plain one, which I will here deliver: and that is, first, as near as you can, reap your wheat at the change of the moon; for wheat which is so reaped, is seldom or never subject to losse or putrefaction (being got in dry, or in husbandly manner ordered and handled) because that celestiall body hath such a power and influence in the growth of corn and seeds, that as she groweth so they grow, and as she waneeth, so they abate and wither.

And truly for my own part, in my poor husbandry, I have made this observation, that I have reaped Corn at the beginning of the wane (to mine eye and judgment) great, full, and bold, as the plow-man calls it, and within few dayes after, when it came to thrashing, I have found it most poor, hungry, and small corn: nor could I give or find any other reason for the same, but that it was reaped in an ill and most unseasonable time: for on the contrary part, I have ever found that corn reaped upon the change, being ripe, full, and every way fit for the barn (and the weather fair and dry above head) it hath never altered; but kept his first and perfect goodnesse, so that I cannot chuse, but in this case think the observation of the moone to be a thing of great effect and validity, appoynted by God as a second meanes for our help and profit: when therefore your corn is thus seasonably and well got in, you shall thrash it, winnow it, and dress it so clean as you can; then carry it up into your chambers or lofts appointed for that purpose, and whose floores by all meanes I would wish to be cast of the best plaister; for board is too hot, and clay is too apt to breed vermine: On this plaister floor you shall spread your wheat, not above a foot thick at the uppermost, and so let it lie, observing once in foure or in five dayes at the most, with a large wooden shovell to turn the wheat quite over & over, and thus doing, you shal be sure to keep it as sweet, sound and good, as when it first came into the barn: for neither can the heat, sweat nor coldnesse offend it, the first being cooled and tempered by the opening and dispersing; the second dried up by the ayre which hath free recourse into it, and the last comforted by the labour and tossing of the shovell, casting it up and downe from one place to another: and though some curious husbands may object that this manner of keeping corn drieth

it somewhat too much and thereby disableth it for some particular purposes, as for seed and such like; yet in that they are much mistaken: for this stirring and moving of Grain, is not a drying of it, but rather a great comforter and strengthner of it, dispersing back into the corn, those wholesom vapours which should do it good (by way of communication and fellowship with the Grain) and expelling those ill humors which sweating out of it would otherwise confound and hurt it, so that in conclusion for the true and long keeping of wheat sweet, sound, and perfit, without losse or corruption, there is no way more safe or easie, then this last expressed, being of all other the best, although in shew it appear sleight and triviall, as for the most part things of greatest moment in this nature do; but to the judicious Husbandman I refer it, whose aym is at the worth and substance, not at the words and curious glosse, set forth in strange ingredients.

Touching the keeping of Rye or Masline, or as some call it To preserve
munck-corn, or blend-corn, being part Rye, and part wheat Rye.
mixed together, that which preserveth wheat will also preserve it, for they are grain of like nature, onely the Rye is somewhat hotter and dryer, and therefore will endure somewhat more moisture; yet to speak particularly touching the preservation of Rye, there is nothing better then the plaister floor, and oft turning; the close Hutch is also exceeding good, so is the Pipe or dryfat, but being once opened, and the ayre entering into the corne, except it be soone spent, it will soon putrifie, for though in the close keeping, it last long, yet when it comes to the ayre it will quickly receive taint. Lastly, for the profit in keeping of Rye, indeed there is nothing better then to ply it and tread it hard into hard vessels or barrells, wherein sale hath been much lodged, or other brine or salt matter: provided alwaies that the vessels be sweet and untainted, no wayes subiect to faultinesse or other unfavourie smells, from which there is no preservation.

Concerning the preservation and keeping of Beanes, To preserve
are indeed a more grosse and fatter Graine then any heretofore Beanes.
written of, and out of the fulnesse of their substance, more subject to moisture and those dankish humors which corrupt corn:

the carefull husbandman observeth two rules; first, not to thrash any Beanes or Pulse, more then for necessary use (as for the Stable or Mill) before it be midde *March*, at which time the Graine having taken a kindly sweat in the Mow, Sack, or Hovell, is become so dry, firme, and so id, that no floore, wall, or other place of Leare can make it relent or give again (except great abuse, and too moist keeping) for it is to be understood, that this sort of Pulse or Grain is of it self so exceeding moist and apt to sweat in the Mow, that all Husbandmen endeavour by no meanes to house it, or lay it within doores, but seek to make it up in stacks and hovels without dores, not so much that house roome is wanting, as that the benefit of the Sunne, and Aire, which pierceth through the same, dryeth and ripeneth the corn in such kindly manner, as maketh it as serviceable as any other: and indeed, the first invention of stacks, hovels, reeks, and such like, did not spring so much from the want of housing as from the good and profit which the Husbandman found to accrue to this kinde of Grain, onely by reason of laying it abroad; for it is certain, that Beanes and Pease neither grow together, nor ripen together, but put forth their increase one after another; for you shall see upon one stalke, bloomes, swads, and ripe cods: so likewise in the gathering of Pulse (when it is reaped from the ground) you shall see some dry and withered, some ripe, some halfe ripe, some absolutely green, and as but now in growing.

Now all these must be reapt together, and if you stay them in the field till all be of like driness, questionlesse the oldest will shake and shed upon the ground before the youngest be ripened, and what that losse will redound to, every Husbandman can judge: So also to house and mow up in a close mow, the dry pulse with the green, surely the green cannot chuse but inflame, and heat the dry, and the dry so heated to give fire to the green, till both be either rotted or consumed: and hence it came, that expert Husbandmen devised to lay their pulse, for the most part, ever without doors, in stacks, reekes, and hovels, that the Sun and wind passing thorow them, might bring all the graine to an equall drynesse and hardnesse.

Again, Pulse being of all grain the coursest and fullest of substance

stance in it self, and the straw ever big and substantiall, and full of broad thick leaves, ever moist and sappy; it must needs follow that this grain must ever be most apt to twear in the mow, and so necessarily craveth the greatest store of aire, and the longest time in drying; so that to return to my first purpose, it must needs follow, that no beanes or pease can be ripe or seasoned in the mow, till it be mid *March* at least; for it is an old saying, among the best husbands, *That a March wind is salt which seasoneth all Pulse*: And if use or necessity compel men to thrash their Pulse before that time, the grain is so imperfect, that it must be kiln-dryed, or else it is fit neither for the use of bread nor provender.

Now herein is to be understood, that pease or beanes which are kiln-dryed, may be kept sound, sweet, and good, either on plaster floores, boarded floores, or earthy floores, the space of many yeares, without turning, or tossing; nor need you to respect how thick the heap lye, since beanes after they are once dryed on the kiln, or in the Sunne, never after will thaw, give againe or relent, but remaine in their first soundnesse: But if you preserve your Beanes for other uses, as to boyl in your pot, and feed your servants withall, as is used in *Somerset-shire*, and many other Westerly parts of this Kingdom, then it shall be good for you to take oyl barrells, oyl cask that is sweet, and first Calk them all over within and without with ashes, and then put your beanes therein, and close up the heads, and as it is affirmed by divers great Authors of Husbandry, it will keep beanes sound, sweet and good, twenty yeares: nay, some give instances of Beanes which have been thus kept and preserved the space of one hundred and twenty yeares; and surely I am perswaded that if Beanes be well and dry got, and threst at a seasonable time of the yeare, as in *March* or *April*, that thus kept, they will last the uttermost of a mans pleasure.

Now for the keeping or preserving of Pease or Fetches, which of all other Grain whatsoever, is most subject to rottenesse and imperfection, because out of its own nature it is apt to breed wormes, weavills, and mites, by reason of the much lushiousness and sweetnesse of the kernell of the Graine; you shal in all things observe the same courses that you do with your

Preserving of
pease or fetches

Beanes, both touching your gathering, drying, stacking, and also thrashing; for as they are most apt to go together, being near of nature and condition one to the other, so it is fit that you do apply unto them one and the selfsame medicine or remedy.

And herein is to be noted, that as pease are of more generall use then beanes, as for horse provender, feeding of Swine, Pigeons, Pullen, and such like; as also for bread, pottage, to boyle with, or without meat, for certainly it is a most wholesome and strong food, as may be seen by the people of *Devonshire, Cornwall, and Somersetshire*, to whose great strength of body not any reason can be given more probably then their much feeding on this Grain, and their acquaintance with much and strong labour, so they ought with more care and circumspection to be preserved from all those annoyances that naturally are apt to hurt them, as wormes, rottenesse, mould, mustinesse, and such like.

And first, there is nothing better for the long and well keeping of Pease, then the very well drying of them, either in the Sun, or on the Kiln, especially those which you use for bread, provender, or feeding of Swine: and although some husbands use to feed swine with undryed Pease, nay many times both undryed and undrest, that is to say, the Pulse or Chaffe not taken away, and are of opinion that the Grain so given, sooner feedeth and puffeth up Swine then the other, yet they are deceived; for albeit it swell and puff up a beast, yet is the flesh and fat neither so good, sound, and long lasting, as that which is gotten with dry food, nor doth it make a Swine so thirsty; and the Husbandman is ever assured, that when his Swine drinks not well, he feeds not well: therefore what Pease you keep for bread, or feeding of Cattell, by all meanes dry them well, and lay them either in Garners or Floors, and they will last sound and good without breeding worms or wevel, as long time as you please. But those which you keep for food at your own Table, as in pottage, or other uses, must by no meanes be too much dried, because then they ask a double time in boyling, and spend a double quantity of fewel in their preparing.

Some

Some use after they be clean thrasht and drest, to lay them in a cool close Garner, either of Plaster, Earth, or Boords, of which Plaster is the best; as for any thing that relenteth or yeeldeth moysture, as lyme, stonewalls, or such like, it is most hurtfull, and immediately maketh pease mould and rot: also it is good to lay your pease in thick heapes in your Garner, for that will preserve them moyst the longer time, but to spread them thin upon the floor, by which means the Sunne, Ayr, and wind may passe thorow them, is not so good, for it dryeth them too fore, and taketh from them much of their sweetnesse and goodnesse, which ought most carefully to be preserved. There be others which preserve these tender meat-Pease by thrashing them up, and then letting them lie in their own pulse or chaffe, and not dressing them, but as they have occasion to use them; and questionlesse this is a very good and laudable way; for the pulse and chaffe doth maintain them sweet and moist, and yet keepeth them withall so warm and comfortable, that they last much longer, then any other way whatsoever: and in this manner of preserving pease is to be noted, that by all meanes you must let them lie upon a dry earth floore, so long as they are in the chaffe, rather then on the boord, or on plaister, and yet in this case the boords are better then plaister.

Lastly, and which indeed is the best experiment of all other, if you intend to keepe pease any extraordinary long time, you shall take Barrells or dry Cask, well and strongly bound, and pitch them within exceeding well, with the best pitch or bitumen that you can get, and then sprinkle the pitch all over with strong vinegar, then take your pease, being clean and well drest, and put them into the barrells, pressing them down close and hard; then head up the barrells, and let them stand dry and cool, and they will preserve your pease sound, sweet, and good for any use whatsoever, as long as you please, be it for ten, twenty, or thirty yeares, according to the opinions of ancient Husbandmen, and other provant Masters, that have lived and commanded in towns besieged, and towns of Garrison; neither shall any worm, mite, or weevil, ever breed in it, or offend it: nay if any have in former

Preserving of
Lentile or
lupins.

time be bred in them, this manner of keeping the grain killeth them, and destroyeth them for ever.

Now there is another sort of Pulse which are call'd Lentils or Lupins, which albeit they are not so generally used for the food and sustinance of man, yet they are for horse, swine, and other cattle as much in request as any graine whatsoever, and indeed do feed fatter, and sooner then other ordinary pulse; and the flesh so fed is sweeter and pleasanter both to the eye and to the taste, then that which is fed with Beanes or Pease; also they are a Pulse very Physical and good for many medicines, as may appear by the workes of many learned Physicians; and these the longer they are kept, the better they are, and fuller of profit. To preserve them then in good and sound estate, it is meet to reap them in very fair weather, and to Stack them up exceeding dry, and if they be laid in the barn, or any close house, it is not amisse, for they will indure housing better then any other pulse, yet the sooner you beat them out of the straw, or thrash them up, the better it is; for Husbandmen suppose there is no greater hurt to this kind of graine, then the long keeping it in the straw; for it is of such ranknesse, that the very straw, and cods breed in it much putrefaction; and I my self observed both in Spaine, and in the neighbour Islands, where is great abundance of this kind of graine, that they do no sooner gather it and bring it home, but immediately they thrash it, nay, some thrash it in the fields upon the lands where it growes, and so bring it home, then spread it on faire boarded floores in very great heaps, or else lay it up in close hutches, or byns, such as wheat and other white grain is to be kept in. If you dry this kind of pulse in the Sun, or upon a kiln, with a very moderate and soft fire, and then lay it up either in close Garner, or close hutch, it will last many yeares sound, good, and without corruption. There be other husband-men which mixe with this grain when it is thrash'd, a half part of hot, dry, white Sand, or at least cover the whole heap of pulse with the sand, and doe find that it keeps the grain very sound and good many years together. But to conclude, if you take strong vinegar, and a good quantitie of *Laserpitium*, and dissolve and mix them very well together, & then having laid your Lentils or Lupins together on

a fair boarded floor, in large, broad, and flat heaps, about two foot, or two foot and a halfe thick, with the vinegar and *laserpitium* sprinkle over all the heap, and not any change of weather frosts, wormes, or other vermine shall do them hurt, but they shall remaine sound and good as many years as you please to keep them. there are other Husband-men that instead of this before rehearsed, take only sweet oyl, and sprinkle it all over the Grain, and find the same vertue and effect, for neither wormes nor other vermine will touch it, nor will the radicall humor thereof at any time wast or decay, but remain strong, full, and sound, without any kind of diminishing, nor shall you find any abatement of it, or shrinking in the measure, but that which was a bushell this year will be also a bushell the next year, and as many yeares after as you please, which is no small profit to the owner.

Whereas on the contrary part, if the grain be either dryed in the Sun, on the kiln, or by the wind, you shall hardly have of every such bushell so dryed, three pecks and a halfe againe, which is by computation at every quarter, which is eight bushels, full one bushel lost, and yet this Pulse thus preserved, as before said, shall be as good for any use whatsoever fit for such corn to be employed in, as any other dryed grain whatsoever, and yeeld as much every way, and altogether as good meal, and as good meat.

Now touching the preserving and keeping of Oates, it is to be understood that of all grain it is least casual, because of it self naturally it breedeth no evill vermine, and is againe preserved and defended with a double husk, whereby neither cold, moisture, heat, nor drinesse, is able so soone to pierce and hurt it as other graines, which are more thin clad and tender; yet because it is of great and necessary use both for cattell and pullen, and that neither the husband nor housewife can well keep house without it, you shall know, that the best way to preserve it longest, is, after it is thraht to dry it well, either in the Sun or on the kiln, and then either put it into close Garner or close cask, and it will keep many years sound and sweet.

Touching the preserving of Oat-meal, which is the inner kinnell of the Oates, and a graine of most speciall use in the Husband

band-mans house, as in his pottage, in his puddings, and in many other meats necessarily used for the labouring man; it is an experiment not altogether so curious as any of the rest formerly written of; for no Oat-meal can be made, but the Oats must be exceedingly well kiln-dryed, or else the kinnell will not part from the Hull, and being drye d, as is fit, that drying is sufficient to keep and preserve the Oat-meal divers years.

Provided ever, that presently after the making of your Oat-meal, you put it into dry close caske, or dry close garner (but caske is better) and so it may remaine exceding dry (for any thaw or moysture corrupts it) and as near as you can let it have (if it be possible) some ayre of the fire, for the warmer it stands, the better and longer it will last, as experience sheweth.

Preseruing of
any meal.

For the preseruing of long keeping of any sort of meal, there is no better way then first to boulte and searse him from his bran; for the bran is very apt to corrode and putrifie the meale, and to bring it to a faultinesse or mustinesse, then into very sweet and clean dry caske close and well bound, tread in your meale so hard as you can possibly tread it, and then head it up close, and so you may keep it either by land or water so long as you please, and when you have any occasion to spend of it, be sure to loosen no more of the meale then you presently use, for the faster and closer the meale lyeth together, the longer and sweeter it will last, for it is the gathering of the ayr that only corrupts it.

And here is also to be noted, that you should not presently as soon as your meal is ground, boulte it from the bran, but rather let it lie a week or fortnight in the bran, in some close bin or trough, and then after that time boulte or searse it, and you shall find it to afford you in every bushell, more meal by at least half a peck then if you should presently boulte it as soon as it comes from the mill; whence it proceeds, that the cunning and skilfull Baker will ever have a weeks or fortnights provision of meale before hand, which lying so long in the branne, payes double interest for the continuance.

Now if it fall out so, that either by trade of merchandise, or other occasions, you buy any meal by way of transportation which is caskt up (as much meal is sold by the barrel) you shall presently as soon as you have bought it (if it be for your owne use

use or expence) breake open the heads, and empty the meal upon fair sheets on a clean floor, and then spreading it abroad, let the Sun and Ayr passe thorow it, which will dry up the sweat, and if there be any taint of faultinesse, take it away, and bring the meal to his first sweetnesse, and then immediately boule out the course Bran, and after, as was before declared, tread it hard into fresh and sweet cask: and thus you may keep your provision of meal all the year long; nay, if need require, two or three years, for after the first sweat is taken away and kindly dried, there is no doubt to be made of any that shall follow after.

Lastly, touching the preserving and keeping of all manner of small seeds of what nature or quality soever they be, whither Hempe, Lime, Rape, Mustard Seed, or any other Garden Seede whatsoever, though truly and properly they last but one year, nor are fit for seed or Increase after that date expired; yet in as much as they are medicinable after, and a much longer time, therefore you shall understand that the best way to keep them safe and sound, and the fittest for use and profit, is first to gather them as soon as you perceive them to be ripe, and the weather being bright, clear and dry, then you shall dry and wither them in the shade, and not in the Sunne, especially upon a plasterd floor, where the light looketh to the South, and be sure that as little Sun and moysture come to them as you can, for both are main enemies; which done, bind them up in bundles without thrashing, and so hang them up, and keep them in their own cods, and they will last for all uses, a full year, and for some particular uses two or three years; and in this manner you may also preserve all manner of herbes, weeds, flowers, rootes, and the barkes or rindes of all manner of trees.

Preserving of
all smal seedes.

CHAP. 19.

How to keep Grain, either for transportation by Sea, or for use in a Town of War or Garrison, from one yeare to one hundred and twenty.

TO speake of the Graines and Pulses which are meetest for the Sea, and their severall uses.

R z

It

The use of
grain & pulse
at Sea.
Of Rice and
the use.

It is to be understood, that the best and principallest Graine which is indeed both most sweet, most fresh, most pleasant in taste, and most long lasting, is Rice, which although it grow not much in our Kingdom, but that we are beholden to our good Neighbours for the trade thereof, yet it is in such plenty where we fetch it, that we need neither complain of the scarcity nor the cost, and so much the rather in that a peck thereof will goe further then a bushel of any other Grain: Of this Rice is made many good and wholesome dishes, some thick, some thin, some baked, some boyled, as thus: If you take a quarter of a pound of Rice, and boyle it in a pottle of water, till it come unto an indifferent thicknesse, and then put into it a good lump of potted or barrellled butter, and as much sugar as shall salt-wile season it to an indifferent sweetnesse, it is a dish of meat meet for an Emperour at Sea, wholesome, good, and light of digesture, and will be as much as four reasonable men can well eat at a meal; for the nature of the Rice is such that it will swell in boyling, and grow to that bignesse, that in an instant it will thicken a pottle; some use the night before they boyl it, to steep it in so much water, as will onely cover the Rice all over, and then the next day boyl it in a pottle of water or more, and the Rice so steeped will so swell, that all the first water will be drunk up, and a great deal of lesse boyling will serve to make it ready, and sure then this a man cannot find a cheaper way to feed men, since one pint of water, and the forth part of a quarter of a pound of Rice (which come not to above half a penny at the dearest reckoning) is a meal sufficient for a mans eating, having Bisket and Drink proportionably. And this dish of meat being thus thin boyled, is called Sea Lob-lolly, and after salt feeding is wondrous wholesome and comfortable to any man, whether he be sick, found or diseased, and both abateth infirmities, and hastneth the healing of all wounds.

There be others, that after they have steeped this Rice (as aforesaid) do then boyl it in like manner, till it be so thick that a spoon may stand upright in it, and no liquidnesse of the water perceived; then put a good lump of butter into it, and boyl it with it, and stirre it about, and it will make it come most clean out of the pot in which it is boyled; then season it with

Sugar

Sugar, and a little Cynamon, and it will be a dish of meat right good and delicate, and meet for any man of what qualitie soever, that is worth goodnesse or preserving, nor need the quantitie exceed the proportion already prescribed.

Again, if you have meal in the ship, if you take of this Rice steeped in water, and a little lightly boyled and seasoned with Sugar, Cinamon, and Ginger, and a good quantity of Butter, and then bake it in little pasties, you shall find it a most delicate, pleasant, and wholesome meat, and that a penny in it shall goe further and give better contentment then four penniworth of Beefe, Bacon, Fish, or any other hard salt meat; yet I doe not wish any man of shipboard to make this a continuall feeding dish, for it is both too pleasant and too strong, and where evacuation of some umors are wanting, may breed inconveniences in strong bodys; but rather to use it once a week as a physicall nourisher, or for the comfort of sick and diseased men, whose stomackes are tane away, or else weakened; there may be also made of this Rice in time of necessity (being ground to a fine meale) an excellent good Bread or Ruske, which is pleasant, sweeter, and much longer lasting then any made wheat, or any other Grain whatsoever, besides many other Seeds which would in this place shew but too much curiosity to repeat.

The next Grain unto Rice, which is of estimation and great service at the Sea, is wheat, of which although there be divers kinds, yet they are all alike for the serving of this purpose; onely the large and thick huld wheat (being well dried) wil last the longest, but the small and fine skind wheat yeelds the purer flower and makes the better meal: now of this wheat is made divers dishes of meat, for some do take it, and bruise or beat it in a bag till the upper Skin be beaten off, and then having drest and winnowed it, boyl it in cleane water till it burst, and grow as thick as pap; then tak it from the fire, and being hot, put it into several dishes of wood, or traies, so much in every dish or tray as may serve four men, and so let it cool, then give it to the sick or sound as you shall be directed, and it is an excellent good meat, either cold or else hot, and a little butter melted with it, or being again boyled in fresh water, and seasoned with salt and a little Sugar, it makes an excellent Grewel, or lob-lolly, which is very sover-

Wheat, and
the use.

raign at Sea. Also your parched Wheat is a very good food at Sea, and of much request and estimation, being sprinkled with a little salt; and of this food a little will serve a man at a time, by reason that the much sweetnesse thereof soon filleth and cloyeth the stomack, yet it is wondrous light of digestion, and breeds great strength, and much good blood, as we daily find by experience.

Of Oatmeal
and the use.

The next Grain unto this which is to be recommended to the Sea (and which is indeed not any thing inferiour to either of the other going before, both for strength and lasting) is Oatmeal, which by reason of the great daynesse, and drying thereof, feels little or no imperfection at the Sea, as being unapt to sucke or draw in any of the ill or moist vapors thereof. Of this Oatmeal is made many good, fresh, and comfortable meates at Sea, as Grewell, or Lob-lolly, by boyling it in fresh water, and seasoning it with Salt, and (if you have it continually) sometimes with Sugar and a few Currants, and a little Mace, which is meat of great strength and goodnesse, especially for such as are sick and weak; for it is a great restorer of nature, and a purger of the blood; also to steepe the whole Grots of Oat-meale a night in water, and then draying them, and putting it into a bag, boyle it till the Grots break; then putting it out of the Bag, butter it with butter, and it is an excellent food; also boyling Oatemeale in fresh Water with Barme, or Dregges, and hinder ends of your Beer-barrells, makes an excellent good pottage, and is of great use in all the parts of the West Country, especially, where Marriners or Sea men live, and are called by the name Drousson pottage. Also, of Oatmeal is made that meate which is called in the West, Washbrew, and may be made at the Sea at your pleasure, being a meate of that great account amongst *Devonshire* and *Cornish* men that they will allow it no parallel; and for mine own part I have heard a most famous and well learned Physitian in those parts allow it to be a meate of singular great strength and goodnesse, and withall so light of digestion, that a man can very hardly surfeit upon it at any time; and I am the rather induced to believe the same, because I have observed and seen many of the

the labouring men of that Country to eate such an unmeasurable quantity thereof, that in mine eye one mans Supper would have served a whole Family.

But you will say, Hunger and Labour are such excellent Sawce, that they digest any thing.

To that I answer, that I have seen Gentlemen and Gentlewomen of that Country, of whom as much curiosity hath attended, as is lyable to the City, nay such as have had sicknesse their best familiar, yet eate of this with great and sharp appetite, and when health was most to be feared, then to boast of most soundnesse. This *Washbrew* is to look upon like Painters Size, or new made Jelly, being nothing but the very heart of the Oate-meale, boyled and drayned to that height and thicknesse, having neither Hull nor bran in it, but the pure Meale and Water, and it is to be eaten either with wine, strong bear, or ale, or with clarified honey, according to mens stomacks or abilities. Now this the eaters thereof affirm, that by no meanes it must be chewed, but rather swallowed by the spoonful whole, because chawing like a pill makes it taste unpleasantly. There is again another meat to be made of Oat-meal, which is called Girt-brew, and is somewhat more course, and lesse pleasant then Wash-brew, having both the branne and huls in it, yet is accounted a food of a very good strength, and exceeding wholesome for mans body, and of my knowledge much used and much desired of all labouring persons that are acquainted with it: Many other foods there are to be made of Oat-meal, but these shall be at this time fully sufficient.

The next Graine to this I account barley, which may be every way used like unto wheat, either to make grewel, to be creyed, parcht, or boyled: and for Barley for this purpose of food, the best is French barley, the next is barley-big, or Bear-barley, and the worst are the spice or battledore barley, and our common *English* barley.

And as barley or Wheat, so may you use your bucke, and your *Indian Siligo*, for they are of like nature, only they aske a longer time in their beating, steeping, and boyling, because they are naturally more hard and more dry, by reason of the

heate.

heat of the Climate in which the best grow; and it is ever to be observed for a rule, that the dryer you keep your Corn at Sea, the better it is, and sweeter and longer lasting.

Of pulse, and first of beans, the use.

Now having shewed the use of these lighter grains, I will come to Pulse, and shew their use and benefit at Sea, or in besieged towns: and of pulse, I will first speak of beanes as a principall food, wholesome and strong, and though not so fine and light of digestion as any of the former, yet exceeding hearty and sound and a great breeder of good blood: They are for the most part to be boyled whole, till such time as they appear soft and tender, or begin to breake, and then drained from the water are served in trayes, and well salted, and so eaten; a pottle whereof is thought a full proportion for four men: and of these beanes there are divers kinds as the common garden bean, or the French bean, which is great, broad, and flat, and these are the best to boyle, either with meat, or by themselves, and ask the least labour, because their outer skin is most tender and the inward substance most apt to be mollified and softened: they may also be boyled both when they are young and green, and when they are old and dry, and the meat at both times is good and savory.

The French bean.

The Kidney bean.

The next beane to these are the kidney beane, which is flatter and lesser, and neerer the proportion of a kidney then the French bean is, and this is also a garden beane, & whilst it is yong and green is to be eaten sallet wise after they are boyled, both the cod and bean together, and it is certaine a better sallet cannot be tasted; for the cod or husk is every way as excellent in tast as the bean is; but after they grow old and dry, and that the moysture is gone out of the cod, then it is meet to thrash them, and boyl them like the French beane, and they are every way as good meat and as soon boyled and as tender.

Common field beans, the use.

The next bean to these are your common and ordinary field beanes, which having tough and hard skins, ask more boyling then the other beanes, and are somewhat harder in tast, yet a good sound food also: there be many that parch them in the fire, and think them then best meat; because the fire sooner breaks the Skin and softeneth the kirknell; but they cannot be done so abundantly, and therefore are not so much in use.

Of pease and the use.

After this great sort of pulse, I will now speak of the smaller sort,

fort, as pease and their like; and of pease there be two kinds, the Garden pease, and the field pease, and for this use (albeit both are very good) yet the Garden pease are best, for they are soonest boyled and are most tender, and serve for most use, as for pottage boyling, parching, speling; and of these Garden pease, there are divers kinds, as white pease, French pease, haltings, rounsvalls and such like, the first being the longest lasters, the second the pleasantest in tast, the third the earliest and tenderest, and the last largest and fullest.

The field pease are onely of two kinds, as the white pease and the gray pease, and they seldome make pottage, because they are unapt to break, but are onely for boyling and making of leap pease, or for parching, yet a good and a strong food: and as we use pease, so in other countries they use Lupins, Lentils, tares, fetches, and such like smaller pulse, but they are neither so good, wholesome, nor savourie in tast, being a kind of graine more rank, fulsome, and breeding of ill blood and infection within: these in cases of Sea-fare and war-fare, ought principally to be eschewed and shunned.

Now it resteth after this long digression of these severall graines, and their uses, with the meats and profits which are made of them, that we come to the safe manner of keeping and preserving them either by land or water, for victuall or transportation, so as they may last and indure without ill smell or rottenesse.

And first for transportation of graine by Sea, it is two waies to be done, as either in great quantities for trade and the victualling of other nations, or in smaller quantity for victualling the men in the ship, prepared for a long and a tedious voyage.

For the transporting of Grain for trade in great quantities, it is to be intended the voyage is seldome long, but from neighbour to neighbour, and therefore commonly they make close deckes in the ships to receive the grain, fair and even boarded, yet if such decks be matted and lined, both under, and on each side; it is much the better, and this matting would be strong and thin. There be some which make the decks onely of mats, and sure it is sweet, but not so strong as the boards: therefore the best way of transportation, is to have strong boarded deckes well

matted; and then spreading the corne of a reasonable thicknesse, to cover it with matting again, and then to lay corn on it again, and then mats again, that between every reasonable thicknesse of Grain a mat may lie, the profit whereof is, that when the Corn with his own heat, and the working of the Sea shall begin to sweat, which sweat, for want of aire to dry it up, would turn to putrifaction.

Then these mats thus lying between, will not onely exhale and suck up the sweat, but also keep the Corn so cool and dry, that no imperfection shall come unto it. And here is to be noted, That these mats should rather be made of dry white bents, then of flags and bulrush; for the bent is a firm, dry crispe thing, and will not relent or sweat of it self, but the flag or bulrush is a spongy and soft substance, which is never empty of his own and other moystures.

Transporting
of victuals.

Now for transporting of grain, for Victualls for the shippe, which is in much smaller quantity, because it is but for the private use of a few within the ship; the onely best and safest way, is, to take Salt-fish barreles, or any Caske in which any Salt-fish hath been piled, as Cod, Herrings, Salmon, Sprats, or any other powdred Fish; and whilest the vessells are sweet, you shall calke them both within and without with plaister, daubing them al over; then into them put your Grain of what kind soever it be, and head them up close, and then stow them in such convenient dry place of the ship, as you shall think fit, and questionlesse, if beliefe may be given to the worthiest authors which have writ in this kind, you may thus keep your Grain sweet, sound, and in full perfection from one year to an hundred and twenty years; but certainly daily experience shews us, that all kind of Grain thus put up and kept, will remain sound and sweet, three, foure, and as some say, seven years, for so far hath lately been try'd: and what here I speake of ship-boord, the like may be done in any town of war or Garrison, whether besieged, or not besieged, or in any other place, where any necessity shall compell; the proof of this manner of piling or putting up of Grain, serveth as well for Land as Sea.

CHAP. 20.

The enriching of all manner of barren Grounds, and to make it fruitfull to bear Hops.

THE Hop of all plants is the most tender, and can endure neither too rich a ground, nor yet too poor, for being planted in the first, it bringeth forth onely leaves and no bels, and in the latter yeeldeth neither leaves nor bels.

Now in the first sort of ground, which is fertile and rich, I have nothing to do but onely to advise how you may allay and lessen that too much fatnesse, by mixing your hills well with Chalk, or small sharp gravell; if it be a hassell or mix'd mould, and with good store of red sand if it be a stiffe clay, for either of these mixtures will in short space abate any fertility.

Abating fertility.

But if the soyle be contrary to this that is extreame barren, then you shall seek by these meanes following to encrease the fertility. First when you have taken view of that barren earth, which you intend to convert to a Hop-garden, you shall first look to the situation thereof, whether it lye high or low, whether it be subject to inundations or drownings, or that it lye safe and free from any such annoyance: If it be subject to great and deep overflowes, then it is no ground for this purpose; but if it be onely liable but to some small washings, then you may by a few small drains & sewers cast through your allies, convey away the water to some lower grounds, so as it may not continue long in the Gardens to do hurt. Besides, for a further safety to the Hop, you shall make your hills a great deal bigger and higher, that when any overflow shall happen. The water may not reach above the mid part of the hill at the most, for the root may endure moystning, but not drowning; and this water thus running through the alleys, and not drowning, the root will bring to the ground very much fertility. But how soever after you have cat'd your ground of these particular faults, yet the generall fault, which is barrenesse, will remaine still: therefore, having plotted out your Garden, and fenced it sufficiently about, you shall then cast up your hills about Michaelmas, placing

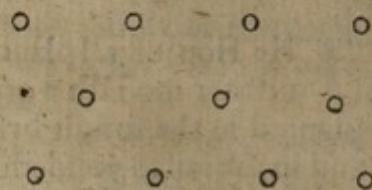
Increasing of fertility.

Choice of Earth.

Draining water.

Casting of
hills and allies.

them in a very orderly manner, and making allies between them of four or five foot bredth between hill and hill, so as a man may walk at pleasure through and about them: neither shall these hills stand all directly bee hind another, for so one will overshade another, which is an annoyance, but according to this Figure, where there is a largenesse of space, and a by-passage, through which the Sunne may come to give comfort to every Plant.



These hills, if the ground be free from water, may be raised about two foot, or a foot and a halfe high, and of a compasse answerable to the height; neither so little, that the hill may be sharpe like a Sugar loafe, nor yet so bigge, that the hill may lie flat, and so retaine and hold any rain or wet, which shall fall upon it; but you shall keep a due middle proportion, making the hill convenient for your Plants and Poales, and so as it may shoot or put off any wet, or other annoyance, which shall fall upon it.

The composition
of the
enriching of
hills.

Now these hills you shall not make intirely, all of one mould, but you shall take, as it were, a third part or better thereof, then another part of the earth which lieth under dung-hills, and the last part of the Sope-ashes, and these three bodies you shall mixe equally together, and of them compound your Hop-hills: but if this seeme somewhat difficult, and that you cannot find enough for your purpose of either of these manures, then you may take three parts of the naturall earth, and but one-ly a fourth part of the other two, and thereof mixe your Hop-hills, and it will be sufficient to afford you profit enough; provided you be able once in three or foure yeares to renew it, for so long this will last in full strength and power.

Preparing of
the allies.

When you have thus made up your hills, you shall then pare up with a paring shovell all the greene swarth quite through all your allies at least four fingers thicke, and with the swarth so^e pared up, you shall cover all your hills almost to the top, turning the green swarth next unto the earth, so as it may rot, for that is an excellent manure also: then when your allies are all thus

thus cleanted of their twarth, you shall take good store of braken or ferne, and strow it all over quite thorow all the allies, so that it may lie in a good thicknes, almost to the midst of the hills, which having all the winter to rot in, will not onely be an exceeding comfort to the hills, and preserve both them and their plants from many evils, but also being shovelled up together with the earth in the spring time, will be a marvellous strong manure wherewith to replenish the hills, and to make them to prosper exceedingly, and to save much other cost and charges as well in manure as in carriage.

When your hills are thus enriched, and your allies thus prepared, you shall then open your hills in the top, and set your plants, that is to say, in every hill four plants at the least, being well prepared; and this should be done in the month of October, and these plants must be set good and deepe in the earth, and covered all over, at the least four fingers thick: and if with the earth which covereth these Plants you mixe Oxe-blood and Lime, it will not onely give great comfort and nourishment to the Plants, but also defend and save the roots from wormes and other vermines, which otherwise would seek to destroy them.

The planting
of hops.

After your Garden is thus planted all over, you shall then let it rest till the following Spring, and about *Aprill*, finding the small Twines of your Hopps issued out of the Hills and running alongst the ground, you shall then set up your Poles, which Poales so they be long and streight, may be of any wood you please, as either Ash, Elme, Withy, Willow, or Sallow, and in the setting up of these poales, you shall have two very carefull respects: First, that in putting in of the poales, and fastening them with the earth, you do not hurt the Hop-rootes, which a small carelesnes may doe, but be sure to set them clear at the roots: and that you may doe it the better, and make your poles to stand the faster, it is good that you have an iron auger, therewith first to pierce the ground, and then to put the pole in after, and so ram it in hard that it may not stirr. The second care is that you place not one poal to overshadow another, but that they may stand so clear one from another, that which way soever the Sun shall cast his beams, yet every plant (as it winds about

Poling of
Hops.

the poale) may be an equall partaker of the same.

This, with a small observation in the setting up of the poales may easily be performed: the number of poales that you shall set on every hill, must be answerable to the Syens which shall issue from the roots, allowing to every poal two Syens at the least, and not above three at the most: these Syens (when your hills are poled) you shall with your hands twine about their severall poales, and those which are but new peeping from the ground, you shall so fold among the other Branches, as they may of themselves run about the poal; and as these, so also all the other twigs, which are any way derived from the main Sien, leaving not any at all to run upon the ground; for that is altogether profitless, and to no use.

Of weeding
Hops.

For the weeding of this barren earth thus made into an hop-garden, there is little care to be had: for first the sope ashes wherewith the hills are manured, the oxe blood and the lime, are such enemies to all manner of weeds, that they will not suffer any to grow where they abide: Next, the Braken and Fern, which covereth the alleys is such a poysoner and smotherer of any thing that shall grow underneath it, that it will not suffer any weed to peep or spring up through it; yet if in any especiall place where neither of these defences come, it happen that any weeds doe grow, then you shall with your best care cut them away, or pull them up, and so your Garden shall remain comely, pleasant and fruitfull to every prospect.

CHAP. 21.

A generall computation of men, and cattels labours: what each may do without hurt daily.

Plowing and
sowing.

TO speak generally of all husbandly works, where the Country is tollerable without any extraordinary difficulty, you shall understand, that a man may well in stiffe ground, plow an Acre, or an Acre and an half, and in light sand grounds two or three Acres with one Teame in a day, and he may plow and sow in stiff ground two Acres and sn half each day, and in light ground four at least with one Teame; and alwayes what he soweth, that he may harrow the same day also.

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A man may well mow of good and deep loggy meadow, or of rough, uneven meadow, every day one acre; mowing clean and making a smooth board; of well standing and good smooth meadow, an acre and a half each day: and of very thin and short grasse, or upland meadow, two acres at the least every day.

Also, he may mow of corn, as Barley and oats, if it be thick, loggy, and beaten down to the earth, making fair work, and not cutting of the heads of the ears, and leaving the straw still growing, one acre and a half in a day: but if it be good thick and fair standing corn, then he may two Acres, or two Acres and a half in a day; but if the corn be short and thin, then he may mow three, and sometimes four Acres in a day, and not be overlaboured: Also of beans he may mow as much, and of Pease mixt with beans, having a hook to follow him, no lesse; for they are works in this nature most easie, and least troublesome.

One man with a binder may well reap an Acre of Wheat or Rye in a day, if it be principall good and well standing, but if laid or beaten down with weather, then three rood is fully sufficient for a days labour; but if it be thin and upright standing, then he may reap and bind five roods in a day: of small pease, Fetches, and such like, a man may well reape two acres every day.

Now forasmuch as it is a custome in divers countries (and truly is exceeding profitable and worthy in imitation) to sheafe and bind up both Barley and Oates, as well as Wheat or Rye, and that both saveth much Corn, and also makes it take a great deal lesse room, and that this labour is to be done after the mowers, as the other was after the reapers, by gathering the barley, or Oats up without a sickle or hook, as it lies in the swath, and so binding it in sheaves, you shall understand that one man in a day shall bind as much as one mower can mow; and if the man be any thing skilfull in the labour, two binders will bind as much as three mowers can mow.

For the gathering or inning of Graine, no man can proportion the number of loads; or quantity of ground shall dayly be brought home, sith the journeyes are uncertaine; some going

Mowing.

Reaping.

Binding of
Barley and
Oats.Gathering in
of Grain.

a mile, some half a mile, and some a mile: therefore it is the Husbandmans best way, the first day to go with his Teame himself, and both to observe the labour and distance of place, and by that to compute what may be done after, without hurt to his cattle, and where he fails of any hope, there to make a strict account of the error; for it is either ignorance or carelesness which brings forth mischances, speaking of husbandry, as overthrowing the Team, over-loading the Team, breaking necessary instruments, or not respecting the wayes and passage, any of which may in a day hinder more than half a dayes labour

Ditching.

Again, a man may in a day ditch and quickset of a reasonable ditch four foot broad, and three foot deep, a rod or a pole a day, allowing sixteen feet to the rod, and so of large measure less ground, and of less ground larger measure, according to the sufficiency of the fence which you purpose to make.

Hedging.

A man may hedge also in a day, if the hedge be good and substantiall, that is to say five foot high, well bound, thick stackt, and close layd, two rod in a day, and if the work be lower or thinner, then double so much much, according to the former proportion.

Plashing.

For this plashing of hedges, or making a quick fence if he doe it workmanly, and that the growth be high and well growne, and then he lay it thick, close, and strongly bound in the top; turning the quick downward and inward, to plash a rod a day, is as much as any man can well do; but if ye plash it after the west cuntry fashion, that is, only cutting it down, and laying it along close to the ground, seeking onely thickness, and not much guard or comelineffe, then he may well plash a rod and a halfe a day without trouble: and sure in this work is great care and art to be used, as well for the preservation of the quick, as the goodnesse of the fence, being a thing of worth and validity to every Husbandman.

Delving.

Againe, a man may delve or dig, as for garden-mould, Hemp-yard, Flax-yard, or for the setting of corn, or levelling of uneven places, one rod in a day, and the ground so digged and delved, he may rake, dresse, and levell in the same day also, but if he dig it deep, and trench it, and manure it, as is meet, either

er for Garden, Orchard, or corn setting, then to delve half a rood in a day, is a very great proportion, because ordinarily to delve, as to receive ordinary seeds, requires but one spade graft in depth, but extraordinarily to delve, as for enriching and bettering of the ground, and to cleanse it from stones, weeds and other annoyances, will require two spade graft at the least.

Lastly, a man may thrash if the corn be good and cleane, without some extraordinary abuse or poverty in the grain, in one day four bushels of wheat or Rye, sixe bushels of Barly or Oats, & five bushels of beans or Pease, but the pulse must then be imagined to be exceeding good, otherwise a man shall thrash lesse of it, then of any other kind of grain: for as when it is wel loaden, it yeeldeth plentifully, so when it is poor and lightly loaden, it yeeldeth little or nothing, and yet hath not one stroke lesse of the flaile, nor any labour saved more then belongs to the best pulse whatsoever, being ever at least three times turned, and four times beaten over.

Threshing.

Having thus generally run over (in a short computation) the labours of the Husbandman, I will now briefly as I can, goe over the particular daies labour of a Farmer or Plowman, shewing the particular expence of every houre in the day, from his first rising, til his going to bed, as thus for example: we will suppose it to be after *Christmas*, and about plow-day (which is the first setting out of the plow) and at what time men either begin to fallow, or to break up Pease-earth, which is to lye to bair, according to the custom of the Country; at this time the Plowman shall rise before four of the clock in the morning, and after thanks given to God for his rest, and the successe of his labours, he shall go into his stable, or beast-house, and first he shall fodder his cattle, then cleane the house, and make the booths cleane; rub down the cattle, and cleanse their skins from all filth, then he shall curry his horses, rub them with cloaths and wisps, and make both them and the stable as clean as may bee, then he shall water both his oxen and horses, and housing them again, give them more fodder, and to his horse by all means provender, as chaffe and dry pease or beans, or Oat-hulls, pease or beanes or clean oats, or clean Garbadge (which is the hinder ends of any Grain but Rye) with the straw chopt smal amongst it according

The particular expence of a day.

T

ding

ding as the ability of the Husbandman is.

And whilest they are eating their meat, he shall make ready his Collers, Hames, Treates, Halters, Mullens, and Plowgeares, seeing every thing fit, and in his due place, and to these labours I will also allow full two houres, that is, from foure of the clock till fixe; then shall he come in to breakefast, and to that I allow him halfe an houre, and then another halfe houre to the gearing and yoking of his Cattle, so that at seven of the clock he may set forward to his labour, and then he shall plow from seven of the clock in the morning, till betwixt two and three in the afternoone; then he shall uny oak and bring home his cattle, and having rub'd them, drest them, and cleansed away all dirt and filth, he shall fodder them and give them meat; then shall the servants goe in to their Dinner, which allowed halfe an houre, it will then bee towards foure of the clock, at what time he shall goe to his cattle againe, and rubbing them down, and cleansing their stalls, give them more fodder; which done, he shall goe into the Barns, and provide and make ready fodder of all kinds for the next day, whether it be hay, straw, or blend fodder, according to the ability of the husbandman.

This being done and carried into the stable, oxe-house, or other convenient place, he shall then go water his cattel, and give them more meat, and to his horse provender, as before shewed: and by this time it will draw past six of the clock, at what time he shall come in to supper, and after supper, he shall either by the fire side mend shooes both for himself and their Family, or beat and knock Hemp or flax, or pick and stampe Apples or Crabs, for cider or verdjuice, or else grind malt one the quernes, pick candle rushes, or do some Husbandly office within doores till it be full eight a clock: Then shall he take his Lanthorn and Candle, and go see his Cattel, and having cleansed the stalls and planks, litter them down, look that they be safely tyed, and then fodder, and give them meat for all night; then giving God thanks for benefits received that day, let him and the whole household go to their rest till the next morning.

Now it is to bee intended, that there may be in the Household

Houſhold more ſervants then one; and ſo you will demand of me what the reſt of the ſervants ſhall be employed in before and after the time of plowing: To this I anſwer, that they may either goe into the Barne and thrash, fill or empty the malt ſat, loade or unloade the Kilne, or any other good and neceſſary worke that is about the yard, and after they come from plowing, ſome may goe into the Barne and thrash, ſome hedge, ditch, ſtop gaps in broken Fences, dig in the Orchard or Garden, or any other Out work which is needfull to be done, and which about the Husbandman is never wanting, eſpecially one muſt have a care every night to looke to the mending or ſharpening of the Plow-irons, and the repairing of the Plow and Plow geares, if any be out of order, for to defer them till the morrow, were the loſſe of a dayes worke, and an ill point of Husbandry.

Particular labors of cattel.

Now for the particular labours of Cattell, though it be already incluſively ſpoken of in that which is gone before, where I ſhew you how much a man may conveniently plow in a day with one Team or Draught of Cattell, yet for further ſatisfaction, you ſhall underſtand that in your cattell there are many things to be obſerved, as the kind, the number, and the ſoyle they labour in. For the kind which are Oxen, Bulls, or Horſes, the beſt for the draught, are Oxen, and the reaſons I have ſhewed in my former Works: the next are Horſes, and the worſt Bulls, becauſe they are moſt troubleſome; the number fit for the plough, is eight, ſix, or foure; for the cart, five, or foure; and for the Waine, never under ſix, except in leading home of harveſt, where loading eaſily, foure very good oxen are ſufficient; for the ſoyle, if it be of the toughelt and deepeſt earth, eight beaſts can doe no more but fallow or breake up Peaſe-earth, no, nor fewer ſtirre, if the ſeaſon grow hard and dry; for ſoyling, winter rigging and ſeed furrow, ſix beaſts may diſpatch that labour: if the ſoyle bee mix'd and haſſel, then ſix may fallow and ſow Peaſe, and foure doe every other ordure: but if it be light and eaſie ſand, then foure is enow in every ſeaſon. For the quantity of their worke, an Oxe-plough may not doe ſo much as a Horſe-plough, becauſe they are not ſo ſwift, nor may be driven out of their pace, be-

ing more apt to surfet then horses bee, so that for an Ox-plough to doe an Acre, and a Horse-plough an Acre and a Rood, or an Acre and an halfe in good ground, is works fully sufficient.

CHAP. 22.

The applying of husbandry to the severall Countries of this Kingdome, wherein is shewed the office and duty of the Carter or Plow-man.

IT is to be understood, that Husbandry doth vary according to the nature and climates of Countries; not one rule observed in all places, but according as the earth, the aire, the much or little heat, moisture or cold doth increase or diminish, so must the skilful Husbandman alter his seasons, labours, and instruments; for in stiffe Claves, as are all the fruitful Vales of this Kingdome (of which I have named most part in a Chapter before) as also Huntington-shire, Bedford-shire, Cambridge-shire, and many other of like nature, all manner of arable works must be begun betimes in the year, and the Ploughs and instruments must be of large size and strong timber, and the labour great and painful: so also in mixt-soyles that are good and fruitful, as Northamptonshire, Hartfordshire, most part of Kent, Essex, Barkshire, and Counties of like nature, all arable toiles would begin at latter seasons, and the Ploughes and instruments would be of middle size, and indifferent timbers, and the labour somewhat lesse than the other: but the light sandy grounds which have also a certain natural fruitfulness in them; as in Norfolk, Suffolk, most part of Lincolnshire, Hampshire, Surry, and Countries of that nature, all arable toiles would begin at the latest seasons, and the Ploughs and instruments would be of the smallest and lightest size, and of the least timber, and the labour of all other is easiest.

Lastly, for the barren unfruitful earth (of which onely I have written in this Book) as is Devon-shire, Cornwall, many parts of Wales, Darbi-shire, Lanca-shire, Cheshire, York-shire, and many other like, or worse than they; the arable toiles would have a fit season of the year, according to the temperatnesse of the year, which if it happen early, then you must begin your labours at later seasons.

ions, and for your Plough and instruments, they must not keep any certain proportion, but be framed ever according to the ground, the stronger and stiffer ground having ever the strong and large Plough with Instruments of like kind, and the lighter earth a Plough and Instruments of more easie substance: as for the labour it must be such, and no other, then that which hath been already declared in this Booke.

And hence it comes that the office and duty of every skillfull Plough-man, or Carter, is first to look to the nature of the earth, next to the seasons of the year, then to the customes and fashions of the place wherein he liveth: which customes although they be held as second natures amongst us, and that the best reasons of the best work-men commonly are, that thus I do because thus they do; yet would I wish no man to bind himselfe more strictly to custome, then the discourse of reason shall be his warrant, and as I would not have him to prejudicate in his own opinion, so I would not have him too great a slave to other mens traditions; but standing upon the ground of reason, made good by experience, I would ever have him profit in his owne judgement.

The Carters
office.

Now the further office and duty of the Husbandman, is with great care and diligence, to respect in what sort of fashion to plow his ground; for although I have in the former Chapter shewed how he should lay his furrowes, what depth he shall plow them, and how he shall be able to raise and gain the greatest store of mould, yet is there also another consideration to be had no lesse profitable to the Husbandman than any of the former; and that is how to lay your land best for your own profit and ease, as also the ease of your Cattel which shall draw within your draught; as thus for instance: If your arable land shall lye against the side of any steep hil (as for the most part all barren earths doe) if then you shall plow such land directly against the hill, beginning below and so ascending streight upright, and so down againe and up againe, this very labour and toiling against the hil wil breed such a bitter wearisomness to the cattel, and such a discouragement, that you shall not be able to compasse one half part of your labour, besides the danger of over-heating and surfeiting of your beasts, whence wil spring

many mortal diseases: Therefore when you shall plow any such ground, be sure ever to plow it side-ways overthwart the hill, where your beasts may tread on the level ground and never directly up and down, so shall the compost and manure which you lay upon the ground not be so soon wash'd away from the upper part of the ground, because the furrows not lying streight down in an even descent, but turned crosse-ways upward against the hill, it must necessarily hold the soyle within it, and not let it wash away.

Of cattell for draught.

Again it is the office of every good plow-man to know what Cattell are meetest for his draught; as whether Oxen or horse, or both Oxen and Horse; wherein is to be understood, that although of all draughts whatsoever within this Kingdome, there is none so good to plow withall, both in respect of the strength, stability, indurance, and fitnesse for labour, as the Oxen are, in whom there is seldome or never any los; because whensoever his service faileth in the draught, his flesh will be of good price in the shambles; yet notwithstanding in this case a man must necessarily bind himself much to the custome of the Country, and fashion of his neighbours; for if you shall live in a place where fuell is scarce & far to be fetch'd, as commonly it is in all barren Countreys, which, for the most part, are stony Champaines, or cold mountaines; and your neighbours as wel for the speed of their journies, as for length keep horse draughts: in this case also you must do the like, or else you shall want their company in your journey, which is both discomfort and disprofit, if any mischance or casualty shall happen, or being inforc'd to drive your oxen as fast as they doe their horse, you shall not onely overheat, tire, bruise, and spoil them; but also make them utterly unfit either for feeding or labour, and therefore if your estate be mean, and that you have no more but what necessity requires, then you shall sort your Plow or Teeme according to the fashion of your Country, and the use of your neighbours: but if God have blest you with plenty, then it shall not be amiss for you to have ever an Ox-draught or two, to til your Land; and a horse draught to do all your forraign abroad busineses: so shall your work at home ever goe constantly forward, and your outward necessary provisions never wanting. Now for

for the mixture of Oxen and horse together, it falleth out oftentimes that the Plowman of force must be provided with cattle of both kind, as if he happen to live in a rocky Country, where the steepnesse of the hills, and narrowness of the wayes, will neither suffer Cart, Wain, nor Tumbrel to passe; in this case you shall keep Oxen for the plow, to till the ground with, and horses to carry pots and hooks: the first to carry forth your manure, and the other to bring home your hay and Corn harvest, your fuel and other provisions, which are needfull for your family, as they do both in Cornwall, and other mountainous countries, where carts and wains, and such like draught, have no possible passage.

Again it is the office and duty of every good Plow-man to know his severall labours, for every severall Month through the whole year, whereby no day nor hour may be mispent, but every time and season employed according as his nature requireth: as thus for example.

January.

In the month of January the painfull Plowman, if he live in fertile and good soyles, as among rich, stiff, simple clayes, he shall first plow up his Pease earth, because it must lie to take bait before it be sown; but if he live in fruitfull well mixt soyles, then in this month he shall begin to fallow the field he will lay to rest the year following; but if he live upon hard barren earths (of which chiefly I write) then in this moneth he shall water his meadowes & pasture grounds, and he shall drain & make dry his arable grounds, especially where he intends to sow pease, Oats, or Barley, the seed time following. Also he shall stub up all such rough grounds as he intends to sow the yeer following, and shall measure and trim up your Garden moulds, and you shall comfort with manure, sand, or lyme, or all three mixt together, the roots of all barren fruit trees: and also cut down all such timber; only there will be losse in the bark, for the time is somewhat too early for it to rise. Lastly, you may transplant all manner of Fruit trees, the weather being open, and the ground easie: you may rear Calves, remove Bees, and for your own health keep your body warm, let good diet and wholesome be your Physitian, and rather with exercise then sauce encrease your appetite.

In.

February.

In the month of February, either set or sow all sorts of Beanes, Pease, and other Pulse, and the stiffer your ground is, the sooner begin your work; prepare your garden mould and make it easie and tender; prune and trim all sorts of Fruit trees from mosse, cankers, and all superfluous branches; plash your hedges, and lay your quicksets close and intire together; plant Roses, Gooseberries, and any fruit that grows upon little bushes; graft at the latter end of this moneth upon young and tender stockes, but by all meanes overlade not the stocks.

Lastly, for your health, take heed of cold, forbear meats that are slimy and phlegmatick, and if need require either purge, bathe, or bleed, as Art shall direct you.

March.

In the moneth of March, make an end of sowing of all sorts of small Pulse, and begin to sow Oats, Barley, and Rye, which is called March-rye; graft all sorts of Fruit trees, & with young Plants and Syens replenish your Nursery, cover the roots of all trees that are bared, and with fat earth lay them close and warm: if any tree do grow barren, bore holes in the root, and drive hard wedges or pins of Oak wood therein, and that will bring fruitfullnesse: transplant all sorts of summer flowers, & give new comfort of manure and earth to all early outlandish flowers, especially to the *Crown Emperiall*, *Tulippes*, *Hyacinth*, and *Narcissus*, of all shapes and colours, cut down under-wood, for fuell and fencing, and look well to your ewes, for then is the principall time of yeaning.

And lastly, bathe often, and bleed but upon extremity, purge not without good counsell, and let your dyet be cool and temperate.

Aprill.

In the month of *Aprill*, finish up all your Barley seed, and begin to sow your Hemp and Flax: sow your Garden seeds, and plant all sorts of hearbs; finish grafting in the Stock; but begin your principall inoculation, for then the Rynd is most plyant and gentle: open your Hives, and give bees free liberty, & leave to succour them with food, and let them labour for their living.

Now cut down all great Oak-timber, for now the bark will rise, and be in season for the Tanners; now scour your ditches, and gather such manure as you make in the streets and high waies, into great heaps together; lay your meadows, sleight your
corne-

corne-ground, gather away stones; repaire your high water, set Oziers and Willows, and cast up the banks and mines of all decayed fences.

Lastly, for your health, either purge, bath or bleed; as you shall have occasion, and use all wholesome recreation: for, then moderate exercise in this moneth, there is no better Physick.

In the moneth of *May*, sow barley upon all light sands and burning grounds, so likewise do your Hemp and Flax, and also all sorts of tender garden seeds, as are Cucumbers and Melons, and all kind of sweet smelling herbs and flowers; Fallow your stiff clays; summer stir your mixt earth, and soyle all light and loose hot sands: prepare all barren earth, for Wheat and Rye, burn bait, stub gorse or Furs, and root out Broom and Fern; begin to fold your sheep, leade forth manure, and bring home fuell and fencing, weede your winter corne, follow your Common workes, and put all sorts of grasse, either in pasture or teather: put your Mares to the horse, let nothing be wanting to furnish the Dairy: and now put off all your winter fed cattell, for now they are scarcest and dearest; put yong Stears and dry kine now to feed at fresh grasse, and away with all pease-fed sheep; for the sweetnesse of grasse mutton will pull downe their prices.

Lastly, for your health, use drinke that will coole and purge the blood, and all other such physicall precepts, as true Art shall prescribe you: but beware of Mountebanks and old wives tales, the latter hath no ground, and the other no truth, but apparent cosenage.

In the month of *June*, carry sand, marle, lime, and manure of what kind soever to your land; bring home your coales and other necessary fuell fetcht farre off, sheare early fat sheep; sow all sorts of tender hearbs, cut rank low meadows, make the first returne of your fat cattle, gather early Summer fruits, distill all sorts of plants and hearbs whatsoever.

And lastly, for your health, use much exercise, thin dyet, and chaste thoughts.

In the month of *July*, apply your hay harvest, for a day

flacke is many pounds lost, chiefly when the weather is unconstant

stant, sheare all manner of field sheep, Summer stir rich stiffe grounds, soil all mixt earths, and latter soil all loose hot sands. Let hearbs you would preserve now run to seed, cut off the stalks and outlandish flowers, and cover the roots with new earth so well mixt with manure as may be; sell all such lambs as you feed for the butcher, and fill lead forth sand, marle, lime, and other manure; fence up your copes, graze your elder under woods, and bring home all your field timber.

And lastly for your health, abstain from all physick, bleed not but upon violent occasion, and neither meddle with wine, women, nor other wantonesse.

August.

In the month of August, apply your Corne harvest, shear downe your wheat and Rye, mowe your barley and oats, and make the second returne of your fat sheep and cattle; gather all your Summer greater fruit, plumbs, apples, and peares, make your summer, or sweet perry and cidar; set slips, and syens of all sorts of Gilly-flowers, and other flowers, and transplant them that were set the spring before, and at the end of this month begin to winter-rig all fruitfull soyles whatsoever. Geld your lambs, carry manure from your dove-coats, and put your swine to the early or first mast, and lastly for your health, shun feasts and banquets. Let physick alone, hate wine, and onely take delight in drinks that are coole and temperate.

September.

In the month of September, reap your pease, beans, and all other pulse, making a finall end of your harvest; now bestow upon your Wheat land your principall manure, and now sow your Wheat and rye, both in rich and in barren climates; now put your swine to mast of all hands, gather your winter fruit, & make sale of your wooll, and other summer commodities; now put off those stocks of bees, you mean to sell, or take for your owne use, close thatch and dawbe warme all the surviving hives, and looke that no drone, Mice, or other vermine be in or about them; now thatch your stacks and reeks; thrash your Seed Rye, and Wheat, and make an end with your cart of all forraigne journeyes.

Lastly, for your health, in this month, use physick, but moderately, forbear fruits that are too pleasant or rotten, and as death shun ryot and Surfeit.

In

In the month of October, finish up your wheat seed, and scour October. ditches and ponds, plash and lay hedges and quickset, transplant, remove, or set all manner of fruit trees, of what nature or quality soever, make your winter Cider and perry, spare your private pastures, and eat up your Corn fields and commons, and now make an end of winter ridging, draw furrows to draine, and keep dry your new sowne Corn, follow hard the making of your malt rear all such calves as shall fall, and wean those foals from your draught mares, which the spring before were foaled: now sell all such sheep as you will not winter, give over folding, and separate Lambs from the Ewes, which you purpose to keep for your own stock.

Lastly, for your health, refuse not any needfull physick at the hands of the learned physician, use all moderate sports, for any thing now is good, which reviveth the spirits.

In the month of November, you may sow either Wheat or Rye November: in exceeding hot soiles, you may then remove all sorts of fruit trees, and plant great trees, either for shelter or shadow: now cut down all sorts of timber, for plowes, carts, axeltrees, naves, harrowes, and other husbandly offices, make now the last returne of your grasse-fed cattle; bring your swine from the mast, and feed them for slaughter, rear what calves so ever fall, and break up all such Hemp and Flax as you intend to spin in the winter season.

Lastly, for your health, eat good, wholesome, and strong meats, very well spiced and drest, free from rawnesse; drink sweet wines, and for digestion ever before cheese prefer good and moderate exercise.

In the month of December, put your sheep and swine to the December: Pease Reekes, and fat them for the slaughter and market; now kill your small porkes, and large bacons, lop hedges and trees, saw out your timber for building, and lay it to season: and if your land be exceeding, stiff, and rise up in an extraordinary furrow, then in this month begin to plow up that ground whereon you mean to sow cleane beans only; now cover your dainty fruit over trees with canvase, and hide all your best flowers from frost and stormes, with rotten old horse-litter; now drain all your corn-fields, and as occasion shall serve, so water and keep moist

your meadows: now become the fowler, with peece, nets, and all manner of Engins, for in this month no fowl is out of season, now fish for the Carp, the bream, Pike, Tench, Barbell, Peal and Salmon.

And lastly, for your health, eat meats that are hot and nourishing, drink good wine that is neat, sprightly and lusty, keep thy body well clad, and thy house warme, forsake whatsoever is flegmatick, and banish all care from thy heart, for nothing is more unwholesome, then a troubled spirit.

Many other observations belong unto the office of our skilfull Plowman or farmer, but since they may be imagined too curious, too needlesse, or too tedious, I will stay my penne with these already rehearsed, and thinke to have written sufficiently, touching the application of grounds, and office of the plow-man.

The end of Markham's farewell to Husbandry.

FINIS.

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ADDITION.

*An excellent way to take Moles, and to preserve good
 Ground from such annoyance.*

PUt *Garlick*, *Onions*, or *Leekes*, into the mouthes of the
 holes, and they will come out quickly as amazed.

FINIS.

