

OBSERVATIONS

Made by

Richard Hall,

OF THE

City of *DUBLIN,*

Hemp and Flax Dresser;

ON

The Methods used in *HOLLAND*, in Cultivating or Raising of *HEMP* and *FLAX*.

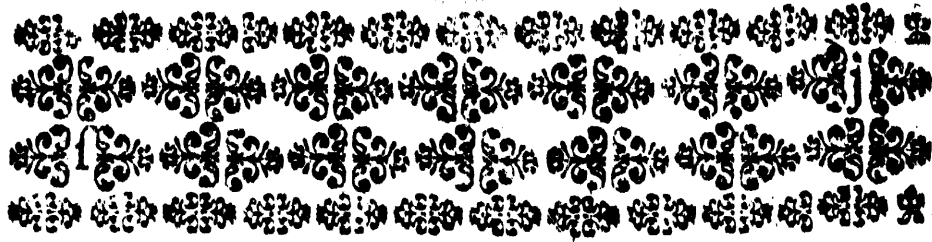
And Likewise,

His *REMARKS* on Mr *SLATOR*'s Books

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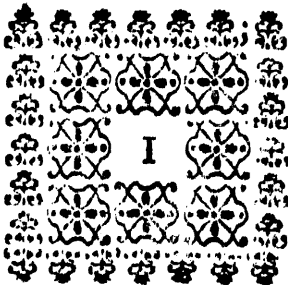
Richard Hall,

On the

Methods used in *HOLLAND*, in Cultivating
or Raising of *FLAX* and *HEMP*, &c.

S E C T. I.

Of the Choice of the Soil.


 IN the Province of *Holland*, there is a Country known by the Names of *Targou* and *Geuda*; it is there that they raise the best Hemp the *Dutch* are Masters of: The Soil is exceeding deep and rich. They frequently make use of *Ley-grounds* for sowing of Hemp in; yet do they not so far confine themselves in that Particular, but that they often continue to sow the same Soil with Hemp, for many Years successively, only every two Years they recruit their Soil thus, *viz.* When they have pulled their Hemp, they rake together all the Grass, Weeds, and Trash which they find on the Ground, and lay them in large Heaps to rot: These Heaps are made thus large, to the End the Sun may not exhale the Vertue from the Dung ere it is spread over their Hemp-grounds. And they also gather what Slush is wash'd from out of their Lands, into their Trenches or Ditches: This Slush they lay in Heaps, sometime in the Month of *August*, and there let it lie the whole Winter; only they turn it often with the Spade.

Ley-grounds.

Every two Years the Dutch recruit their Soil.

This *Targou* or *Gouda* is a large Country, and for near twenty Miles together, is exceeding fertile and proper for Hemp; which the State observing, they formerly gave great Rewards to the Boors, to induce them to be industrious in the raising of this useful Plant: But these Rewards were not of long Continuance; because the States soon perceived, that the Boors had their Accounts sufficiently answered by their Profits.

A Farmer or Boor in *Targou* or *Gouda* seldom sows more than two Acres with Hemp, and many of them less, that he may the better manure it; and also, that the pulling of the Hemp may not divert his Servants from their other Business.

S E C T. II.

Remarks on the Soil of Ireland, as to Hemp.

Land proper for Hemp
Corvus-lands.
Up lands
Up-lands of the County of *Limerick*
Up-lands last mentioned, ought to be frequently changed, for the Benefit and Advantage as well of the Husbandman as of the Publick:
Winter-plowings to be made for Hemp.
Corvus-lands.
Canal.

Ireland has great Quantities of Land proper for Hemp, especially in the Counties of *Limerick*, *Clare*, *Kerry*, *Tipperary*, and some Parts of other Counties. It is not to be expected, that the Lands in each of these Counties, should hold equally the one as the other. Doubtless the Corvus lands of the Counties of *Limerick* and *Clare*, which have been gain'd from the Sea this many Years, and are vastly rich, will stand longer under Culture, than even the Up-lands of the same Counties can. Likewise, the Up-lands of the County of *Limerick* are much more fertile, than the Generality of the other Lands of the Kingdom. Even those Up-lands last mentioned, ought to be frequently changed, for the Benefit and Advantage as well of the Husbandman as of the Publick: For since three Plowings must be made for Hemp, the Husbandman must be very much wanting to himself, that does not as soon as his Hemp is off the Ground, give it another Plowing, and sow it with Winter-grain.

The Corvus lands of the Counties of *Limerick* and *Clare* are violently hot, and therefore apt to throw up large stalk'd Hemp, which never skins so well as the minding Hemp of five Foot high: Yet I am of Opinion, that if these Grounds were successively sown with Hemp for some Years, their Fire would soon abate, so as they might be brought to yield Hemp nothing inferior to the *Dutch*; provided they were as skillfully and diligently manured.

Holland not only abounds in Canals for publick Use, but also in a Multitude of private ones; there being scarce any Commodity that is not brought to their

their Doors by Water. It is true, *Ireland* has not the Advantage of artificial Canals; but there is no Spot of Earth in the World better furnished with Rivers, either naturally navigable, or capable of being made so on easy Terms, than *Ireland* is: Therefore, to say nothing of the many others Rivers in *Ireland*, what vast Quantities of Hemp might the *Shannon*, the *Barrow*, the *Noar*, the *Sure*, and the *Black-water* furnish to Factories for Sail-cloth or Cordage? The Factories for Sail-cloth at *Waterford*, *Rakail*, and *Dunkittle*, are not only well placed for Water-carriage, which is a great Article in such cumbersome Goods as Hemp is; but also are situated in the Neighbourhood of good Soil. Indeed *Dunkittle* is the remotest, yet might it be very well supplied with Hemp; if the People that live on the *Black-water* were industrious to raise it, and bring it by Water to *Youghal*, thence it may be boated to *Dunkittle* with Ease.

S E C T. III.

Of Plowing for Hemp in Holland.

THEY plow in *Holland*, especially in *Targou* or *Gauda*, in a Manner vastly different from ours; occasioned (as I conceive) by the Werness and Depth of their Soil. They plow their Leys in *August*, and so let them lye till *April*, that their Grounds may be hard enough to bear their Horses; which does not always happen, for sometime their Land is so poachy, that Horses cannot stand thereon; then are they forced to dig it: But in case their Horses can stand, they harrow it across with heavy Iron Harrows in *April*, which break the Sods with great Ease; they having lain from *August* to *April*, that they become rotten.

When they plow their Leys they seldom go deeper than four Inches, which cut the Turff or Sods so thin, that it soon rots; besides the Soil is so rich, and the Frost so constant in the Winter, that their Land is soon mellow'd, and yields to their Harrows without Obstruction: These Harrows cleanse their Grounds from all Rubbish and Filth: Then do they fall to Plowing their Ley grounds, with as deep a Furrow as the Nature of their Lands will admit of.

The Ridges made for Hemp in *Targou*, are generally from twelve to sixteen Foot wide: Their Furrows are very narrow and shallow, because

Plowing.
Wetness
and Depth
of their Soil.

Land
poachy.
Digging
the Land.
Harrowing.

Plowing
their Leys.
Richness
of the Soil.
Land
made
mellow.
Plowing
their Leys.

Ridges.

Of cultivating and

they have very large Drains, at every ten or twelve Perches further Distance or nearer, as their Grounds are more or less wet.

In *Uvetch*, the Lands are a stiffer Clay than in *Targon*. *Targon*; they make their Ridges thirty or forty Foot wide, their Furrows deeper; they raise there a very good Hemp, and great Qualities of it, they have likewise large Drains, but not so close together; the Grounds about *Uvetch*, not being so marshy and wet as in *Targon*.

S E C T. IV.

The Author's Opinion, what Culture might be most proper for Lands in Ireland.

IF the Soil be deep and rich, with a good Bottom, distant from hard Gravels, Quarries or blue Clay, (any of which would hold the Water) such Lands need no more Plowing & Harrowing, than just to bring them to be mellow and clean, the Mold made as fine as possible, and the Ridges laid as flat at the Top, as they are in *Holland*. I approve of Mr. *Slator's* making his Ridges narrow, for the Conveniency of pulling the Fimble-hemp, because the Labourers in *Ireland*, are not so expert as yet, at the pulling of Hemp, as the Boors in *Holland* are: And I likewise approve of his Directions, as to the making of the Furrows and Drains for carrying off the Water.

There are many Places where the Soil is good and proper for Hemp, were it not too thin; Quarries of Stone, or a hard Gravel, or stiff Clay, lying too near the Surface of the Earth; a careful Husbandman might gather this Soil by his Plow, and double, or more, the Depth of it. These Grounds well harrowed, and laid flat at Top, will bring as good a Crop of Hemp as the other.

Loamy and Clay Grounds require to be thrice plowed, well broke with Iron Harrows; the Crop will scarce be as good as the former; the Furrows should be deep, and the Ridges pretty high, then the Husbandman may expect a Crop, which may sufficiently reward his Labour.

S E C T. V.

Of Pulling and Watering of HEMP.

THE Fimble-hemp is the first ripe: The Way to know when it is so, is by observing when the Leaves turn yellow towards the Roots; and also, if, by touching the Stalk of the Fimble-hemp with a Strick in the Morning, you perceive a Dust, and that the Blossom falls easily off, then is it fit for pulling: But these Signs will not appear in all the Fimble-hemp at one and the same Time; for the short Fimble is sooner ripe than the long Fimble; yet Care must be taken not to leave the long Fimble-hemp unpulled, after you perceive the other ripe; for if you should let it grow too long a Time, after the above Observations appear, the short Fimble will be over ripe, and be of no Use.

In *Holland*, they pull the long Fimble-hemp separately and apart from the short; especially, such as they perceive to have shed its Leaves and Blossoms, because the short Fimble is longer Time a raring than the long Fimble is: They are so careful not to break or bruise the Carl-hemp, as they pull the other, that when they pull their Fimble, they are forced to take off their Coats and Shoes, and tuck the Skirts of their Vests within their Breeches, and also have the Sleeves of their Vests made so tight to their Arms, as none of their Cloaths might break or bruise the Carl-hemp: And tho' their Ridges be so very wide, that they are forced to walk through the Hemp, yet will they not break any Part of it.

When they have pull'd a large Handful of either sort of the Fimble-hemp, then do they bind them with two Bands, one at a small Distance from the Top, and the other towards the Butts, and let it lie three or four Days in the Air, to stiffen; after which they take thirty or forty of these small Sheaves, and place them on the Butts, with the Heads leaning on each other; so by drawing the Butts of the Sheaves out, they leave the Pile as round and hollow within, as possibly they can; by which Means the Air passes readily through the Hemp, as it stands; thus they leave it till it is thoroughly dry, and the Stalks turned yellow; they then fall to binding of their Hemp in larger Sheaves, about three Foot in Circumference, and on each Sheaf they bind three Bands, *viz.* one in the Middle, and one towards each End; by which

*Fimble-
Hemp.
To know
when it is
ripe.*

*Short
Fimble.*

*Pulling
the long
Fimble-
hemp.*

*Ridges
wide.*

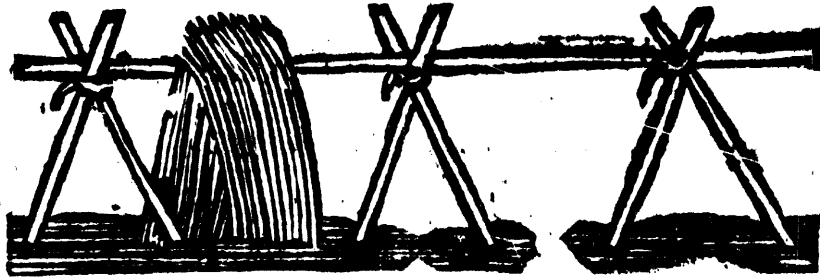
*Binding the
Fimble-
hemp.*

which Means, each Sheaf is made exceeding tight, and so proceed to rate it.

The *Dutch* always rate both their Flax and Hemp in their Drains, which are always large enough to receive their Hemp, in any Manner they are pleased to lay it. The first Range is laid long-ways, which they stich together with coarse Line, Sheaf by Sheaf, the whole Breadth of their Drain, to the end that the Sheaves may not separate from each other in the Water, and serve as a Foundation for such other Hemp as they design to lay over it. Their Manner of stitching their Sheaves together is thus: They first consider how many Foot wide their Drain is: In the next Place, they consider how many Sheaves, laid Side by Side each other, will fill that Space; so many Sheaves do they accordingly lay, and stich them to each other at both Ends, and in the Middle, with Lines which they have for that Purpose; then they shove into the Water that Parcel, and on the Surface of the Water they place it in the Manner they design it shall lie, when sunk; Then they proceed to make another in like Form, and shove that also into the Water, and range it so as it lies, at the End of the other. They afterwards make as many of these, and place them according to the Length they design to make their Pile of Hemp: That done, they begin and lay other Sheaves across one End of the former, and continue so to lay Sheaf by Sheaf, till they have quite covered the Sheaves first laid in the Water: Then do they pile up their Hemp of one Sort, till they come within twelve Inches of the Surface of the Water, when the Pile is sunk. The *Dutch* are forced to sink both Hemp and Flax when they rate them, by covering them with Muddsods, and such ponderous Things as they can get; Stones not being to be procured in those Countries. When this Pile is sunk of the short Fimble-hemp, they then apply themselves to the making of another Pile for their long Fimble-hemp: This is made exactly in the same Manner with the former.

When the Hemp has been in Water about four Days, they thrust their Arms down as far as they can reach, and at first draw out a Handful out of the short Fimble-hemp, which they rinse in the Water, and set it on the Butt, leaning on the Horse or Frame herein after described; and when it is dry, they try whether the Harl will easily quit the Bunn; if it does not, they repeat these Trials twice a Day, until they find that it will do; and then do they heave it Sheaf by Sheaf from off the Pile, rinsing each Sheaf from the Slime and Filth which clings to the outside of the Sheaf; that done, they immediately take off the Bands which were tied about the large Sheaves, and likewise those Bands at the Butt end, tied in the Field at the Pulling; and then set up these small Bundles against the Frame or Horse, in the Manner
you

you see herein below described, and there let it stand till it is perfectly dry, at which Time they bind it at each End, into Sheaves of what Size they please, and house it carefully. The long Fimble-hemp must be treated exactly as the former, & kept apart.



In *Ireland*, we cannot have the Opportunities of these Drains, which are so frequent in *Holland*; therefore, where we cannot have Loughs or Lakes, or other still Waters, we must have Recourse to Ponds made for that Purpose. I do not dislike Mr. *Slator's* Manner of making his Ponds, from any Experience I have of Inconveniencies which might attend them: Yet I should think, if they were made wide enough to receive at least one Sheaf athwart the Pond, if not more, for the better piling of it under the Water, I should think it were so much the better; for in my Opinion, the *Dutch* have some Reason why they lay their Sheaves across each other in the Ranges, alternately, and not lay it always one Way, as they must of Course do, if the Ponds are to be but four Foot and a half wide. It is certain, the Sheaves lie closer when they are all laid in the same Manner, than when they are placed as the *Dutch* place them; and consequently, the Water has a freer Access, which may be of more Importance to the proper rating of Hemp, than at first Sight appears. As to the Depth of the Ponds I think Mr. *Slator's* is sufficient, considering the great Expence which must attend the making them the same Depth the *Dutch* have their Drains; besides the Hazard of meeting with Rocks, which they in *Holland* are in no Danger of.

Ponds should be made in stiff Clay, rather than in gravelly Grounds, there being less Danger of meeting with Rocks in Clay-grounds than in Gravel: For should a Husbandman happen to light on a Rock or Rocks in sinking his Pond, he must either lose what Labour he has been at, or be at the Expence and Trouble of bringing the Bottom to a Level, and also to a Face fit to receive Flax or Hemp: For if the Points or sharp Edges of Rocks lie near to the Harl of Flax or Hemp, whether on the Sides or in the Bottom, they will cut the Harl as far as they reach; besides, Clay-water is generally preserved more soft than in gravelly Grounds: For these Reasons, I prefer Clay to Gravel.

Loughs.

Ponds.

Depth of the Ponds.

Ponds should be made in stiff Clay.

Edges of Rocks.

But

But Mr. *Slator* is much in the Right, in preferring
Gravelly Gravelly Grounds to Grounds composed of loose
Grounds. Earth, or boggy Soils, for making the Ponds in ;
 for to be sure, these loose Grounds will be always
 falling in, and not only foul the Water, but be apt to let the
 Water go: I scarce think, that Ponds made in such Sorts of
 Soils as these, will ever turn to account ; for flag them or plank
 them, it would be all one ; the Water will wash under and be-
 hind them, and it must be an immense Charge to keep them in
 Repair.

How long The *Dutch* always house their Hemp after it is
Hemp. rated, because their Quantity is not so great, but
 that they can afford it House-room : And they have
 been in the Enjoyment of this Husbandry for so many
 successive Ages, and their Profits so great thereby, that it is not a
 Matter of Wonder that they are supplied with every thing requi-
 site thereto : Whereas our People of *Ireland* are Novices therein,
 and as it were, making Essays to see, first, whether the Thing is
 practicable : Secondly, whether it is worth their Time. It is to
 be hoped, that some are convinced of both, yet it is evident,
 that many are not ; and until this Sort of Husbandry be more
 generally known in those Parts of the Kingdom proper for raising
 Hemp, and also practised, the Profits will be in particular Hands,
 who will not launch out their Money in the making of Barns,
 and other Improvements proper for this Culture, in which they
 have had hitherto so little Experience.

However, Mr. *Slator* has very justly stated the Conveniences and
 Inconveniences attending the present Practice in *Ireland*, by the
 Want of convenient Barns. I shall conclude this *Section* with this
 general Apology in my own behalf, for being so large in my Ob-
 servations and Remarks though this System of flaxen and hem-
 pen Agriculture, That I conceive it to be so much my Duty,
 fully to inform all Persons engaged or to be engaged in this im-
 portant Matter, that I submit rather to be censured as prolix than
 deficient.

S E C T. VI.

Of Breaking of Hemp.

Breaking THE *Dutch* use a Method in breaking of their
of Hemp. Hemp, rarely practised in *England*, that I
A large know of, which is thus : They make a very large
Kiln. Kiln, sometimes built with Brick, but more frequent-
 ly with Sods ; which Kiln is made about five Foot
 high, ten Foot long, and eight Foot wide, flat at
 the

the Top; over which, cross Pieces of Sticks are laid, which are wattled thin: On this they lay their Hemp in the small Bundles they were at first tied in the Field, then with the Hurds or broken Straw of the Hemp, or some such combustible Matter, they dry it well, and afterwards take it thence, and cover it close about three Hours, there to sweat: Then they proceed to break it, in Breaks made much like ours, save only they are not so deep mashed. In the breaking, they begin at the Top of the Hemp, and work it downwards till the Shoves are sufficiently wrought out; and they never swingle Hemp in *Holland*. When they have wrought to the Butts or Roots, they turn the Butt-end the other Way to break it; and if all the Butts do not readily break, they have a blunt Knife lying by them, wherewith they scrape such of the Roots and Butts, as the Breaks did not effectually divide the Harl from the Bunn, until the Harl and Bunn are well separated: This Scraping they perform across their Knees, as frequently as requisite.

The pulling of the long Fimble-hemp apart from the short, is not only necessary with regard to the Watering, but a sort of absolute Necessity in the working of them; for should the long Fimble-hemp be broke, and hackled promiscuously with the short, it would occasion vast Waste; for the Artift always holds the Roots in his Hands, as evenly as he can. When he breaks or hackles, he must work the whole Hemp equally down to the Roots; and if they be of a very unequal Length, the Tops of the long Fimble will be over wrought, and rendered useless, if any of them should happen to remain.

Mr. *Stator* has given the proper Reasons gainst grassing of Hemp, therefore I shall take no Notice of it at here.

They have in *Holland* about a Guilder per Hundred for breaking of Hemp, which is two Shillings *Engl* sh.

S E C T. VII.

Of Pulling and Sawing the Carl-Hemp.

THE People in *Holland* who are best skill'd in raising of Hemp, determine their Carl-hemp to be ripe and fit for pulling, by the following Methods. First, they observe whether any of the Seed begins to appear, and has burst the little Cell, or Seed-bed that Nature has provided for it. Secondly, whether those Seeds so appearing, have the Kernel of them perfectly formed, or whether it be soft and like a Jelly; if so be that it is soft, they allow it to stand longer to ripen; but if the greater Part of the Seeds be hard and well filled, they do not defer pulling of it longer: And their Method of pulling the Carl, is the same with

that of the Fimble in every Respect ; especially pulling the long Carl apart from the short, and binding them in small different Bundles, &c. as much as a Man can well hold in his Hands.

These small Bundles of Hemp being bound at each End, as the Fimble-hemp was, they raise up upon the Butts, on each side of the Frame or Horse formerly described : They make these Frames or Horses with any Rubbish of Wood they can get ; they are far from being costly, tho' they have many of them ; because they in the drying of their Hemp, are so very careful, as not to dry their long Carl hemp at the same Frame with their short, lest the long might shade the short, or else over top them, and prevent their drying : Sometimes they venture to put three or four Sheaves, one over the other, as they stand leaning on the Frame ; but if they do so, they are sure to remove them, and turn them after such a Manner, as that all the small Sheaves may be equally weathered ; thus do they let it stand till the Leaves are perfectly dry, and the Seed ready to shed.

They then provide Sheers or Winnow cloths, and spread them in some convenient Place in the Field, and thereon lay two Pieces of Timber, about eight Inches square, and ten Foot long ; these Pieces of Timber are placed just opposite each other, at five Foot Distance ; over which they lay the Tops of the Hemp hanging : About a Foot beyond the Timber two Men stand, within the Winnow-cloth or Sheet, and with Flails thrash out the Seed, as the Sheaves hang over ; and at the Butt-end of each Sheaf stands a Woman, who constantly turns the Sheaves, still, as the Seed is beat out. When the Sheers begin to fill with Seed, Women come and take it thence to riddle it ; which they do through a wide meshed Riddle, & sever the Seed from the Leaves, Stalks, and grosser Part of the Filth, which was before mixed with it. Yet, as to the Dust and Chaff which passed through the Riddle along with the Seed, they leave that to remain with the Seed, until such time as the Seed is compleatly dry ; because it is their Opinion, that this Dust and Chaff prevents the heating of the Seed as it lies drying.

When the Seed is thus thrash'd out of their Hemp, they convey it to a well boarded Floor, where it is laid much in the same Manner, as Malsters lay their Couch of Malt, about two or three Inches thick ; and they turn it once a Day regularly, during the first three Weeks, not suffering the Man who turns it, to have either Shoes or Pumps on, lest he should break or bruise the Seed by treading on it. About three Weeks afterwards, they clean their Seed again, but not entirely from the Chaff or Dust : For the former Reason, they continue the Seed still on the boarded Floor, and observe to turn it twice a Week, till the Season comes for sowing it.

Hemp Seed is generally sold in *Holland* at eight *Guilders* per Hog-head, which is sixteen *Shillings English* Money : Their Hog-heads

sheaves ought to hold seven Bushels of their Measure ; each of their Bushels being an eighth Part less than our *Winchester* Bushel. The *Dutch* are a very frugal People, yet I think Mr. *Slator's* Method of thrashing out his Seed, is much more saving than theirs ; for when Hemp is dry, it is very apt to shed its Seed, great Part of which must be lost, by removing it Sheaf by Sheaf to the Place where it is thrash'd ; and there are in *Holland* many more Hands less usefully employ'd, by thrashing out the Seed in their Manner than in his : Therefore as it was my Duty, not only to observe their Practice, but likewise to display to the Publick (in Obedience to the Commands of my Employers) the best Practice, according to the best of my Judgment, without copying the *Dutch* beyond Reason.

S E C T. VIII.

Of Dressing or Peeling of Carl-hemp.

TH E *Dutch* never break their Carl-hemp with Breaks, lest the Bunn should cut the Harl ; they therefore peel it in the following Manner ; that is to say, they break with their Fingers, the Bunn or Straw of the Hemp, about six Inches from the Top or smaller End of it ; then they bruise the Stalk or Straw of it between their Thumb and Fingers, down to the Butt or Roots ; which causes the Harl or Skin to split, so as the Bunn is easily taken out : They afterwards clear the Tops that they have broken off from the Bunn ; then hang the Harl on a Chair Back, or a Pin set up for that Purpose, till they have gathered about a Pound or two of Harl ; and keeping the Butt-ends of their Hemp all together, as even as they can, they lap the last mentioned Harls up in Bundles, and lay it by. Yet all this While they never mingle their long Carl with their short, but constantly work them apart.

Their Time for peeling the Carl-hemp is, either during the long Winter Nights, or such wet Days, as they cannot work abroad in the Fields. This is the merriest Time in the Year for the Boors ; for then it is, that the Neighbours make their Visits to each other, and assist to peel the Hemp. The Man of the House then treats his Neighbours in a very commendable, friendly, yet frugal Manner ; he lays Pipes and Tobacco before them ; the Frow brings in a Slice of Rye-bread, exceedingly thin spread with Butter, and a thin Slice of Wheat-bread, nothing better furnished with Butter than the former ; between these two Pieces of Bread and Butter, is placed a Piece of Cheese, so exceedingly thin, that ten of them would scarce make an Inch ; these are delivered to every one of the Guests, which they eat with great Comfort, and wash down with a Draught of their brown Beer, much like to our six Shilling

Shilling Beer, in point of Strength; then, in order to warm their Stomachs, they have a Viol of Geneva, which they call a *Bubblekee*, and holds about half a Pint; this Viol is contrived to be so narrow at the Throat, as that the Geneva can't come out more than Drop by Drop; and a Man must be exceedingly well breath'd, that can suck thence more than half a Spoonful at one Pull; for it is not customary to take a second Pull at it, and the *Dutch* are strict Observers of their own Customs and Manner of living, so that after one Man has had his Pull at the *Bubblekee*, he must in good Manners deliver it over to his Neighbour, and so it goes round

I have made this Digression, without Design of reflecting in the least on the *Dutch* for their Frugality; but on the contrary, to shew my Countrymen how the *Dutch* have acquired, and do still acquire, that vast Wealth of which they are Masters. I have in part given them a Specimen of their Industry, and now an Instance of their Frugality and Abstinence; and with Concern I speak it, were these merry Meetings made at *English* or *Irish* Houses, the Mutton, the Poultry, and the Bacon, as well as the Beer, Ale and Brandy must have paid the Shot: Besides, the Mistress and her Family must have been diverted, each of them from their Household Affairs, to attend the Affairs of the Kitchen and Pantry.

In *Muscovy* and other Parts of the East-land Countries, where they raise vast Quantities of Hemp, they have Wind-mills, or Water-mills so contrived, with Rollers one after another, as they can break the Hemp with Safety, and with such Dispatch, as to afford the doing it at sixteen Pence *per* Hundred. In those Countries where these Mills are, they have the Conveniency of Water-carriage, by the Means of their Canals and navigable Rivers. It is true, we have no Canals, but we come no ways behind them with respect to navigable Rivers. If the Publick is disposed to have such a Mill made, I dare venture to direct the making of it exactly.

Foreign Countries are very careful to promote their Manufactures, by the Help of Engines that dispatch more Business, and frequently better than many Hands can perform; by which Means they always under-sell us in foreign Markets. We may easily in *Ireland* arrive at such a Degree of Perfection, as to furnish *Great Britain*, our selves, and the foreign Plantations with Sail-canvas and Cordage; which ought to be vend'd as cheap as our Neighbours can afford them: But if ever we expect to have Share of Trade in foreign Markets, it must be by exceeding them in point of Goodness, and by selling at Rates as reasonable; these can never be compass'd, but by acquiring the best Engines proper for Trade, that are us'd any where with Success; or by contriving at home, others equally good.

S E C T. IX.

*To what Uses the Dutch convert their Fimble-hemp,
and Carl-hemp.*

TH E Fimble-hemp is in *Holland*, for the most part, employ-
ed to the making of Sail-cloth, they seldom making hem-
pen Linnen; it is sold there generally, from two and twenty to
thirty Shillings per Hundred.

The larger Carl they generally work into white Cordage; some-
times they mix their own with the *Riga* and East-land Hemp,
wherewith they make Cables; but generally speaking, they make
their large Cables of *Riga* Hemp, the *Dutch* themselves being of
Opinion, that their own Hemp would contract, or draw up in the
Salt-water, should any of the large Carl-hemp be employ'd to
the making of Cables. This long Carl sells in *Holland*, from four-
teen to twenty Shillings per Hundred.

The short Carl, they cause it to be beaten well in their Hemp-
mills, and afterwards hackled, for making of Twine for Fishing-
nets, or for the Sail-makers Thread, wherewith they sew the
Sails. Pack-threads and Shop-threads are made with the Tow
or Hurds of the short Carl, which last mentioned Hemp sells ge-
nerally in *Holland*, from two and twenty to five and twenty Shil-
lings per Hundred.

The *Dutch* never make Sail-cloth of either of their Carl-hemp;
and we in *Ireland* have endeavoured to make a Tryal, how far we
could work up their Carl-hemp in Sail-cloth, but we could not
make it do, any more than they. Tho' we make tolerable Sail-
cloth with the Carl-hemp which grows in this Kingdom, yet I
am very sure, that the Factories for Sail-cloth in *Ireland*, would
find more their Account in making all their Sail-cloth of Fimble-
hemp; because it is much more easie to bring this to Colour,
than they can possibly bring the other.

S E C T. X.

Of Hemp-Mills.

IT is scarce possible to keep a Sail cloth Factory, without Hemp-
mills to beat their Hemp: There are four of these Mills e-
rected in *Ireland*, at the Expence of the Publick, exactly in Imita-
tion of the *Dutch*: but these are found too costly for private Un-
dertakings. In *Denmark*, they have found out a Way of making
their ordinary Corn-mills, with a very small Expence, in compa-
rison of the other, to answer all the Ends and Purposes of Hemp-
mills:

mills : It is thus, They make the Beam of the Mill-wheel so much longer than usual, and place the Cogs they design to employ in the Hemp-mill, in proportion to the Number of Beaters they have Occasion for. Any Mill-wright that has once seen a Hemp-mill, and consider'd it, may soon make a Corn-mill to perform this Office. The *Dutch* beat their Hemp in their Mills after this Manner, they take about two Pound of their Hemp, which they turn over at the Middle, they then fold down the two Ends, and tuck them into the first Fold, as close to the Head as is requisite to make the Truss of Hemp, very near the Length of the Trough, and the Breadth of the Beater or Stamper : These Beaters or Stampers are raised by the Cogs fix'd in the Mill-wheel Beam, and the Beaters being made of large weighty Timber, come down with great Force and Violence, and are so contrived, to turn the Hemp in the Troughs, each Stroke they give it : When the Hemp begins to be warm with beating, they take that Bundle or Truss out, and put in another, and while that is beating, they open the former Truss, give it a Shake, and adjust the Butts as evenly as they can, and so truss it again, and lay it on the Bench by them, made for that Purpose ; by this time, the second Truss is sufficiently hot, which they therefore take out, and supply with a third : They manage the second as they did the first, and lay it on the same Bench, in Course and Order as it was beaten ; so they proceed, till they have beaten as many Trusses, as the Miller judges will hold beating alternately, so as the first Truss may be cold enough to be beaten a second Time : Then they proceed to beat and manage the Trusses, one after another, in the Order and Course they were laid, and in the same Manner exactly with the first. These Beatings must be repeated, until the Hemp is soft enough to be spun.

In *Holland*, the Hemp-millers is a Trade of it self, and requires much Judgment and Experience, to know to what Degree of Heat the Hemp may with Safety be beaten, without firing or discolouring it : You ought also to know when it is soft enough for the Spinners : And a good Miller of Hemp ought to be handy in the Repair of his Mill, whenever there is Occasion, else the whole Factory may be kept idle, and the Employer at great Expence for dead Wages. The Miller, together with the Owner or Occupier of the Mill, have in *Holland* eight Stivers *per Cent.* for each Hundred of Hemp they beat and truss, which is about ten Pence *Dish*, and is two Pence less than what is at present paid in *Ireland* : This may be thought an inconsiderable Difference in Trade, but they who consider Manufactures rightly, must endeavour to save the minutest Part of all Fractions, on every Bolt or Piece of Canvas they make, else these Fractions in a bulky Trade, may be a great Loss to the Nation. I have never observed the *Dutch* to lose in the beating or hackling of their Fimble-hemp, more than ten Pounds in five Score ; sometimes, nay very often,

often, their Loss is less : I fear it is much greater in *Ireland* : I am sure it was so when I was concerned at *Dunkittle* near *Cork*, before I went to *Holland*. Since my Return, I have not had either Leisure or Opportunity to be informed how that Matter is ; for if the Loss be greater here than in *Holland*, it may proceed from many Reasons, as well from the Nature and ill Management of the Hemp, as from the Faults in beating and hackling.

S E C T. XI.

Hackling Hemp for Sail-cloth.

THE Hackles which the *Dutch* make Use of for hempen Sail-cloth, are much finer than those employed to the same Purpose in *Ireland* ; on their coarsest Hackle, they make their first Hackling, and dress the Butts, and other the coarsest Part of the Hemp, to be of equal Fineness with the rest, they finish on a Hackle as fine as those which came from *Coventry*, called Number four ; by which Means they dress their Hemp of equal Fineness to the Flax, wherewith Yarn of two Dozen in the Pound Statute Reel, and Count, is usually made in *Ireland* : They hackle their Tow or Hurds as free from Knots as may be, and place them in the Inside of the Tare : This Tow or Hurds will never spin well, if it be knoted ; and it is of them that the Woof-yarn is always spun.

Hemp for Sail-canvas must be hackled very fine, else the warping Yarn, which is always made of Tare, will not be sufficiently plyant, and yield to the Slay in the beating up of the Woof, be the Slay-board never so weighty. The Warp-yarn for Canvas must be both strong and plyant, to prevent the Yarn's breaking, which composes the Warp, which otherwise would be attended with many Inconveniencies : As, in the first Place, many Knots spoil the Skin of the Canvas ; to conceal which, the Weavers, as they weave, cut these Knots as close to the Skin of the Cloth, as they can : By which Means, as soon as the Canvas is strain'd by the Wind, it runs into Holes immediately. In the next Place, it occasions great Delay to the Weaver : But that which is the worst of all, is, that in case the Warp be not plyant, the Woof can never be close enough beded, admitting it to be three Stroke Work, which is what is generally given to Sail-canvas ; and if the Woof be not close beded, the Canvas will draw a Wind, and prevent the Ship from lying by the Wind, when there is Occasion.

The Hackling the Tare fine, must of Necessity make more Tow and Hurds, than otherwise ; but that is no Loss to any Body, because the Tow or Hurds are always spun into Woof yarn, which is equally valuable with the former, when wove into Canvas.

The

The Tow or Hurds which are taken off the Butt-ends, and coarsest Part of the Hemp, in the Dressing, the *Dutch* never suffer to be wrought into Canvas, but apply these last sort of Hurds to the making of Bed-cords, or Cords made use of in Packing.

Each Hundred of good Hemp produces in *Holland*, from 42 to 48 Pounds of good Tare. The Hackler has five Stivers (which is Six-pence *English* Money) for every twelve Pounds of clean hackled Hemp, which is near one half cheaper, than it is done in *Ireland*; and consequently a heavy Clogg on our Trade. I cannot see any Remedy thereto, but by increasing the Number of Hacklers and Swinglers, from all Parts of the World where they can be had, and by instructing the Natives of the Country, to be sufficiently skill'd therein; for each of these Artists are exceedingly requisite to this Kingdom, both of them necessary to the breaking, swingling, and hackling of Flax, and also requisite to the breaking and hackling of Hemp, allowing the People here should conform to the *Dutch*, and never swingle Hemp.

S E C T. XII.

Of Spinning Hemp for Sail-canvas.

THE Wheels which they make Use of in *Holland*, where with they spin the Warp-yarn for Sail-canvas, are much the same with those commonly used in the *Irish* Factories; yet the *Dutch* are more careful in the proportioning of their Whirl, Spool, and Flyers, to their Wheel, and also in making the Whirl, the Spool, and the Flyers, conform to each other; without which it is difficult for the Spinners to make the Thread equal, and the Twist to be neither more nor less than it ought; for thereon depends the making good Sail-cloth: For if it be over-twisted, it will never be plyant, which is so great a Requisite, that without it, it is impossible to make a good Cloth, for the Reasons already given. And on the other Hand, if it be under-twisted, the Warp will be weak, and the Woof start into Holes immediately. I could never yet see a Wheel-wright that could determine what the exact Proportions of these Things ought to be, with regard to each other, so as they might be reduced to some Certainty, by Geometrical Rules in Mechanism. It is certain, that each Wheel-wright has some Rule by which he makes his Wheels and Tackle; but either he cannot or he will not make that Matter intelligible to others, so as a good Mechanick-head might bring this Machine under some certain Regulations: For my Part, it is a Province I dare not undertake; for should I be guilty of the least Mistake, the Errors might be attended with very ill Consequences.

In the fixing the Tare to the Spinner's Waste, the *Dutch* always have an Apron on, they Place the Harl equally before them at the Waste, lapping the two Ends between their Body and the Apron-strings, and draw the Thread from their Waste into a small Hole that is made for that Purpose, at the End of the Spool. They always spin their Warp in this Manner, because it twists less, and they find they can dispatch more Work that Way. A good Spinner in *Holland*, can, with Ease, spin from nine to twelve Pounds of Tare in a Day.

The Woof is all spun on Wheels like to those which we call here in *Ireland*, long Wheels: This they likewise spin from the Waste, and is performed in the same Manner as the white Cord-makers spin their Yarn, of which they make their Ropes; the Spinner going back to a proper Distance, while another turns the Wheel: And when he has gone as far back in spinning as is proper, he there stops a very little Time, and then advances, till the Thread he has spun, be wound up: By this Means, the Woof has a softer Twist than the Warp. A good Hemp-spinner will spin from fifteen to eighteen Pounds a Day, of Woof-Yarn. The Price for spinning of Warp, is there eighteen Stivers per Dozen, which is between one and twenty and two and twenty Pence *Engl.* The Price for spinning of Woof-yarn is fifteen Stivers per Dozen. A good Spinner will spin a Dozen & a Half of a Woof-yarn in a Day. I know not what Wages is now given at the Factories, for spinning of Warp and Woof for Sail-cloth; but if a Man may be allowed to form a Judgment of spinning of Hemp, by the proportionable Hire given generally to Spinners, for spinning of Flax, it will be found, that Hemp-spinning might be afforded in *Ireland*, vastly cheaper than in *Holland*: For if two Pence a Hank be in *Ireland*, thought good Wages for spinning of flaxen Yarn, of two Dozen in the Pound, Statute Reel and Count; and, generally speaking, the Flax spinners do not spin more than a Hank and a half, one Day with another, of Yarn of that Set, whereby the Spinner earns three Pence a Day: How comes it to pass, that the Hemp-spinner should be allowed to earn one and twenty Pence a Day, on Warp, and seven and twenty Pence a Day, by spinning of Woof? The Difficulty is soon solved. There are in *Ireland*, two thousand Flax-spinners, for one Hemp-spinner; and if I have Flax to spin, the Spinners being many, court my Work: If I have Hemp to spin, the Spinners a few, & I must court them. Therefore, to diffuse this Art of spinning of Hemp, and make it more general, it were adviseable, that all the poorer sort of People throughout the whole Province of *Munster*, and such Parts of *Connaught* and *Leinster*, as have the Conveniency of the *Shannon*, the *Burrow*, and the *Near*, be taught to spin Hemp, both Warp and Woof; that the Owners of the Factories be obliged to have Agents in proper Places, for the more convenient and easy carrying on of this Trade: By this Method, the Factories will be

supplied with Spinners, at easy and cheap Rates; and, by the Means of Water-carriage, divers other Advantages will accrue to the Publick, which might be now demonstrated, were I not afraid of trespassing too much on the Printer's Time.

S E C T. XIII.

Of Bleaching Sail-canvas Yarn.

THE Dutch bleach their Canvas-yarn with a Boiler, which they call a Tirnine. This Engine is made of Brass, narrow at the Bottom, and widens gradually as it rises to the Top: It has a close Cover made of the same Metal, in which there are Vent-holes of about three Inches Diameter; over which Holes they place small sliding Covers, by Means whereof they can give Vent to their Lees, when boiling; for otherwise, all would fly as the Heat increased: For sometimes the Lees boil with that Violence, that they will shoot through those Vent-holes, six or eight Inches high above the Cover: For which Reason, the Boiler it self, and the Lid which covers it, are so contrived, as to be somewhat hollow at the Top, to receive the Lees again as they fall down on the Lid, whence they easily pass down again into the Boiler. They are so apprehensive of the Violence that these Lees may possibly arise with, they have a strong Bar of Iron placed cross the Funnil, to which another Iron-bar is fixed, that comes down to the Lid of the Boiler, in order to keep the Lid fixed in its Place, till they see Occasion to remove it. These Tirnines can boil about a hundred and twenty Pound Weight of Yarn at a Time; they are fixed in Brick and Lime, exactly in the same Manner with our Furnaces, with proper Grates for the Fire; and as near to the Bottom of this Tirnine as they conveniently can, they place a Cock, to let go the Lees, when the Yarn is sufficiently boiled.

Their Manner of boiling their Yarn is thus: They take about ten Pound Weight of the Hanks of Yarn, and lap each Hank over the other, round like a Ball; they have ten of these Balls lying by them: They then fill their Tirnine three Quarters full of cold Water, then make their Fire under the Tirnine or Boiler, till the Water is Milk-warm. In this Water, they place first one Range of the Yarn, lapt up as aforesaid; they are exceeding careful in the laying their Yarn in the Boiler, lest it may tangle; and over the Yarn that is first laid in the Boiler, they strew about five Pounds of Ashes, mixed and prepared in the Manner herein after mentioned; then they put in another Layer of Yarn, and strew the like Quantity of Ashes over it: Thus they proceed in the laying in of their Yarn, constantly strewing over

each Range five Pounds of Ashes, till all the Yarn, with its Proportion of Ashes, is laid in the Tirnine: They are forced to press the Yarn hard down, that they may put on the Cover. Thus, at every Boiling, they use about sixty Pound Weight of Ashes; they make a sharp Fire, under the Tirnine, so as to cause the Lees and Yarn to boil for three Hours, as sharply as they can, opening the Vent-holes gradually as the Heat encreases; or rather as they see there is Occasion for giving it Vent, they will close and open these Vent-holes neither more nor less, than absolute Necessity requires; so desirous are they to preserve the Spirit of their Lees from flying away as they boil, that it may remain and do its Office on the Yarn.

When the Yarn has thus boiled during three Hours, they open the Cock which is placed near the Bottom of the Tirnine, and let go the Lees: After the Lees are gone, they pour cold Water into the Tirnine over the Yarn: The Quantity of cold Water is much the same with that which the Yarn was boil'd in, having first removed the Fire from under the Tirnine; they then let go this Water at the Cock, and load in fresh cold Water, and as it empties at the Cock, they continue lading in of more Water, till the Yarn is pretty cold, and has done smoaking; then is the Yarn carefully taken out of the Tirnine, and opened Hank by Hank, constantly throwing cold Water thereon, till all the Hanks which were in the Tirnine, are perfectly cold.

The Yarn being sufficiently cold, they first rinse it very well, in fair, cold Water, and afterwards lay as many Hanks on the Battling plank, as they can conveniently spread thereon, and their Battling-sticks can reach. They never lay their Yarn thicker than two Hanks, while they batt; and their Manner of making of their Batts is, by tying two Sticks together like Flails, but that which comes down on the Yarn, is always made as smooth and even, as they possibly can get them, lest the Knots in the Sticks might break the Yarn. While the Yarn is a battling, another Person with a Scoop casts cold Water continually on it: When one Side is sufficiently batted, they turn up the other, till they have batted that Side likewise in the same Manner: They then rinse it well, and wring it on the Engine hereafter mentioned, till it is freed from the Water. Their next Care is to put these Hanks one by one, on smooth Poles which they have for that Purpose, and shake the Yarn very well, and spread it on the Poles, so as none of it may cling together; that done, they lay carefully Poles and all on the Grass in their Bleach-yard, during three Days and three Nights, turning it every Day in order to bleach it; yet they never suffer it to lye longer Time on the Grass, but afterwards raise it with the Poles, on the Horse prepared for that Purpose, where it hangs till it is dry.

That which I here call the Horse, are square Pieces of Timber, of about six Inches square, ten Foot high above the Surface of

the Bleach-yard; they are fixed in the Ground at the Edges of the Grass-plot, pretty deep, that they may stand the firmer, and at the Distance from each other, is proportion to the Length of the Holes, which generally are between five and six Foot long; in these Posts there are Catches fixed on that Side next the Green, and they always put as many of these Pegs or Catches one under another, as they conceive the Horse can bear, in proportion likewise to the Length and Depth of the Hanks and Poles as they hang; taking great Care, that the upper Ranges of the Yarn bear not on the lower, as they are moved by the Air or Wind: On these Horses the Poles are hung, with as much Yarn thinly spread, as can well stand between each Post, and there they let it hang till it is dry.

While the Bleacher was thus managing of the first hundred and twenty Pound of Yarn in his Bleach-yard, in order to bring it to Colour, the Boiler or Tirnine does not during that Time stand idle, but is filled with a second, and after that with a third, fourth, and fifth Proportion of Yarn, each of them equal to the Quantity first boiled; by which Means, they have in a few Days boiled, and prepared six Hundred Weight of Yarn fit for bucking.

Before I proceed to describe the Manner of the bucking of their Yarn, it is requisite that I acquaint my Reader with the many other Conveniences in and about the Bleach-yard, which the *Dutch* are very careful to provide, so as nothing may be wanting, that is either necessary, or convenient for to compass their Ends: For this Reason it is, they have always their Bleach-yards at a Distance from any High-ways, or other Places where the Dust may be raised by the Wind, which may drive over their Bleach-yards, and spoil their Work. And to the end nothing offensive might come into the Bleach-yard, they have a Wall about eight or nine Foot high, built at the Extrems of all the Bleach-yard; under the Shelter of these Walls they build Pent-houses, wide enough to set their Yarn with the Poles across them, when the Weather is so wet or windy, as that it is not convenient to have the Yarn hang abroad on the Horse; therefore, let the Wind blow from what Point of the Compass it will, they are provided against any Inconveniences of Wind or Weather: And lest the Turf of their Grass-plot should be either foul'd, or dirtied, or worn out by their Labourers treading on it, more than what is of absolute Necessity, there is always a Walk of six Foot wide, between the Pent-houses and the Green, where the Labourers perform all their Labour or Work; excepting only when they spread their Yarn on the Green, or when they mow, sweep, and roll it; for they keep their Green as fine as a Bowling green, lest their Yarn be stain'd, either by long Grass or Flowers; this they would infallibly be, if the Green was not kept with the utmost Exactness.

When they have boiled five times a hundred & twenty Pound Weight, and prepared every Part of the Yarn, so as to have six hundred

hundred Weight ready for bucking, (counting five Score to each Hundred) then they proceed to buck this six hundred Weight of Yarn altogether, after this Manner :

They have in their Buck-house, close to their Tirnine or Boiler, an Engine made in the Form of a Chest, of two inch'd Plank, about eight Foot long, five Foot wide, and six Foot deep ; this Chest is so contriv'd on the Outside of it, that the Planks may slide up and down and be taken out, for the more convenient filling the Chest with the Yarn and Ashes ; and the Joynts are so contriv'd, as to shoot into each other, & so retain the Lees while the Yarn is bucking : In the Bottom of this Chest they have Holes made by an Augre, somewhat larger than an Inch, each Hole a Foot Distance from each other ; they stop these Holes with Plugs, and when they see occasion to let go the Lees, they take out as many of the Plugs as is necessary. This Chest is placed a little in the Ground, over a hollow Drain made with Brick and Lime after such a Manner, that all the Lees that come from the Chest, pass thro' a Gutter, (made likewise of Brick & Lime) to an open mouth'd Vessel, placed there on purpose to receive it and the other Lees thrown out of the Tirnine each Time they boil : When this Vessel is full, they empty it into old Hogsheds, after having filter'd or pass'd them thro' spent Ashes and Straw : These Lees serve better to boil Yarn in, than fair Water can, and by their passing them thro' spent Ashes and Straw, they are purged from any Filth they contracted in the boiling or bucking, yet do they retain some Part of the Strength of the Ashes.

Their Method of bucking of Yarn is thus : They take twenty Pound of *Zuda* Ashes and the like Quantity of Ashes called *double Deprise*, with these they make a strong Lee ; and having placed one Range of their Yarn Hank by Hank, so as to cover the Bottom of the Chest, in the smoothest Manner they can possibly lay it, they gently pour over this Layer of Yarn, as much scalding Lees as will wet it quite through, then do they lay another Layer of Yarn, over which they pour Lees as before, and when there is occasion, they put the Planks to their proper Places, still as the Yarn and Lees rise higher in the Chest, and proceed to range the Yarn Hank by Hank, pouring on of Lees, over each Range, till the whole six hundred Weight of Yarn be compleatly stow'd in this Chest or Engine, which in *Holland* is called a *Lough-Bank*, whereto they have a Lid or Cover to keep in the Steam, which they are so exact to prevent its coming out that they stop up every Crevis in their *Lough-Bank*, and cover it all over very carefully with Cloths, so as neither the outward Air, or the inward Steam, should get in or out to obstruct the bucking.

Thus they continue their Yarn, for the Space of twenty four Hours compleat ; during which Time they having prepared another Lee, made of *Zuda*, and *double Deprise* Ashes, of each seven-teen Pound and a half, they let go the former Lees, and so pour

on the fresh ones, and there let them lye for the Space of twenty four Hours more, observing the same Cautions as before, to keep the Lees from evaporating: When the Yarn has lain thus long a bucking, they let go the Lees a second Time, and when it is cool'd, wring it very well in cold Water, and proceed to wring it on the Engine they have for that Purpose: When it is well wrung, they place their Poles in the Hanks about a Foot Distance from each Ley-band, and shake it and spread it on the Poles, so as the Yarn may lye as loose without ciinging together as is possible: They then spread the Yarn, Poles and all, on the Grass, for three Days and three Nights, turning it every Day, and afterwards hang the Poles and Yarn on the Horse, till it is perfectly dry; or if the Weather will not suffer it to hang on the Horse, they then hang their Yarn and Poles under their Pent-houses till it is compleatly dry, so as to weave it.

Thus may you perceive what Quantity of Ashes are made use of in the bleaching of six short Hundred of Yarn; but lest there might be a Mifs-computation or Mistake in this Matter, which is so essential to the Trade, I shall cast up the Quantity of the Ashes made use of on each Occasion: First, there are sixty Pound Weight of Ashes employed in the boiling of each hundred and twenty Pound Weight of Yarn, and there being five times that Quantity boil'd ere they buck; these Boilings take up three Hundred Weight of Ashes, & the twice bucking takes from seventy five Pound Weight to eighty, according to the Strength or Goodness of the Ashes, or the Yarn is more or less kindly in the bleaching; so that the whole six Hundred Weight of Yarn may be reasonably computed to take three hundred and eighty Pound of Ashes, which will sufficiently bleach this Quantity of Yarn, provided the Hemp was well saved and watered, and is of a kindly Nature in it self, for it may be hard and sullen, from some Imperfection in the Soil; in either of which Cases, the *Dutch* themselves are forced to give their Yarn a second Buck, ere they can bring it to that bright Colour they so much affect in *Holland*. I must here beg my Reader's Pardon, that I make this general Observation on the whole Matter, relating to the bleaching of hempen Yarn for Sail-canvas, That the Bleacher, and those employed under him, can never be over cautious or careful, that all Parts of their Yarn have equal Share of the Lees, both in boiling & bucking; therefore, the round Balls put into the Boiler, must not be drawn hard, so as to prevent the Lees piercing them through and through with Ease: It is true, the Ley-bands must be kept on each Hank, but not so straitly tied as to make the Yarn cling together; therefore, they lay their Hanks in the Lough-bank, and spread it as even and light as possibly they can, so as the Lees may penetrate each Thread of it in the bucking: And when they are to weather it on the Poles, they shake and divide each Thread from the other, so as no Part of it may cling together, for otherwise
some

Some of it would be rowy, and make Rows in the Canvas, which cannot afterwards be retrieved or cured.

The Names of the several Sorts of Ashes made use of by the Dutch, and the Prices they are sold for in Holland. viz.

Ellibanks — 8 and half Doyts per Pound.

Double Deprise — 10 Doyts per Pound.

Sattiens — 9 and half Doyts per Pound.

Cassoepe — 11 and half Doyts per Pound.

Kerrisouji — 10 Doyts per Pound.

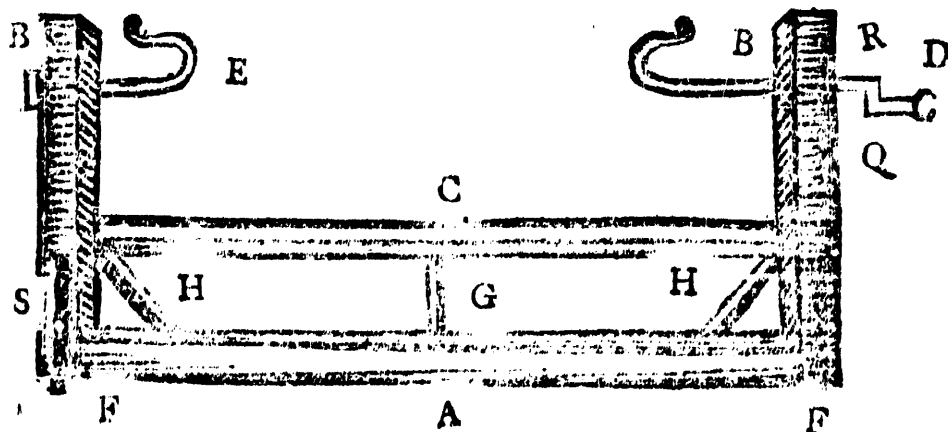
Zenda — 11 and half Guilders per Hundred.

I have already observed, that a Guilder contains twenty of their Stivers, and is equal to two Shillings *English*; their Stiver contains eight Doyts; so that it is an easy Matter to reduce their Money to ours of *England*, and afterward, that of *England* to ours of *Ireland*.

When they boil their hempen Yarn, they use an equal Quantity of *Ellibanks*, *double Deprise*, *Sattiens*, *Cassoepe*, and *Kerrisouje*, mingled all together; but when they buck, they use none but *Zenda* and *double Deprise* Ashes. All these Sorts of Ashes when used, must be well ground and sifted; or well pounded and sifted; when they grind them, they have Mills in *Holland*, which go in the Manner as the Stones do for grinding of Rape-seed; but some pound it, with a Beater made of a hard Piece of Wood, about twelve by fifteen Inches oblong square, and two Inches and a half thick, well shod with a Plate of Iron, about a Quarter of an Inch thick, with a Handle made after the Fashion of Mr. *Stator's* Beaters, for beating out Flax-seed; with this, they beat the Ashes on an old Mill-stone, or a large Flagstone fix'd in the Floor.

The Engine for wringing Yarn, its Description.

A. The Sill, 12 Foot long in the Clear, 12 by 9 Inches square, setled about 2 Foot in the Ground.



- B. B. The upright Post, 9 Foot long, 12 by 9 Inches square.
 C. The Trough to carry off the Water, by the Spout at S
 D. The Winlace 1 Inch and a half diameter, and about 3 Foot
 and a half long, made with a Shouldering at C 3 Inches dia-
 meter, with Teeth for the Catch R.
 E. The Hook, 12 Inches within the Upright, to answer the
 Winlace D.
 F. F. Two Braces put to the Sill and upright Posts of B. B.
 G. The Supporters for the Trough C.
 H. H. Braces from the Sill to the upright Posts, from A. to B.B.

The Use of the Engine for wringing of Yarn.

PUT one Hank of Yarn double over the Hook E keeping the two Ends open, through which they thrust another Hank, and so continue linking them together, till they will reach to hang on the Hook of the Winlace D. wring them very hard, and the Catch R. will hold them to the Degree they were wrung to, while the Wringer runs his Hands along the Yarn, to sweep off all the wet which remains on the Outside of the Yarn, to make it as dry as possible, then they put it on the Poles, as was before directed.

S E C T. XIV.

Of Weaving Sail-canvas.

THE *Dutch* weave their Sail-canvas in Looms, made much after the same Manner and Form as those are which are made Use of at *Dunkittle*, by Colonel *Edward Hoar* in his Factory, for the making of Sail-canvas, only the Scantling are somewhat larger in *Holland*, especially the several Beams made Use of in the Loom.

The Yarn-beams of each Loom are all contrived with Shoulderings at each End of them, in Proportion to the Breadth of the Canvas, which keeps the Yarn from Rolling from its proper Place ; by which Means they make the Selvages of their Canvas exceeding even and strong, and is of great Consequence to the Sails : These Shoulderings are rais'd about four Inches higher than the rest of the Yarn-beams ; their Tradles and Spring staves are linked together with Iron-links, and also their Seats are made with a Sloap towards their Tradles, so that the whole Weight of the Weaver lies on the Tradle, to keep it firm while he strikes the Woolf to its Place, with the Slay-board. I presume the *Dutch* Weavers now at *Dunkittle*, have thus fitted the Looms wherein they work ; but if they have not, it is requisite they should, for the Goodness of the Canvas very much depends thereon. The

The *Dutch* count the Number of Threads which compose each Beer by single Threads. but in *England* and *Ireland*, they are always counted by double Threads; therefore, when they in *Holland* are about to warp a Canvas of thirty Inches broad, they usually put from thirty nine to forty five Beers therein, according as they intend to stay higher or lower: But in *England* and *Ireland*, their Manner of the Count of the Beers is thus, that is to say, their thirty nine *Dutch* Beers make but nineteen and a Half of ours, and the forty five Beers of theirs makes twenty two and a Half of ours, for the Reason I have already given.

When the *Dutch* weave Sail-canvas, they make their Dressing of Buck Wheat-meal; whereas we make ours of Wheat. Theirs is much better, which is a great Defect in us, considering Buck-wheat would grow any where in *Ireland*, if it were cultivated, and be of great Use to other Purposes at well as this.

They do not tallow their Warp with hard Tallow, as we do, but they dress it with green soft Soap, which makes the Warp much more plyant than Tallow does, half a Pound of their soft Soap will dress a Bolt.

Their Manner of computing what the Proportion ought to be of Warp-yarn and Woof-yarn is thus: That is to say, they first compute how many Pound Weight of Warp and Woof-yarn the Bolt will take; then they apportion to the Warp, such a Weight, and to the Woof such another Weight; as for Instance, if a Bolt of Canvas is designed to weigh forty five Pounds, the Woof of it ought to be twenty seven Pound Weight, so as the Weight of the Warp, compared to the Weight of the Woof, is as eighteen is to twenty seven; so likewise, when a Bolt is intended to weigh thirty nine Pound, the Woof must be twenty two.

The Wages given in *Holland*, for weaving of Sail-canvas, is much the same with what is given at *Dunkittle*, viz. nine Shillings per Bolt, to ten Shillings, where the Sail-canvas is thirty Inches wide, and contains forty five Beers of theirs, or twenty two Beers and a Half of ours; but if the Canvas be thirty Inches wide, and contains only thirty nine of their Beers, or nineteen and a Half of ours, then they have only from seven to eight Shillings per Bolt for weaving. A Bolt of Sail-canvas in *Holland*, contains fifty *Dutch* Ells in Length, which is thirty seven Yards and a Half of our Measure, and each Bolt is sold there, from fifty eight Shillings to three Pound per Bolt.

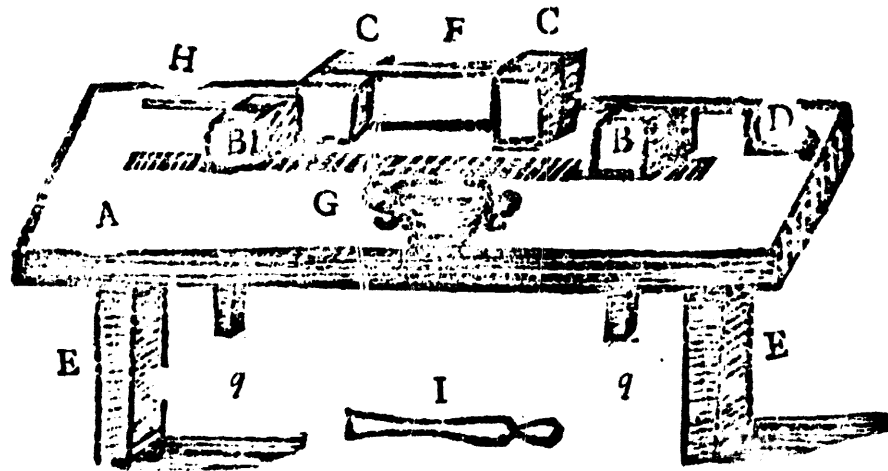
S E C T. XV.

The Method of making Brass-reeds for Sail-canvas.

In *Holland*, they make all their Reeds or Slays of Brass splits; for which Purpose they choose the toughest and clearest
H ground

Brass plates that they can get, being the tenth Part of an Inch thick: They then divide the Plate, marking out the Length of the Split, and cut so much off the Plate, from End to End. After this they divide this Piece of Brass plate, into so many Splits as they judge proper; and with a Hammer and File, they beat them out, and file them to a Truth, and set them in the Reed or Slay, in an Engine herein described.

- A. The Frame eight Foot long, eight by six Inches square, in the Manner of a Lath with Popots
- B. B. The two Popots about twelve Inches above the Frame with Tenent coming thro' at Q.
- C. C. Iron Clasps for fixing the Ribbs of the Reed F. with two Screws in each.
- D. The Screw with its Nut on B. and Swivel in C. to strain the Ribbs of the Reed F.
- E. E. The Standard for A. about three Foot and a half high.
- G. The Pot with Duff coal to melt the Wax-thread, when lapping in the Splits.
- H. The Center with a Batten swivel in C. to answer D.
- I. The Driver twelve Inches long, two broad and two tenths to drive the Splits close.



S E C T. XVI.

Of Sowing and Saving of Flax.

IN those Parts of the United Provinces where Flax is mostly cultivated, they choose their best Barley-grounds, therein to sow their Flax-seed; but these Sort of Grounds are with them so light, and at the same time so good, that with twice plowing and harrowing, they are better fitted or prepared for the Reception of either Barley or Flax seed, than any of our Grounds would be by

by four times that Labour: It is true, that their Grounds are naturally good, and probably in some measure better than ours; yet I cannot say but that there are many Grounds in *Ireland*, especially in the South Part of it, if they were as frequently turr'd up and enriched with Dung, Marl, Compost, &c. or other Improvements proper to the Soil, as is from time to time given to their Grounds in *Holland*, we might expect Crops of all Sorts, nothing inferior to theirs: For if their Grounds met with such lazy and unskilful Treatment, as the Generality of our Grounds here in *Ireland* meet withal; their Crops in *Holland*, would then be little better than ours: But as they have vastly more Hands to employ, in proportion to the Extent of their Grounds, than we have, and consequently their Farms are not so extensive as ours, their Labour is confin'd to a small Pittance of Earth, improved by Industry and Skill to the greatest Degree of Perfection that Agriculture can attain to.

The *Dutch* sow their Flax about the Middle of *April*, and when it is grown about six Leaves high above the Ground, they roll it with a Roller made eight Square, six Foot long: This Roller is drawn by a Horse, shod with broad leathern Shoes, to prevent his cutting the Flax as he treads thereon, or his sinking too far into the Soil. Their Way of judging when their Flax is ripe, is exactly the same with what *Mr. Stator* has set forth.

Their Manner of saving of Flax differs much from what is practis'd, either in *England* or *Ireland* that I know of; tho' as to the pulling of it, I did not observe that the *Dutch* pull the fine Flax, and the coarser Sort separately, as *Mr. Stator* very well advises; for certainly there is some Difference in point of rating them; however, the *Dutch* do not heed it, but when they have pulled as much Flax as they can well hold in their Hand, they lay that down and pull another Handful, which they lay across the first, till they have as much as will make a Sheaf, and there let it lye for six or seven Days to weather; then they turn the Inside out of their Flax, as they bind it into Sheaves; eight or ten of these Sheaves are by them placed on the Butts, in a round or circular Form, with the Heads leaning on each other, so as the Wind may pass thro' them: Thus they proceed with all their Flax, and leave it there eight or ten Days more, until it is perfectly dry; then carry it to their Barn, and riple in the Manner herein after described, such Part of their Flax as they design to riple that Season.

The Flax which they reserve for Seed, the *Dutch* never riple the same Season they pull it, but keep the Flax and Seed together till the ensuing Spring, and in the mean time, either house it or stack it, in such a Manner as may best preserve it from Rain or other Water, until they have occasion to sow it.

When they have ripl'd as much Flax as they design to riple that Season, they gather all the Boughs, and lay them up in round bundles with the Rubbish and waste Flax, and lay these bundles Side by Side on a plain Floor, paved for that Purpose; the Floor is about forty Foot square; they then bring the Carriage of a Wagon, drawn by two Horses, and thereon lay a considerable Weight; which Horses and Wagon they drive over these bundles, until they conceive they have broke the boughs & trod out the Seed; but lest there might be some Inequality in the Pressure, they very carefully turn the bundles, as the Horses and Wagon pass over them; this they continue doing, till they conceive that the whole Seed is perfectly trod out, and the boughs broke.

Their Manner of separating the Seed, with the broken Pieces of the boughs or pods from the grosser Part of Rubbish, is in this Manner: They have a large mesh'd Riddle, which is fix'd in a Frame contriv'd for that Purpose only, which suffers nothing to pass through it, but the Seed and the Shells of the boughs or pods; these they convey to an upper boarded Floor, and spread them as thin thereon as possibly they can, allowing as much Air thereto, as is requisite to keep the Seed from heating, and turn it every Day constantly, till the Seed be sufficiently dry: Afterwards they turn it every Week at least twice, till such Time as there is a Demand for it in the Market: Then have they Sieves made with a large Parchment Bottom, punch'd as full of small round Holes, as close and contiguous as can be, so as not to suffer the Flax-seed it self to pass through, but only the Dust and the Seeds of the Weeds: This done, they have another Parchment Sieve, punch'd with oblong Holes, through which they sift the Flax seed, and sever it from the Pieces of boughs or pods which till then the Seed was mix'd with: There is now at the Board of Trustees, one of each of these Sorts of Sieves, and a Sieve-maker may easily imitate them.

They have another Way in *Holland* of cleaning their Flax-seed, but it is very seldom used, neither does it clean Flax-seed so well as the Parchment Sieves do, therefore I decline describing them.

S E C T. XVII.

Remarks on the Ripling of Flax.

THE Reasons why the *Dutch* when they pull their Flax, lay the Handfuls across each other, and suffer it to remain for six or seven Days till it is weathered, before they bind it up in Sheaves, is that they may the better manage it when they riple, without breaking or bruising the Hart or Straw of their Flax; by this Means, each Handful clings together, and readily separates from

from the rest of the Sheaf when they are about to riple, for more than one Handful cannot be ripl'd at a Time.

In my humble Opinion, the ripling of Flax is much preferable to the thrashing of it in any Manner whatever, for the following Reasons: First, their Ripling comb not only severs the Boughs or Seed-pods from the Flax, but it also severs the Leaves and Branches from it, which thrashing cannot do, the same Season it is pull'd. Secondly, the Flax lies better in the Water, & spreads more easily on the Grass, when by ripling, the superfluous Branches are removed; and it likewise swingles better.

I have already observ'd how careful the *Dutch* are, not to sever the Seed which they intend to sow themselves, from the Stalks of the Flax, till the ensuing Season for sowing it: Their Reasons for so doing are, that they conceive the Seed is not only less liable to heating, but that it likewise attracts further Nourishment from the Stalks, than what it had when pull'd. In *Holland* they seldom sow themselves any of the first ripl'd Seed, but convert it either to Oyl, or export it to foreign Markets.

Many are the Devices and Tricks which the *Dutch* put in practice with their export Flax-seed: First, they are not always very careful that the Seed they export, be all of it well preserved from heating on the Floor or in the Cask: Secondly, if they have any old Seed by them of a former Season, which has slip't the Market, they make no Scruple of mixing it with the fresh Seed; neither do they scruple to mix decayed or degenerated Seed with their fresh Seed: Thirdly, the *Flemings* set little or no Value upon their Seed, save only such Seed as they reserve for their sowing; therefore pull their Flax before the Seed is half ripe, that the Flax might work so much the finer; these Seeds the *Dutch* buy from them, and mix with their own, in such Proportion as not to be easily discern'd by the Buyers: Fourthly, the *Dutch* supply themselves from *Riga*, *Nerva*, or other of the East-land Countries with Flax-seed, from time to time as they have occasion; but because the East country Flax-seed is universally mixed with the Seeds of the Weeds which grow along with the Flax, they are very careful to separate the one from the other; they keep the good Seed to themselves, but they never fail to make their foreign Customers pay equally for these Seeds of Weeds, as they do for their best Flax-seed; for they divide them constantly into each Cask or Hoghead which they export: And if they intend to impose their own Seed on the Buyer, they mingle these Seeds of Weeds with some of their own Flax seed, and cask them up in small Casks, containing three bushels and a half, in Imitation of those made use of in other Countries.

Thus are Foreigners who deal with the *Dutch* for Flax-seed impos'd on, and I cannot think of any Expedient to prevent it, unless the Board of Trustees find out some Way to have this Kingdom supply'd with the East country Flax-seed, in as cheap
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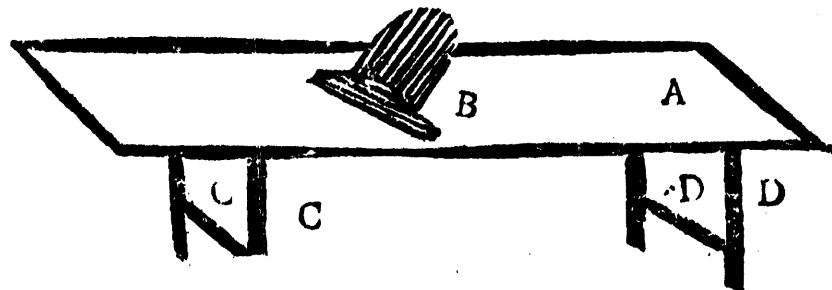
and beneficial a Manner as the *Dutch* are : Our People here may soon learn to separate the Flax-seed from the Seeds of the Weeds, in the same Manner as the *Dutch* do, by the Means of their Parchment Sieves; or these Seeds may be separated by the Care and Diligence of the Factors, in those Countries where the Seed is bought; whereby the Expences of Casking, Freight, Portrage, and other incident Charges, may be very much lessen'd or saved, and these noxious Weeds kept out of our Country, and not foul our Grounds as they will infallibly do, unless each Flax-man be very careful and diligent, ere he sows his Flax-seed, to cleanse it from all other Seeds.

The most pernicious of all these Weeds, is that which is called in *England*, Heighop: I know not by what Name it is called here, but the Weed it self grows among the Flax, and twines it self about it, as Hops do round a Pole; by which Means, the Harf of the Flax is cut or tewed, or else makes it so rotten, that it won't work. It is hard to distinguish at weeding Time, this plaguey Weed from the Flax; the Seed of this Weed is easily distinguished from the Flax-seed; for it is shaped like white Mustard-seed, somewhat less in Size, and of a bright yellow Colour.

In *Holland*, when they sell their Flax-seed to the Oyl-mills, they generally sell it at thirteen Guilders per Hoghead, which is twenty six Shilings *English* Money.

A Description of the Ripling comb.

- A The Bench eight Foot long, fifteen Inches broad, and two Inches thick.
- B Is the Comb it self, the Teeth whereof ought to be of Iron, and fifteen Inches long; the Edges of the Teeth ought to stand directly opposite to each other, the better to catch the Boughs of the Flax as it is ripling.
- C. C. D. D. Are the Feet with their Braces, which support the Bench, and are about two Foot and a half high.



The Method observed in *Holland* in ripling of Flax, is thus : They first spread a large wanning Sheet on the Floor, over which they place their ripling Bench, to which Place they bring the Sheets of Flax, in order to be ripled; then two Men mount
the

the Bench, or sit astride thereon, one on the one Side, the other on the other of the Comb, each of whom is served by a Person, whose Care is to open the Sheaves, and to hand to his Ripler the Handfuls of Flax, of which the Sheaf was composed, and I formerly mentioned : And as the Ripler ripples that Handful, the Person who tends him receives that back again, and supplies him with another Handful. The rippled Flax is laid by it self, observing still to keep the Handfuls together, till they have a sufficient Quantity wherewith to make a Sheaf ; then the Person who tends the Ripler, binds it into a Sheaf about three Quarters of a Yard in Circumference : When they have thus rippled all the Flax they design to riple that Season and bound it into Sheaves, their next Care is to rate it.

But before I proceed to acquaint you with their Manner of rating, it is requisite I should inform you, that the *Dutch* are very curious and neat in the making of all and every of their Engines, so as they might best answer their Purposes in every Respect ; therefore in the making of this Ripling-bench, they do not make it flat at the Top, but on the contrary, make it as round at the Top as they conveniently can, to the End the Persons that sit upon them, might sit with Ease, and each of them strike their Handful of Flax into the Comb alternately ; by which Means, they riple their Flax with fewer Combs, and with greater Dispatch than otherwise they could do. There is yet a further Convenience in the rounding of this Bench, which is, that neither the Seed, Leaves, nor Branches of the Flax lye on the Bench to cumber it, but constantly fall on the Winnowing-sheet, as the Riplers proceed in their Work.

SECTION XVIII.

The Manner of Rating of Flax in Holland.

THEY always choose in *Holland* standing Water for rating Flax in ; and to the End they may perform their Work with the utmost Exactness, they measure the Depth, the Breadth, and the Length of the Water they design to employ ; they know by the Number of the Sheaves of Flax, what Space they shall fill ; they generally rate their Flax in the Dreins about their Lands, which for the most Part are from eight to ten Foot deep, and from ten to sixteen Foot wide, more or less, according as their Land is, swampy or wet.

Those Sheaves that they design to lay in the Bottom of their Water they tie with strong bands, within six Inches of each End of the Sheaf. Then draw some strong Twine through the middle of the Sheaf, between the Bands : With this Twine, they tie their Lands Sheaf by Sheaf, till they have formed a Platform of
equal

equal length and breadth with the Water they rate in. This is always done on the banks of the Water; and when they have stitched together as many of these Sheaves as is necessary, they shove the whole Platform into the Water, which floats thereon; whereby they have an Opportunity to lay another Range of Sheaves athwart the other, till they have compleatly covered their Platform: They constantly observe in rating of their Flax, to lay first the Platform with their Flax, the long Way of the Canal: The next Range of Sheaves is laid across the Canal; and so they proceed alternately, till their Flax is piled up as high as they design to raise it: but to the end they might sink it gradually, they always stand on their Flax in the Water, after they have laid two or three Ranges; by which Means, they are readier in the placing of the Sheaves on the Pile, till they conceive that the Pile of Flax when sunk, will be about fourteen Inches under the Surface of the Water; and because they have no Stones in the Country, to sink it withal, they are forced to sink it by the Weight of such Slush or Mudd, as they can get from the Bottom of their Drains.

When their Flax has been in Water about four Days, they thrust their Arm as far into the Water as they can, and draw forth a Handful of the Flax by the Butts, which they spread thin on the Grass: If they observe when this Flax is dry that it is sufficiently rated, they then raise all their Flax from out the Water; but if they perceive it is not sufficiently rated, they repeat this Experiment twice a Day, until they are satisfied that the whole is watered enough: Their next Care is to discharge it of the Mudd and Slush that was on it, and raise their Flax, Sheaf by Sheaf, till they have taken it all out of the Water; yet as they raise it, they never fail to rinse each Sheaf in the Water, to cleanse it from the filth it contracted in the Water, as it lay therein, purging and fermenting.

Having thus rais'd their Flax, and cleansed it, they open the Sheaves, and spread their Flax as thin on the Grass, Row by Row, as Mr. *Siator* has mentioned; where they never suffer it to lie more than two Days, in order to stiffen it, unless they perceive some Part of it to have been under-rated: In which Case they leave such Part on the Grass till it be sufficiently rated; but if they find on the grassing of their Flax, the Water has had its Effect, they (after two Days Time) gather as much of the Flax as they conceive will make a Sheaf; this they open very wide at the Butt, in the form of a Bird cage, giving the upper End a little Twist, to make it cling together: Thus they set all their Flax thro' a whole Field, Sheaf by Sheaf, in Rows; and if any happens to be overturned by the Wind, they set it up again; and there let it stand, till it is sufficiently dried and weathered.

S E C T. XIX.

Reasons why Flax ought to be rated in running Waters.

IF Water has any great Currency through Flax, it will fret and tear the Harl to such a Degree, that allowing it should not spoil the whole, yet will it cause so great a Waste in the working, as that the Owner will be a great Sufferer thereby; but further, the Harl which remains untorn will not be worth the working, it will be so very hard and wery. In proof of what I here assert, be pleas'd only to observe, that whenever Oak or solid Timber is cut down when the Sap is in it, be the Beams never so large; if you place them for two or three Months in running Water, the Sap will be as effectually wash'd out of the Timber, as if it had been cut down in the Depth of Winter: And if running Water has such Power over large Logs of Timber, what must its Power be over so tender a Plant as Flax is. There is yet a further & more essential Reason why Flax ought not to be watered in a running Water, which is this, the Water running through the Flax will keep it so cold, that it would never ferment. Now Fermentation is as requisite to make the Flax purge it self from the Filth which it brings with it from the Soil, as any thing which happens in the rating: Therefore a skilful Flax-man uses his utmost Industry to keep his Flax under Water while this Fermentation lasts, that all the Flax may partake thereof.

I would not be understood by this, as if I were for encouraging the pernicious Practice of rating Flax in Bog-holes, too frequent in *Ireland*, which I fear occasions the Rows in their Linnen, and the dark and sullen Cast which commonly attend the *Irish* Linnen, though the Bleacher has performed his utmost Skill; for it is evident that Turff mold will always stain the Water which stagnates or stands therein; and tho' Water which stands in stiff Clay is not liable to this Objection, yet I would not have it altogether stagnated Water, but have my Rating-pond so contrived, that I could give it a Recruit of fresh Water gradually, or by such Degree as might neither occasion a great Currency of the Water in the Pond, or prevent the Fermentation of my Flax.

Lough-water (in those Parts of this Kingdom where it can conveniently be had) if it will bear Soap, is preferable to any Ponds whatever; because those Waters are better weather'd than any other, and consequently more soft: But where Lough or Lake-water can't be had, it is then of absolute Necessity that Ponds be made, after such a Manner as to be sufficiently supply'd at all times, with Water drawn from Rivers or Brooks. I see no Reason why the Rating ponds should be made so narrow as Mr. *Shlor* has

has directed ; for if they be made ten or twelve Foot wide, consequently the Pile of Flax will be so much the larger, and the Fermentation quicker and more effectual : The Charge will be much the same, provided the Soil be free from Rocks, which of all Things must be avoided in Rating-ponds. And as to the Depth of them, they ought never to be less than five or six Foot deep, nor more than ten.

S E C T. XX.

The Reasons why the Dutch do not grass their Flax, so much as in England or Ireland.

THE *Dutch* having stiffened their Flax on the Grass, they raise it on the Butts, and open it as evenly as they can possibly at the Butts, in order to give it all the Benefit and Advantage it can have from the Sun, the Wind, and the Air. They judge that it is the Water which rots the Bunn or Straw of the Flax, and causes the Harl to separate readily from it. They are very fond of having their Flax of a beautiful Colour which they conceive they can't have, if their Flax be suffered to lie long on the Grass, which would infallibly grow through it, and consequently would shade the Flax, and prevent the Air from passing so readily thro' it, as it would otherwise do, when placed (as aforesaid) on the Butts. They likewise judge, that whatever Rain or Dew falls, in the aforesaid Position, will sink readilier down to the Earth, and less hinder the Bunn from drying, than it will when laid flat on the Grass. For my own Part, I am humbly of Opinion, that this Way of Management, were it put in Practice in *Ireland*, would turn to good Account. In point of Colour of their Linnen, there stands one Objection in the Way of this Practice, which must be obviated, else I fear *Ireland* can scarce comply with it ; for should any great Storms of Wind catch the Flax thus erected on the Butts, it would have much more Power over it, and be apt to mingle their Butts and Ends so together, as it would create a vast deal of Trouble in the setting all right again ; for to be sure, the Butts of Flax or Hemp must be always kept together, else it could never be dress'd ; therefore the Season or Time of the Year when Flax is grassing and weathering, after it is rated, ought to be very well weigh'd and considered ; for should it be during those great Storms which are vulgarly called in *Ireland*, the *Michaelmas* Rigs, it would be impossible to raise Flax in the Manner practis'd in *Holland*, or indeed to grass it flat on the Ground, without being toss'd and tumbled by the Storms. The only Way to remedy this Evil is, to sow early in *April*, that the Flax may be the earlier ripe, pulled, and rated, ere these Storms usually happen.

S E C T. XXI.

Of the Management of Flax reserved for Seed.

I Have already acquainted you, that the *Dutch* never sever the Seed which they themselves intend to sow, from the Flax, the same Season it was pull'd in : therefore when they are just ready to sow, they fall to ripling of it as fast as they can, and cleanse the Seed from all its Filth and Seeds of Weeds, in like manner as they did the former ; then do they either rate the Flax immediately, in the Drains which they have in their Grounds, or defer the rating it, till they fall to rating of the ensuing Crop ; but they never rate them both in the same Pile, because the Seed-flax will take somewhat longer Time to rate it in, than the other ; but in all other Respects it is managed exactly conformable to the other ; and if the Flax-man be skilful that rates it, I could never observe much Difference between either the Goodness or Colour of the Flax, the one from the other.

S E C T. XXII.

Of Breaking, Swingling, or Scutching Flax.

THE *Dutch* before they break their Flax have a large Oven, which they make so Warm as they can put their Flax with Safety therein, placing it on the Butts ; having first untied the Sheaves, they stop the Mouth of this Oven as close as possible and there let the Flax stand for the Space of twelve Hours to sweat ; this done, they remove it thence, and bind it into Sheaves as large as they please, and cover these Sheaves with Cloths as close as they can, and there let it lye for six Hours more. The Way they have to judge whether the Oven be in Temper or not, is by putting in a Handful or two of their Flax on the Butts into the Oven, ere they venture to expose any Quantity of Flax therein ; and accordingly they either encrease the Heat, or suffer the Oven to cool till it is in Temper.

When Flax has been thus managed, during eighteen Hours, they apply themselves to the breaking of it ; which they do in Breaks made with three Bars under, and two above ; the Mash of their Breaks is made shallower than those generally made in *England* or *Ireland* ; the Rollers of theirs are square, and not rounded off as ours are, which keeps their Work tighter and steadier than ours do ; their Breaks are somewhat shorter than ours ; which has a good Effect on their Flax, because they can manage them more nimbly and readily, and whip their Flax and turn it under

the Break, so as to break and squeeze the Bunn to Pieces ; and the Mass of their Breaks being so shallow, the Harl runs no Risque of breaking or tearing.

This Practice in *Holland* of thus baking their Flax, is not only very rational, but expedient to be imitated ; because it is freed from all Inconveniencies of Fire or Smoak, which generally attends the kilning or drying of Flax over Fire ; and at the same Time, it makes the Bunn to break, and the Harl to separate readily in the swingling, and not run so much to Tow or Backings, as otherwise it would.

The Scutching-boards which they make use of in *Holland*, are much the same with those we of late make use of in *Ireland* ; but their Scutching-handles differ much from ours, as appears by the Figure. They break and scutch six Pound of Flax for five Stivers which is equal to our *English* Six-pence ; so that it amounts exactly to a Penny a Pound, which is much after the same Rate that is paid in *Ireland*, to the most skilful of our Swinglers.

S E C T. XXIII.

Of Hackling of Flax.

TH E Y generally hackle their Flax in *Holland* by the Women, who are exceedingly skilful and dextrous therein : Their Hackles are much finer than those which came from *Coven-try* ; yet I have seen some made here by Mr. Taylor, which he called his superfine Hackles, which are as fine as any I ever saw in *Holland*. I see no Reason why the Women here might not be instructed to hackle as well as the Men ; the Labour is not so great, but that the Women might undergo it. As to the breaking, swingling, or scutching, that I must acknowledge to be laborious ; yet every Boor in *Holland*, and every good Husbandman in the Isle of *Axom* in *Lincolnshire*, not only raise great Quantities of Flax and Hemp annually for Sale, but they likewise rate, break, and swingle it, either by themselves or their Labourers very skilfully. And I am the more inclined to wish that young Girls were taught to hackle in *Ireland*, to that Perfection they ought to be instructed ; because it will be much easier to persuade young Girls to apply themselves to that Sort of Work, than it has hitherto been found to persuade Boys : And as a great Share of the national Profit arising from the Linnen Manufacture depends on the well or ill hackling of Flax, it should seem to me to be expedient to lose no Time in the teaching and instructing Girls, as well in hackling as in spinning.

raising of FLAX.

S E C T. XXIV.

Of the Spinning of Flax.

THEIR Wheels in *Holland* are much after the same Form with ours in *Ireland*, called *Dutch* Wheels; only they are made firmer, and the Rims heavier: The Axis on which it turns, altho' it be made of Iron, as ours are, yet is it turned in a Lath to a Truth: Whereas every bungling Smith in *Ireland*, pretends to bring it to a Truth by a File, which is scarce practicable.

Flax-wheels require to be made with an exact Proportion between the Wheel, the Whirl, the Spool, and the Flyers. I have endeavoured to inform my self of the true geometrical Proportions of each of these, by discoursing with the ablest Wheel-wrights that I could meet with, wherever I came; but it has been hitherto all in vain: For either they could not, or would not tell how and in what Manner this Mystery in the Trade, might be brought to a more mechanick Regulation than at present it is under.

These Observations might have great Influence on the Improvement of spinning Linnen-yarn in *Ireland*; for if the Wheels and Axes be made to a Truth, and a just Proportion observed between the Wheel, the Whirl, the Spool, and the Flyers, the whole will move regularly without hobbling; the Yarn will be equally twisted, and it must be the Spinner's own Fault, if the Yarn has not a proper Twist: It is certain, that Yarn designed for Warp, ought to have somewhat more Twist than Yarn designed for Woof, because the latter ought to be more plyant and readier to yield to the Slay, and is easier struck up; for which Reason, a skilful House-wife's Bolt of Linnen-cloth is, generally speaking, preferable to a Master-weaver's Bolt, of the same Degree of Fineness, because she has taken Care to give a proper Twist both to the Warp and Woof.

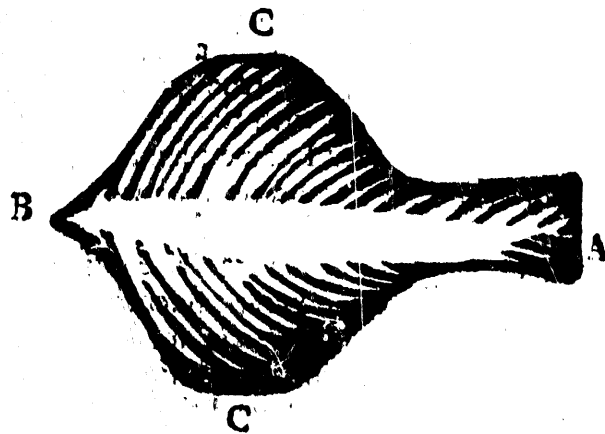
The Spinners in *Holland* have a Piece of fine woollen cloth, passed round the Rock, purposely to prevent the Flax from coming down too fast, as the Spinner draws: Besides, they have a Piece of Oyl-leather, which they bind gently over the flax, while it is tied to the Rock, to prevent its drying too fast, and to preserve it from Dust.

Of cultivating and

S E C T. XXV.

The Description of the Scutching-handle.

THIS Instrument is commonly made of Walnut ; from A. to B. is about sixteen Inches ; four of which are taken up in the Handle, from C. to C, nine Inches. There runs a Rib in the Middle, from the Point B. down to the Handle, falling off thin towards the Edges at C. C. as per Shade on the side Side C.



S E C T. XXVI.

Of Bleaching of Linnen-cloth, Tarn, Thread, &c.

I Have been twice of late Years in *Holland*, to inform my self the best I could, of all and every the Mysteries and Practices in *Holland*, in Bleaching of Linnen-cloth, Linnen-yarn, Thread, Tape, &c. I have the Vanity to believe, that there is not one Branch in the whole Bleaching-trade that I have not acquired the Knowledge of in Theory ; but as to the practising it my self in that Country, I could by no Means attempt the doing it : For it is well known to all Persons conversant of late Years in *Holland*, that the *Dutch* are very jealous of the Endeavours used in *Ireland*, to compass flaxen and hempen Manufactures ; they are aware of the Benefits which will accrue not only to this Kingdom, but to all His Majesty's Dominions thereby ; and the immense Loss it must be to themselves, should the People of this Kingdom attain to the Perfection which they in *Holland* have attained to, with great Labour and Industry, during these two last Centuries.