FLAX, *n. s.* } Sax. fleax, flex; Goth. *fleaks*; Teut. *flachs*; Belg. *vlasch*. Quære from the Goth. *floa*; Sax. flowan, to flow, from its fibrous texture. The plant from which linen is made; the fibres of that plant prepared for the spinner: flax-comb is the instrument whereby it is cleansed: and flax-dresser he who cleanses or prepares it: flaxen, and flaxy, made of, flowing like, or being of the color of, flax.

FLAX'-COMB, FLAX'-DRESSER, FLAX'EN, *adj.* FLAX'Y.

The four colours signify four virtues. The *flaxy* having whiteness appertains to temperance. *Sandys.*

I'll fetch some *flax*, and whites of eggs,
T' apply to's bleeding face.
Shakspeare. King Lear.

Then on the rock a scanty measure place
Of vital *flax*, and turn the wheel apace,
And turning sung. *Dryden's Ovid.*

I bought a fine *flaxen* long wig. *Addison.*

The best materials for making ligatures are the *flaxen* threads that shoemakers use. *Sharp's Surgery.*

The matron, at her nightly task,
With pensive labour draws the *flaxen* thread.
Thomson's Winter.

Five sister-nymphs with dewy fingers twine
The beamy *flax*, and stretch the fibre-line;
Quick eddying threads from rapid spindles reel,
Or whirl with beating foot the dizzy wheel. *Darwin.*

FLAX, the linum usitatissimum of Linné, has been cultivated in this country, and in most civilised countries, from time immemorial, both for its fibre in making thread, and for its seed, occasionally, as yielding a serviceable oil. The common flax has scarcely any varieties worth remarking. The blue or lead-colored is mentioned by Marshall as being cultivated in Yorkshire; and professor Thaer mentions a finer and coarser variety; he also, as well as some other writers, has tried the *linum perenne*, but the fibre is coarser, though strong, and with difficulty detached.

Flax, for fine lawn and cambric, is recommended to be sown on a rich light soil, previously well prepared by ploughing and made level like a garden. As the soil cannot be too rich, it ought to have at least double the quantity of seed commonly sown by farmers; and, when sown in dry weather, the ground should be immediately rolled. The lint should be carefully weeded when about three inches high; after which forked sticks are to be stuck in the ground, so as to receive poles from ten to fifteen feet long, six or seven inches above the lint. Each row of poles should be three or four feet asunder, so as to support a layer of brush-wood, laid as thick and level as possible. The brush-wood may be of any sort except oak, which tinges the lint; but none of the branches must be left sticking higher than eighteen or twenty inches above the lint. The brush-wood, when the flax springs up, catches it by the middle, and prevents it from lying down and rotting; infallible consequences of sowing thick upon rich ground. It also keeps it straight, moist, and soft at the roots; and, by keeping it warm and shaded from the sun, greatly promotes its length. It must be pulled as soon as the seed is fully formed, before the lint turns yellow; and thus, instead of that coarse hardness, which flax has when let stand till fully ripe, it acquires a fine silky property. It must be pulled above the brush-wood, and every handful laid upon it as soon as possible: in fine weather it may be left four or five hours in that manner; after which it should be conveyed to a shade near a barn, where it may be spread for four or five days, always putting it in the barn at night, or on the appearance of rain. When in the barn, every precaution must be used to prevent it from heating; and if it happen to get rain or wet, in the course of these operations, which must be continued till it is perfectly dry, it should be allowed to dry in the open air; for, if put under cover when wet, it is apt to turn black, which must be carefully guarded against, as this is a principal cause of those bars so much complained of by bleachers. In all these operations, the roots should be kept as even as possible; and if any coarse lint be discovered it should be separated from the rest. As it is a principal object to preserve the lint entire, or unbroken, the bolls are beat off with a round mall or beetle. When it is intended to water it immediately, it is next tied up in bundles about as large as a man may grasp in his two hands. The pit ought to be dug three or four months before it is used, about five feet deep and seven or eight broad, the length according to the quantity of flax to be watered. The water should be soft, and free of any metallic ore; and no flood or foul water should be allowed to enter the pit; but a small stripe of clear water should always run in and off from it while the lint is in it. Along the sides of the pit, hooks of this form ⊐ must be driven in at about five feet distance, so as to hold a long pole under the surface of the water; after which the lint must be made up into bundles, laying the sheaves head to head, and making each to overlap the other about one-third. When they are thus built, till the bundle is about four feet or four feet and a half high, it is then tied in the middle and at each root end, wrapped in straw and put into the water, with the thin or broad side undermost. The lint being thus put into the water in distinct bundles, so as they may be easily taken out, cross poles are put in with their ends under the long ones in each side of the pit, so as to keep the lint three or four inches under water, but without any of it touching the ground.

The soils generally most proper for flax, besides the alluvial kinds, are deep and friable loams, and such as contain a large proportion of vegetable matter in their composition. Strong clays do not answer well, nor soils of a gravelly or dry sandy nature. But, whatever be the kind of soil, it ought neither to be in too poor nor too rich a condition; because, in the latter case, the flax is apt to grow too luxuriant, and to produce a coarse sort; and, in the former case, the plant, from growing weakly, affords only a small produce. If there be water at a small depth below the surface of the ground, it is thought by some still better, as is the case in Zealand, which is remarkable for the fineness of its flax, and where the soil is deep and rather stiff, with water almost every where, at the depth of a foot and a half or two feet underneath it. It is said to be owing to the want of this advantage, that the other provinces of Holland do not succeed equally well in the culture of this useful plant; not but that fine flax is also raised on high lands, if they have been well tilled and manured, and if the seasons are not very dry. It is remarked, in the letters of the Dublin Agricultural Society, that moist stiff soils yield much larger quantities of flax, and far better seed, than can be obtained from light lands; and that the seed secured from the former may, with proper care, be rendered full as good as any that is imported from Riga or Zealand. M. du Hamel, however, thinks that strong land can hardly yield such fine flax as that which grows on lighter ground.

Mr. Donaldson observes, that flax is sown after all sorts of crops, but is found to succeed best on lands lately broken up from grass. And that in Scotland, the most skilful cultivators of flax generally prefer lands from which only one crop of grain has been taken, after having been several years in pasture. When such lands have been limed or marled, immediately before being laid down to grass, the crop of flax seldom or never misgives, unless the season prove remarkably adverse to it. It succeeds in general much better after green crops, than those of the grain kind.

The land, in order to render it fit for the growth of this sort of crop, requires to be rendered perfectly fine and mellow, by being repeatedly ploughed over, and broken down by severe harrowings. When grass land is to be broken up for this crop, it should be done in the autumn, and left exposed to the influence of the atmosphere until the early part of the following year, when it should be well pulverised and broken down by heavy harrowing; then, in the course of a week or two, ploughed again, in which state it may remain till the period of putting in the seed, when another light harrowing should be given, and the ploughing performed afterwards by a very light furrow. But in cases where the crop is sown after grain, or other crops that have the property of keeping the land clean from weeds, the first ploughing need not be given till January, when it may remain in that situation until it becomes pretty dry in the early spring, being then well reduced by good harrowing and rolling; and, after continuing in that state about a fortnight, the seed may either be immediately put in, or another light ploughing and harrowing be first given.

With regard to the choice of seed, the same writer states, that that which is of a bright brownish color, oily to the feel, and at the same time weighty, is considered the best. Linseed, imported from various countries, is employed. That brought from Holland is, however, in the highest estimation, as it not only ripens sooner than any other that is imported, but also produces greater crops, and flax of that quality which best suits the chief manufactures of this country. American seed produces in common fine flax; but neither the quantity of flax, nor of the pods, provincially the 'bolls,' which contain the seeds, is so large as the produce from Dutch linseed. The Riga seed yields a very coarse sort of flax, but a greater quantity of seeds than any other. It is common in some parts of Scotland to sow seeds saved from the crop the preceding year, especially when the crop was raised from seed imported from Holland. The success of this practice is found to depend greatly on changing the seed from one sort of soil to another of an opposite nature; but the saving in the expense of purchasing that sort of seed, in place of what is newly imported from Holland, is so inconsiderable, and the risk of the crop misgiving so much greater in the one case than in the other, that it is supposed those only who are ignoraut of the consequences, or who are compelled from necessity, are chargeable with this act of ill-judged parsimony in the business.

In Ireland the cultivators of flax prefer the American seed for the lighter and more elevated and exposed lands; but the Baltic or Dutch for those which are of a heavier quality. The seed of home produce is often sown for white flax in Yorkshire; but the Baltic sort is mostly preferred where seed is the object; which, for the ensuing year, and one or two afterwards, is found to answer as well as white flax. But it is highly probable that, if that which has been collected from the perfectly ripened seed of our own growth be made use of, it will be equally productive in both the flaxy substance and the quantity of seed, and the former be equally valuable for all the purposes of the manufacturer.

Proportion of Seed.—In respect to the quantity of seed used, it varies in different places according to the circumstances of the soil, the method of sowing, and the uses to which the crop is to be applied; but from two bushels, to two bushels and a half, the English statute acre, is the ordinary allowance. In determining the proper quantity necessary for the acre, it is requisite to pay great attention to the condition of the land. When the land is rich and fertile, and the season so favorable that it can be got thoroughly pulverised, if too much seed is sown the crop is in great danger of lodging; and when that happens, particularly before the pods are formed, the flax proves inconsiderable in quantity, and very inferior in quality. When cultivated in the drill mode, at narrow distances, a much less quantity will be sufficient than in other cases; and where the intervals are large, scarcely one-half the quantity is required. When the crops are intended for seed, in whatever

manner the sowing is performed, much less will be necessary, than where flax is the main object of the grower.

The *time of sowing* it must depend much upon the soil and situation; but the ordinary season of sowing flax-seed is from the middle of March to the middle or end of April; but the last week of March, and the first ten days of April, are esteemed the best times; and accordingly within these periods the greatest quantity of flax-seed is sown in this country. In the county of York, where this sort of crop is grown on land broken up from grass, the seed is commonly sown before the second week in April, where it can possibly be done; while, on such lands as have been in a previous state of tillage, the sowing is frequently deferred a week or ten days longer. Wherever it can be safely practised, early sowing has the advantage of getting the flax plants to cover the surface of the land well, before they can run much risk of injury from the rising of weeds, or the parching effects of heat. In some of the southern counties of Europe, however, the husbandmen who raise flax, sow part of their seed in September and October; so that the plants which spring from thence remain of course in the ground all the winter; and this may be a judicious practice in those places, because plants which have not covered the earth well before the summer heats come on are apt to be parched by the heat and drought which usually prevail in that season. They sow linseed again also in the spring; but the latter does not yield so large a crop; the flax, however, which it produces is more esteemed, because it is finer than that sown in autumn. M. du Hamel seems indeed to think, that the autumnal sowing yields the best seed; but however that may be, in places where the winter is apt to be severe, and where the flax, which is but a tender plant, would in course be in danger of being destroyed during that season, almost all the flax is sown about the end of March, or in the beginning of April, as already stated.

The land which is intended for flax crops should be brought to an exceeding fine tilth, in the way directed above, before the seed is put in. When pasture lands are broken up, in order to their being sown with flax, they must be well wrought during several months, before they will be fit for producing such crops, in the manner just described. To defray the expense of this culture, some other crops may be got off the land in the mean time, especially of such plants as do not occupy it long, and particularly of those which are remarkably benefited by frequent stirring of the earth whilst they grow; such as beans, peas, turnips, &c., because these repeated stirrings render the mould fine and loose, and help to kill the weeds, which would otherwise do great damage to the flax. It is asserted, that the Livonians, when they clear woodlands, burn the wood upon them, then plough them, and in this state prefer them to any other kind of soil for flax crops. If the land which is intended for flax be stiff, great care should be taken not to work it when it is wet, for fear of kneading it; but it is often an excellent plan to work it deeply before winter, when dry, laying it up in very high ridges, in order that the winter frosts may the more effectually moulder and loosen its parts. In the month of February, where the land is not too wet, some very rotten dung should be laid on, and immediately covered over with the mould. The seed should afterwards, at the proper season, be sown, and harrowed in with a light or bush harrow, so as not to bury it too deep. As this, when young, is a very tender plant, and is more easily injured and checked in its progress by weeds than any other that is usually cultivated in the field, it is indispensably necessary that the danger of injury in this way should be well guarded against, in order to save future trouble and expense.

Where the principal object of the grower is flax, the most general method of putting in the crops is that of sowing them broadcast over the surface of the land. In performing the business, much care is necessary that the seed be dispersed as evenly as possible over the ground, to prevent the plants rising in an unequal or tufty manner. It should be afterwards covered in by regular harrowing, once or twice in a place, with a light common or bush-harrow, as just noticed, not covering it in too deep. But, where the seed constitutes the chief intention of the cultivator, it is contended by some that the drill mode is preferable, as requiring much less seed in sowing, and affording a much better and more abundant produce. Besides, the smoothness and weight of the seed render it extremely proper for being drilled; and the crops can be kept clean with greater facility.

In this method, the distances of the rows or drills should vary according to the circumstances of the soil, and the manner in which the crops are to be kept clean. Where the hand-hoe is to be chiefly depended upon, narrow distances may be proper, as ten or twelve inches; but, where the work is to be principally executed by the horse-hoe or cultivator, larger intervals may be more suitable, as those of eighteen or twenty inches. Slight harrowing and rolling are sometimes afterwards necessary, especially the latter, in dry seasons. It has been observed that thick sown flax runs up in height, and produces fine soft flax; but that when sown thin it does not rise to such a height, but spreads out more, sending off a greater number of side branches, which produce a great abundance of seed which is much better filled, more plump and heavy than that which is produced from thick-sown flax crops. Flax crops cultivated in this way are not so liable to be beaten down in bad weather, the stems being stronger and better fortified by the more free admission of sun and air among them; and they are not so much exposed to danger in weeding or cleaning the rows.

Where flax crops are sown in the broadcast method, they are seldom much attended to afterwards: it is, however, highly useful and necessary that they should have one good hand-hoeing, or weeding, as soon as ever the crop is sufficiently up; care being taken not to injure the plants by too much treading amongst them. In the drill manner of sowing, the after-culture of the crops must be regulated by the distance of the rows; but they may in general be cleaned

from weeds, and kept in vigorous growth, by proper implements and horse labor. The ground between the rows is mostly wrought by a proper horse-hoe, cultivator, or small hoe-plough, taking care that none of the mould is thrown against the rows; to prevent which, the intervals may be hoed with a triangular harrow, having a proper number of iron tines in it, and guided by two handles fixed behind. By these handles the tines are made to go deeper or shallower at pleasure; and if the intervals are cultivated with this instrument, beginning before the earth is become stale, and while the weeds are small, the land may be kept very clean, and in fine tilth, at much less expense than hand-hoeing: for one horse is sufficient for this work. A great deal may be done in a day; and by a frequent repetition of the hoeing, especially when the earth is dry, the weeds may be so effectually kept down as never to rise to any height. But the rows must be weeded by hand. With some it has been a custom to sow, with their linseed, either annual or perennial grass-seeds, when they intend to lay the land down for pasture after the crop is taken off. But as grass plants grow but weakly under the flax, it is a practice by no means to be recommended. No other sort of crop should, however, be ever grown with this, as much injury may be done by it. Flax is sometimes damaged by insects, when it it about three or four inches high. These, it is said, may be destroyed by a slight strewing of soot, ashes, &c., over the crop. At all events, this dressing will give vigor to the flax though it may not kill the insects. If any weeds appear afterwards among the flax, as is almost always the case, they must be thoroughly rooted out: and, that the flax may be as little damaged as possible in the doing of this, the weeders should work as carefully as possible. The finest flax is most liable to be laid, particularly in countries subject to storms. To guard against this accident, some people run across their flax-fields slender poles fixed to stakes: but a better method is to run small ropes across the field, both lengthwise and breadthwise, where necessary; for these being fastened where they intersect one another, and supported by stakes at due distances, form a kind of network, which is proof against almost every accident that can happen from tempestuous weather. These practices are, however, both troublesome and expensive, and are seldom or ever necessary where the crops have not been sown too thick on the ground.

When the crop grows so short and branchy, as to appear more valuable for seed than flax, it ought not to be pulled before it be thoroughly ripe; but if it grows long and not branchy, the seed should be disregarded, and all the attention given to the flax. In the last case it ought to be pulled after the bloom has fallen, when the stalk begins to turn yellow, and before the leaves fall, and the bolls turn hard and sharp-pointed. When the stalk is small, and carries few bolls, the flax is fine; but the stalk of coarse flax is gross, rank, branchy, and carries many bolls. When the flax has fallen, and lies, such as lies ought to be immediately pulled, whether it has grown enough or not, as otherwise it will grow unequally, so that some parts are ready for pulling before other parts; only what is ready should be pulled, and the rest should be suffered to stand till ready. The flax-raiser ought to be at pains to pull, and keep by itself, each different kind of lint which he finds in his field; what is both long and fine, by itself; what is both long and coarse, by itself; what is both short and fine, by itself; what is both short and coarse, by itself; and in like manner every other kind by itself that is of the same size and quality. If the different kinds be not thus kept separate, the flax must be much damaged in the watering and the other succeeding operations. What is commonly called under-growth may be neglected as useless. Few persons that have seen pulled flax, are ignorant of the method of laying it in handfuls across each other; which gives the flax sufficient air, and keeps the handfuls separate and ready for the rippler.

Donaldson observes, that a crop of flax frequently grows short, and runs out a great number of seed-bearing branches. When this is the case, the seeds, not the flax, ought to be the farmer's chief object, and the crop should be allowed to stand till the seeds are in a great measure perfected. But that when the crop thrives, and is likely to become more valuable for the flax than the seeds, it should be pulled soon after the bloom drops off, and before the pods turn hard and sharp in the points. When flax is grown for its fibre, Brown considers it the safest course to take it a little early, any thing wanting in quantity, being, in this way, made up by the superiority of quality.

After pulling, if the flax is to be regarded more than the seed, it should lie some hours upon the ground to dry a little, and so gain some firmness, to prevent the skin or harle, which is the flax, from rubbing off in the rippling; an operation which ought by no means to be neglected, as the bolls, if put into the water along with the flax, breed vermin there, and otherwise spoil the water. The bolls also prove very inconvenient in the grassing and breaking. In Lincolnshire and Ireland, they think that rippling hurts the flax; and, therefore, in place of rippling, they strike the bolls against a stone. The handfuls for rippling should not be great, as that endangers the lint in the rippling comb. After rippling, the flax-raiser will perceive that he is able to assort each size and quality of the flax by itself more exactly than he could before.

If the flax be more valuable than the seed, it ought by no means to be *stacked* during winter; for its own natural juice assists it greatly in the watering; whereas, if kept long unwatered, it loses that juice and the harle adheres so much to the boon, that it requires longer time to water, and even the quality of the flax becomes thereby harsher and coarser. Besides, the flax stacked up over year, is in great danger from vermin and other accidents; the water in spring is not so soft and warm as in harvest; and nearly a year is thereby lost of the use of the lint: but if the flax be so short and branchy as to appear most valuable for seed, it ought, after pulling, to be stooked and dried upon the field, as is done with corn; then stacked up for winter, rippled in

spring; and, after sheeling, the seed should be well cleaned from all bad seeds, &c.

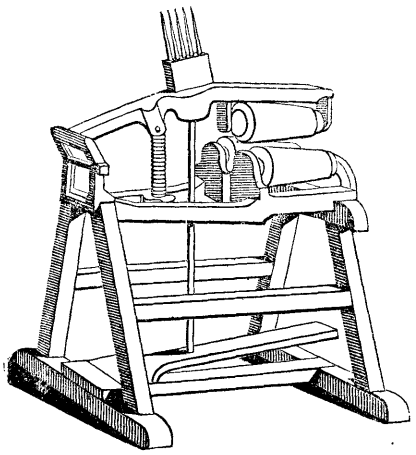
With regard to *watering* flax, a running stream wastes the lint, makes it white, and frequently carries it away. Both rivers and lochs water the flax quicker than canals. But all flax ought to be watered in canals, say our northern neighbours, which should be digged in clay ground if possible, as that soil retains the water best; but if a firm retentive soil cannot be got, the bottom or sides of the canal, or both the bottom and sides, may be lined with clay; or instead of lining the sides with clay, which might fall down, a ditch may be dug without the canal, and filled with clay, which will prevent both extraneous water from entering, and the water within from running off. A canal of forty feet long, six broad, and four deep, will generally water the growth of an acre of flax. It ought to be filled with fresh soft water from a river or brook, if possible, two or three weeks before the flax is put in, and exposed all that time to the heat of the sun. The greater way the river or brook has run, the softer, and therefore the better, will the water be. Springs, or short runs from hills, are too cold, unless the water is allowed to stand long in the canal. Water from coal or iron is very bad for flax. A little of the powder of galls, thrown into a glass of water, will immediately discover if it comes from minerals of that kind, by turning it into a dark color, more or less tinged in proportion to the quantity of vitriol it contains. The canal ought not to be under shade; which, besides keeping the sun from softening the water, might make part of the canal cooler than other parts, and so water the flax unequally. The flax-raiser will observe, when the water is brought to a proper heat, that small plants will be rising quickly in it, numbers of small insects and reptiles will be generating there, and bubbles of air rising on the surface. If no such signs appear, the water must not be warm enough, or is otherwise unfit for flax. Moss holes, when neither too deep, nor too shallow, frequently answer well for watering flax, when the water is proper, as before described. The proper season for watering flax is from the end of July to the end of August. The advantage of watering flax as soon as possible after pulling has been already mentioned. The flax being sorted after rippling, as before mentioned, should next be put in beets, never larger than a man can grasp with both his hands, and tied very slack with a band of a few stalks. Dried rushes answer exceedingly well for binding flax, as they do not rot in the water, and may be dried and kept for use again. The beets should be put into the canal slope-ways, or half standing upon end, the root end uppermost. Upon the crop ends, when uppermost, there frequently breed a deal of vermin, destructive of the flax, which is effectually prevented by putting the crop end downwards. The whole flax in the canal ought carefully to be covered from the sun with divots; the grassy side of which should be next the flax, to keep it clean. If it is not thus covered, the sun will discolor the flax, though quite covered with water. If the divots are not weighty enough to keep the flax entirely under water, a few stones may be laid above them. But the flax should not be pressed to the bottom. When the flax is sufficiently watered, it feels soft to the gripe, and the harle parts easily with the boon or show, which last is then become brittle, and looks whitish. When these signs are found, the flax should be taken out of the water, beet after beet; each gently rinsed in the water, to cleanse it of the nastiness which has gathered about it in the canal; and, as the lint is then very tender, and the beet slackly tied, it must be carefully and gently handled. Great care ought to be taken that no part be overdone; and as the coarsest waters soonest, if different kinds be mixed together, a part will be rotted, when the rest is not sufficiently watered. When lint taken out of the canal is not found sufficiently watered, it may be laid in a heap for twelve, eighteen, or twenty-four hours, which will have an effect like more watering; but this operation is nice, and may prove dangerous in unskilful hands. After the flax is taken out of the canal, fresh lint should not be put a second time into it, until the former water be run off, and the canal cleaned and supplied with fresh water. Short heath is the best field for grassing flax; as, when wet, it fastens to the heath, and is thereby prevented from being blown away by the wind. The heath also keeps it a little above the earth, and so exposes it the more equally to the weather. When such heath is not to be got, links or clean old lea ground is the next best. Long grass grounds should be avoided, as the grass growing through the lint frequently spots, tenders, or rots it; and grounds exposed to violent winds should also be avoided. The flax, when taken out of the water, must be spread very thin upon the ground; and, being then very tender, it must be gently handled. The thinner it is spread the better, as it is then the more equally exposed to the weather. But it ought never to be spread during a heavy shower, as that would wash and waste the harle too much, which is then excessively tender, but soon after becomes firm enough to bear the rain, which, with the open air and sunshine, cleans, softens, and purifies the harle to the degree wanted, and makes it blister from the boon. In short, after the flax has got a little firmness by being a few hours spread in dry weather, the more rain and sunshine it gets the better. If there be little danger of high winds carrying off the flax, it will be much the better for being turned about once a-week. If it is not to be turned, it ought to be very thinly spread. The spreading of flax and hemp requires a deal of ground, and enriches it greatly. The skilful flax-raiser spreads his first row of flax at the end of the field opposite to the point whence the most violent wind commonly comes, placing the root ends foremost; he makes the root ends of every other row over-lap the crop ends of the former row three or four inches, and binds down the last row with a rope; by which means the wind does not easily get below the lint to blow it away: and, as the crop ends are seldom so fully watered as the root ends, the aforesaid over-lapping has an effect like giving the crop ends more watering. Experience only can fully teach a person the signs of flax being sufficiently grassed:

then it is of a clearer color than formerly; the harle is blistered up, and easily parts with the boon, which is then become very brittle. The whole should be sufficiently grassed before any of it is lifted; for, if a part be lifted sooner than the rest, that which remains is in great danger from the winds. A dry day ought to be chosen for taking up the flax; and, if there is no appearance of high wind, it should be loosed from the heath or grass, and left loose for some hours, to make it thoroughly dry. As a great quantity of flax can scarcely be all equally watered and grassed, and as the different qualities will best appear at lifting the flax off the grass, therefore at that time each different kind should be gathered together, and kept by itself; that is, all of the same color, length, and quality. The smaller the beets lint is made up in, the better for drying, and the more convenient for stacking, housing, &c., and in making up these beets, as in every other operation upon flax, it is of great consequence that the lint be laid together as it grew, the root ends together, and the crop ends together.

In the Gentleman's Magazine for June, 1787, a method of watering flax is proposed whereby the labor would be shortened; the strength of the flax probably increased; the color rendered much finer; the operation of bleaching rendered safer and less tedious; a very disagreeable nuisance suppressed; the linen manufacture much improved; and the national income increased many thousand pounds a-year. The ingenious author, after pointing out the many inconveniences of the present method of soaking the flax in rivulets, ponds, and stagnant pools, such as the offensive smell and inky tinge arising from it in ponds, the pernicious effects of the noxious infusion, by destroying the fish in rivulets, the hurt done to cattle by preventing them from drinking the water, however thirsty, the danger of bad consequences even to the health of men, from the disagreeable effluvia, &c., proposes to improve as well as shorten the process, by plunging the new flax, after it is rippled, into scalding water, which, in extracting the vegetative sap, would do, in five minutes, more than cold water would do in a fortnight, or perhaps at all. This he illustrates analogically, by the familiar examples of infusing tea, and blanching rough almonds, in scalding water and not in cold water. Boiling water, he thinks, would also clear the new flax from many impurities, which, when not removed till it be spun into yarn, are then removed with difficulty, and loss of substance. Upon the new system, the act of bleaching would begin immediately after rippling; and a little done then might save much of what is generally done after spinning and weaving. To spin dirty flax, with a view of cleaning it afterwards, appears to be the same impropriety as if we were to reserve part of the dressing given to leather till after it is made into a glove. Should the plunging of the flax into the boiling water not suffice to make the boon brittle enough, then the common watering might be added; but in that case probably half the time usually given to this watering would suffice, and the flax might then be laid in clear rivulets, without any apprehension of its infecting the water and poisoning the fish, or of being discolored itself; for the boiling water, into which it had been previously put, would have extracted all the poisonous vegetative sap, which I presume is what chiefly discolors the flax, or kills the fish. On the supposition that the use of boiling water in the preparation of flax may be advantageous, I can recollect at present but one objection against its being generally adopted. Every flax-grower, it may be said, could not be expected to have conveniences for boiling water sufficient for the purpose; the consumption of water would be great; and some additional expense would be incurred. In answer to this, I presume any additional expense would be more than reimbursed by the better marketable price of the flax. In a large cauldron a great deal of flax might be dipt in the same water, and the consumption perhaps would not be more than a quart to each sheaf. Even a large household pot would be capable of containing one sheaf after another; and the whole objection would be obviated were the practice to prevail with us, as in Flanders and Holland, that the flax-grower and the flax-dresser should be two distinct professions. He concludes with recommending to those who are inclined to make experiments, not to be discouraged by the failure of one or two trials. Perhaps the flax, instead of being just plunged into the scalding water, ought to be kept in it five minutes, perhaps a quarter of an hour, perhaps a whole hour. Such boiling, when in this state, might in return save several hours boiling in the article of bleaching. It is not probable that the boiling of the flax with the boon in it would prejudice the harle; for, in the course of its future existence, it is made to be exposed twenty or forty times to this boiling trial; and, if not detrimental in the one case, it is to be presumed it would not be detrimental in the other. Perhaps, after the boiling, it would be proper to pile up the flax in one heap for a whole day, or half a day, to occasion some fermentation: or immediately after the boiling it might be proper to wash it with cold water. The great object, when the flax is pulled, is to get the harle from the boon with as little loss and damage as possible; and if this is accomplished in a more complete manner than usual, considerable labor and expense will be saved in the future manufacturing of the flax. On this account much more would be gained than lost, were the two or three last inches of the roots of the stems to be clipt off, previously to the flax being either watered or boiled. When the flax is watered, care should be taken not to spread it out dry, when there is a hazard of its being exposed in its wet state to frost. This method appears extremely plausible, and certainly merits a fair trial.

Hill and Bundy's machine for breaking flax and hemp, is the latest improvement of this kind. It seems to have been suggested by Mr. Lee as far back as 1810. It is portable, and may be worked in barns or out-houses of any kind; a great part of the work is so light that it may be done by children and infirm persons; and such is the construction and simplicity of the machine, that no previous instruction or practice is required. The woody part is re

moved by a very simple machine; and, by passin gthrough a second machine equally simple, the flax may be brought to any degree of fineness, equal to the best used for lace or cambric in France and the Netherlands. The original length of the fibre, as well as its strength, remains unimpaired; and the difference of the produce is



immense, being nearly two-thirds; one ton of flax being produced from four tons of stem. The expense of working each ton obtained by this method is only five pounds. The glutinous matter may be removed by soap and water only, which will bring the flax to such perfect whiteness, that no further bleaching is necessary, even after the linen is woven; and the whole process of preparing flax may be completed in six days.

The produce of flax in seed is generally, says Mr. Loudon, from six to eight sometimes, as high as ten or twelve, bushels per acre; and the price depends, in a great measure, on that of foreign seed imported; as, when sold to oil-makers, it is generally about one-half of that of Dutch seed sold for the purpose of sowing. The price of home-cultivated linseed is considerably advanced of late in some of the southern and western counties of the kingdom, in proportion to what it is in those of the northern, owing to the circumstance of its being much used as food for fattening cattle. The average price of the linseed cultivated in the kingdom at large, cannot, it is supposed, be rated higher than from three to four shillings the bushel.

FLAX, CAROLINA. See POLYPREMUM.

FLAX, EARTH. See AMIANTHUS.

FLAX PLANT, NEW ZEALAND. See PHORMIUM.

FLAX, TOAD. See ANTIRRHINUM.

FLAX-DRESSING. For many ages it was the practice to separate the boon or core from the flax, which is the bark of the plant, by hand methods. First, for breaking the boon, the stalks in smal. parcels were beaten with a mallet; or, more dexterously, the break was used thus: The flax being held in the left hand across three under teeth, or swords of the break, the upper teeth were with the right hand quickly and often forced down upon the flax, which was artfully shifted and turned with the left hand. Next, for clearing the flax of the broken boon, the workman with his left hand held the flax over the stock, while with his right hand he struck or threshed the flax with the scutcher. These methods of breaking and scutching the flax being slow, and very laborious, a water-mill was invented in Scotland about the year 1750; which, with some late improvements, makes great despatch, and in skilful and careful hands gives satisfaction. It has been generally constructed to break the boon by three dented rollers, placed one above the other. The middle one, being forced quickly round, takes the other two along with it; and one end of the handfuls of the flax being by the workmen directed in between the upper and middle rollers, the flax is immediately drawn in by the rollers; a curved plate of tin behind the rollers directs the flax to return again between the middle and undermost rollers; —and thus the operation is repeated until the boon be sufficiently broken. Great weights of timber or stone, at the end of levers, press the upper and under rollers towards the middle one. The scutching is next carried on by the mill in the following manner:—Four arms, something like the hand-scutchers, project from a perpendicular axle; a box around the axle encloses these projecting scutchers; and this box is divided among the workmen, each having sufficient room to stand and handle his flax, which, through slits in the upper part and sides of the box, they hold in to the stroke of the scutchers; which, moving round horizontally, strike the flax across or at right angles, and so thresh out or clear it of the boon. The breaking of the flax by rollers is scarcely subject to any objection, but that it is dangerous to workmen not sufficiently on their guard, who sometimes allow the rollers to take hold of their fingers, and thereby their whole arm is instantly drawn in: thus many have lost their arms. To avoid this danger, a break, upon the principle of the hand break, has been lately adapted to water machinery, and used in place of rollers. The horizontal stroke of the scutchers was long thought too severe, and wasteful of the flax; but very careful experiments have discovered that the waste complained of must be charged to the unskilfulness or negligence of the workmen, as in good hands the mill carries away nothing but what, if not scutched off, must be taken off in the heckling with more loss both of time and flax. But to obviate this objection of the violence of the horizontal scutchers, an imitation of hand scutching has lately been applied to water. The scutchers then project from an horizontal axle, and move like the arms of a check-reel, striking the flax neither across nor perpendicularly down, but sloping in upon the parcel exactly as the flax is struck by the hand-scutcher. This sloping stroke is got by raising the scutching-stock some inches higher than the centre of the axle; and by raising or lowering the stock, over which the flax is held, or screwing it nearer to or farther from the scutchers, the workman can temper or humor the stroke almost as he pleases. A lint mill, with horizontal scutchers upon a perpendicular axle, requires a house of two stories. the

rollers or break being placed in the ground story, and the scutchers in the loft above; but a mill with vertical scutchers on an horizontal axle, requires but one ground story for all the machinery. Another method of breaking or scutching flax, more expeditious than the old hand methods, and more gentle than water mills, has also been lately invented in Scotland. It is much like the break and scutcher giving the sloping stroke last described, moving by the foot. The treadle is remarkably long, and the scutchers are fixed upon the rim of a fly-wheel. The foot break is also assisted in its motion by a fly. These foot machines are very useful where there are no water-mills, but they are far inferior to the mills in point of expedition.

The next operation that flax undergoes is heckling. The heckle is firmly fixed to a bench before the workman, who strikes the flax upon the teeth of the heckle, and draws it through the teeth. To persons unacquainted with that kind of work this may seem a very simple operation; but, in fact, it requires as much practice to acquire the sleight of heckling well, and without wasting the flax, as any other operation in the whole manufacture of linen. They use coarser and wider-teethed heckles, or finer, according to the quality of the flax; generally putting the flax through two heckles, a coarser one first, and next a finer one. See HECKLING.

Flax for cambric and fine lawn, thread, and lace, is dressed in a manner somewhat different. It is not scutched so thoroughly as common flax; which from the scutch proceeds to the heckle, and from that to the spinner: whereas, this fine flax, after a rough scutching, is scraped and cleansed with a blunt knife upon the workman's knee covered with his leather apron; from the knife it proceeds to the spinner, who, with a brush made for the purpose, straightens and dresses each parcel just before she begins to spin it.