

Bur-knot.

A Bur-knot kindly taken from an Apple-tree, is much better and surer. You must cut him close at the Root end, an handfull under the knot, (some use in Summer about Lammes to circumsise him and put earth to the knots with hay-Ropes, and in winter cut him off and set him but this is curiosity needlesse, and danger with removing and drought) and cut away all his twigs save one, the most principall, which in setting you must leave above the earth, burying his trunk in the crust of the earth for his Root. It matters not much what part of the bough the twigs grow out of. If it grow out of, or near the Root end, some say such an apple will have no core nor kernel. Or if it please the planter he may let his bough be crooked, and leave out his top end one foot, or somewhat more, wherein will be good grafting; if either you like not, or doubt the fruit of the bough, (for commonly your bur-knots are Summer fruit) or if you think he will not Recover his wound safely.

Usuall sets.

The most usuall kind of Sets, are plants with Roots growing, of kernels of Apples, Pears, and Crabbs, or stones of Cherries, Plums, &c. removed out of a nursery, wood, or other Orchard, into, and set, in your Orchard in due places; I grant this kind to be better than either of the other by much, as more sure and more durable. Herein you must note, that in Sets so removed, you cut all the Roots you can, and without bruising of any, I utterly dislike the opinion of those great Gardners, that following their books, would have the maine Roots cut away: for tops cannot grow without Roots. And because none can get all the Roots and removal is an hinderance, you may not leave on all tops, when you set them: For there is a proportion betwixt the Top and Root of a Tree, even in the number, (at least in the growth) If the Roots be many, they will bring you many Tops, if they be not hindered. And if you use to stow or top your tree too much or too low, and leave no issue, or little for sap, (as is to be seen in your hedges) it will hinder the growth of Roots and boal, because such a kind of stowing is a kind of smothering or choaking the sap. Great Wood, as Oak, Elm, Ash, &c. being continually kept down with sheer knife, ax, &c. neither boal nor Root will thrive, but as an hedge or bush. If you intend to graff. in your sets, you may cut him closer with a greater wound, and neerer the earth with

Maine Roots cut.

Stow sets removen.

within a foot or two, because the graft or grafts will cover his wound. If you like his fruit, and would have him to be a Tree of himselfe, be not so bold. This I can tell you, that though you do cut his top close, and leave nothing but his bulke, because his roots are few, if he be (but little) bigger than your thumb, (as I wish all plants removed to be) he will safely recover his wound within seven years, by good guidance, that is, if the next time of dressing, immediately above his uppermost sprig, you cut him off aslope cleanly, so that the sprig stand on the back side, (and if you can Northward, that the wound may have the benefit of the Sun) at the upper end of the wound, and let that sprig onely be the boal. And take this for a generall rule; Every young General rule. plant, if he thrive, will recover any wound above the earth, by good dressing, although it be to the one halfe, and to his very heart. This short cutting at the remove, saves your plants from wind, and needs the lesse or no staking: I commend not lying or Tying of trees. leaning of Trees against holds or stays; for it breeds obstruction of sap, and wounds incurable. All removing of Trees as great as General rule. your arm, or above, is dangerous; though some time such will grow, but not continue long, because they be tainted with deadly wounds, either in the Root or top, (and a Tree once thorowly tainted, is never good.) And though they get some hold in the Signs of dis- earth with some lesser saw or taws, which give some nourish- cates, chap. 13. ment to the body of the Tree; yet the heart being tainted, he will hardly ever thrive: which you may easily discern by the blackness of the boughs at the heart, when you dresse your trees. Also, when he is set with more tops than the Roots can nourish; the tops decaying, blacken the boughs, and the boughs the arms, and so they boil at the very heart. Or this taint in the removall, if it kill not presently, but after some short time, it may be discerned, black or yellowness in the bark, and a small hungred leaf. Or if your removed plant put forth leaves the next and second Summer and little or few sprases, is a great sign of a taint, and next years death. I have known a Tree tainted in setting, yet grow, and bear blossoms for divers years; and yet for want of strength could never shape his fruit.

Next unto this, or rather equall with these plants, are suck- Suckers good- ers growing out of the Roots of great Trees, which Cherries and fers. Plums

Plums do seldome or never want, and being taken kindly with their Roots, will make very good sets. And you may help them much by enlarging their Roots with the taws of the tree, whence you take them. They are of two sorts: Either growing from the very Root of the Tree: and here you must be carefull, not to hurt your Tree when you gather them, by Ripping amongst the Roots, and that you take them clean away; for these are a great and continual annoyance to the growth of your Tree; and they will hardly be cleansed. Secondly; or they do arise from some taw: and these may be taken without danger, with long and good Roots, and will soon become Trees of strength.

A Running
plant.

There is another way, which I have not thorowly proved, to get not onely plants for grafting, but Sets to remain for Trees, which I call a *Running plant*, the manner of it is this: Take a Root or kernal, and put into the middle of your plot; and the second year in the spring, geld his top, if he have one principal, (as commonly by nature they have) and let him put forth only four Syons toward the four corners of the Orchard, as neer the earth as you can. If he put not four (which is rare) stay his top till he have put so many. When you have four such, cut the stock aslope, as is aforesaid in this Chapter, hard above the uppermost sprig, and keep those four without Syons clean and streight till you have them a yard and a half, at least, or two yards long. Then the next spring, in grafting time, lay down those four sprays, towards the four corners of your Orchard, with their tops in a heap of pure and good earth, and raised as high as the Root of your Syon, (for sap will not descend) and a sod to keep them down, leaving nine or twelve inches of the top to look upward. In that hill he will put Roots, and his top new Cyons, which you must spread as before, and so from hill to hill, till he spread the compasse of your ground, or as far as you List. If in bending the Syons crack, the matter is small; cleanse the ground, and he will recover. Every bended bough will put forth branches, and become Trees. If this plant be of a bur knot, there is no doubt: I have proved it in one branch my selfe, and I know at *Wilton in Cleveland*, a Pear-Tree of a great bulk and age, blown close to the earth, hath put at every knot Roots into the earth, and from Root to top, a great number of mighty arms or Trees, filling a great Room, like many Trees, or

a little Orchard; much better may it be done by Art, in a Jesse Tree. And I could not mislike this kind, save that time will be long before it come to perfection.

Many use to buy sets already grafted, which is not the best way: Sets bought for first, all removes are dangerous: Again, there is danger in the carriage: Thirdly, it is a costly course of planting: Fourthly, every Gardner is not trusty to sell you good fruit: Fifthly, you know not which is best, which is worst, and so may take most care about your worst Trees. Lastly, this way keeps you from practise, and so from experience, in so Good, Gentlemanly, Scholar-like, and profitable a faculty.

The onely best way (in my opinion) to have sure and lasting sets, is never to remove: for every remove is a hinderance, if not a dangerous hurt, or deadly taint. This is the way: The plot being laid, and the plot appointed where you will plant every Set in your Orchard, dig the room where your set shall stand, a yard compasse, and make the earth mellow and clean, and mingle it with a few coleshes, to avoid worms, and immediately after the first change of the Moon, in the latter end of *February*, the earth being atreth turned over, put in every such room three or four kernal of Apples or Pears of the best; every kernal in an hole made with your finger, finger-deep, a foot distant one from another, and that day month following, as many more, (least some of the former miss:) in the same compasse, but not in the same holes. Hence (God willing) shall you have roots enough: If they all or divers of them come up, you may draw, (but not dig) up (nor put down) at your pleasure, the next *November*. How many soever you take away, to give or bestow elsewhere, be sure to leave two of the proudest. And when in your second or third year you graft, if you graft then at all, leave the one of those two ungrafted, lest in grafting the other, you fail. For I find by tryall, that after the first or second grafting in the same stock, being mist (for who hits all) the third messe puts your stock in deadly danger, for want of issue of sap. Yea, though you hit in grafting, yet may your grafts with wind or otherwise be broken down. If your graft or graft prosper, you have your desire, in a plant unremoved, without taint, and the fruit at your owne choice: and so you may, (some little earth being removed) pull but not dig up

up the other plant or plants in that room. If your graft or stock, or both perish, you have another in the same place, of better strength to work upon, for thriving without snub, he will overlay your grafted stock much. And it is hardly possible to misse in grafting so often, if your Gardiner be worth his name.

Sets ungrafted
best of all.

It shall not be amiss, (as I judge it) if your kernels be of choice fruit, and that you see them come forward proudly in their body, and beare a fair and broad leaf in colour, tending to a greenish yellow. (which argues pleasant and great fruit) to try some of them ungrafted: for although it be a long time ere this come to bear fruit, ten or twelve years, or more; and at their first bearing, the fruit will not seem to be like his owne kind, yet am I assured, upon Tryall, before twenty years growth, such Trees will increase the bignesse and goodnesse of their fruit, and come perfectly to their owne kind. Trees (like other breeding creatures) as they grow in years, bignesse, and strength, so they mend their fruit. Husbands and Housewives find this true by experience, in the Rearing of their young store. More than this, there is no Tree like this for soundnesse, and durable last, if his keeping and dressing be answerable. I grant, the readiest way to come soon to fruit, is grafting; because, in a manner, all your grafts are taken off fruit-bearing Trees.

Time of removing.

Now when you have made choise of your sets to remove, the ground being ready, the best time is, immediately after the fall of the Leaf, in or about the change of the Moon, when the sap is most quiet, for then the sap is turning: for it makes no stay, but in the extremity of drought or cold: At any time in winter, may you transplant Trees, so you put no ice nor snow to the Root of your plant in the setting: and therefore open, calm, and moyst weather is best. To remove, the Leaf being ready to fall, and not fallen, or buds apparently put forth in a moist warm season, for need, sometime may do well; but the safest is to walk in the plain trodden path.

Generall rule.

Some hold Opinion, that it is best removing before the fall of the Leaf, and I hear it is commonly practised in the South by our best Arborists, the leaf not fallen, & they give the reason to be, that the descending of the sap will make speedy Root. But mark the Reasons following, and I think you shall find no soundnesse either

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in that position or practice, at least in the reason.

1. I say, it is dangerous to remove when the sap is not quiet; for every remove gives a main check to the stirring sap, by staying the course thereof in the body of your plant, as may appear by trees removed any time in Summer, they commonly dye, nay hardly shall you save the life of the most young and tender plant of any kind of wood (scarcely hearbs) if you remove them in the pride of sap: for proud sap universally stayed by removall, ever hinders, often taints, and so presently, or in very short time, kills. Sap is like blood in mans body, in which is the life, Chap. 3. page 9. If the blood universally be cold, life is excluded: so is sap tainted by untimely removall. A stay by drought, or cold, is not so dangerous (though dangerous, if it be extream) because more natural.

2. The sap never descends, as men suppose; but is consolidated and transubstantiated into the substance of the tree, and passeth (alwaies above the earth) upward, not only betwixt the bark and the wood, but also into and in both body and bark, though not so plentifully, as may appear by a tree budding, nay fructifying two or three yeers, after he be circumcised, at the very root, like a River that enlargeth his channel by a continual descent.

3. I cannot perceive what time they would have the sap to descend. At *Midsummer* in a biting drought it stays, but descends not; for immediately upon moisture, it makes second shoots, as (or before rather) *Michaelide*, when it shapens his buds for next yeers fruit. If at the fall of the leaf, I grant, about that time is the greatest stand, but no descent of sap, which begins somewhat before the leaf fall, but not long; therefore at that time must be the best removing, not by reason of descent, but stay of sap.

4. The sap in this course hath its profitable and apparent effects; as the growth of the tree, covering of wounds, putting of buds, &c. Whereupon it followes, if the sap descend, it must needs have some effect to shew it.

5. Lastly, boughs plasht and laid lower than the root, dye for want of sap descending, except where it is forced by the maine stream of the sap, as in top boughs hanging like water in pipes, or except the plasht boughs lying on the ground put roots of his own; yea under boughs, which we commonly call water-boughs

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can scarcely get sap to live, yea in time dye, because the sap doth presse so violently upward, and therefore the fairest shoots and fruits are alwaies in the top.

Remove soon.

Obett. If you say that many so removed thrive; I say, that somewhat before the fall of the leaf (but not much) is the stand; for the fall and the stand are not at one instant; before the stand, is dangerous. But to return.

The sooner in Winter you remove your sets the better; the latter the worse; for it is very perillous if a strong draught take your sets before they have made good their Rooting. A plant set at the fall, shall gain (in a manner) a whole years growth of that which is set in the Spring after.

The manner of setting.

I use in the setting to be sure that the earth be mouldy, (and somewhat moist) that it may run among the small tangles without straining or bruising; and as I fill in earth to his Root, I shake the Set easily too and fro, to make the earth settle the better to his Roots; and with all easily with my foot I put in the earth close; for Aire is noysome, and concavities will follow. Some prescribe Oates to be put in with the earth: I could like it, if I could know any Reason thereof. And they use to set their plants with the same side towards the Sun; but this concert is like the other. For first, I would have every tree to stand so free from shade, that not onely the Root (which therefore you must keep bare from grasse) but body, boughs, and branches, and every spray, may have the benefit of the Sun. And what hurt, if that part of the tree which before was shadowed, be now made partakers of the heat of the Sun? In turning of Bees, I know it is hurtfull, because it changeth their entrance, passage, and whole work, but not so in trees.

Set in the crust.

Moisture good

Set as deep as you can, so that in any wise you go not beneath the crust. Look Chap 2.

We spake in the second Chapter of moisture in generall; but now especially having put your removed plant into the earth, powr on water (of a puddle were good) by distilling presently, and so every week twice, in strong drought, so long as the earth will drink, and refuse by overflowing. For moisture mollifies, and both gives leave to the Roots to spread, and makes the earth yeld sap and nourishment with plenty and facility.

they

(they say) give best and most milk after warm drinks.

If your ground be such, that it will keep no moysture at the Root of your plant, such plants shall never like, or but for a time. There is nothing more hurtfull for young trees, then peircing drought. I have known trees of good stature, after they have been of divers years growth, and thrive well for a good time, perish for want of water, and very many by reason of taints in setting.

It is meete your sets and grafts be fenced, till they be as big as your arm, for fear of annoyances. Many wayes may Sets receive damages, after they be set, whether grafted or ungrafted. For although we suppose, that no noysome beast or other thing must have accessse among your trees; yet by casualty, a Dog, Cat, or such like, or your self, or negligent Friend bearing you Company, or a shrewd boy, may tread or fall upon a young and tender plant or graft. To avoid these and many such chances, you must stake them round a pretty distance from the Set, neither so neer nor so thick, but that it may have the benefit of the Sun, Raine, and Air. Your stakes (small or great) would be so surely put, or driven into the earth, that they break not, if any thing happen to lean upon them, else may the fall be more hurtfull then the want of the fence. Let not your stakes shelter any weeds about your Sets; for want of Sun is a great hinderance. Let them stand so far off, that your grafts spreading receive no hurt, either by rubbing on them, or of any other thing passing by. If your stock be long, and high grafted, (which I must discommend, except in need) because there the sap is weak, and they are subject to strong winds, and the lightings of birds,) tie easily with a soft list three or foure pricks, under the clay, and let their tops stand above the grafts to avoid the lighting of Crows, Pies, &c. upon your grafts. If you stick some sharp thorns at the Roots of your stalks, they will make hurtfull things keep off the better. Other better fences for your grafts I know none. And thus much for sets and setting.

Grafts must be fenced.

CHAP. VIII.

Of the distance of Trees.

I Know not to what end you should provide good ground, well fenced, and plant good sets, and when your trees should come

to profit, have all your labours lost, for want of due regard to the distance of placing your trees. I have seen many trees stand so thick, that one could not thrive for the throng of his neighbours. If you do mark it, you shall see the tops of trees rubbed off, their sides galled like a gall'd horse back; and many trees have more stumps than boughs, and most trees not well thriving, but short stumpish, and evill thriving boughs; like a Corn-field over-seeded, or a Town over peopled, or a pasture over laid; which the Gardner must either let grow, or leave the tree very few boughs to bear fruit. Hence small thrift, galls, wounds, diseases, and short life to the trees; and while they live, green, little, hard, worm-eaten, and evill thriving fruit arise, to the discomfort of the owners.

To prevent which discomfort, one of the best remedies is, the sufficient and fit distance of trees. Therefore at the setting of your plants, you must have such respect, that the distance of them be such, that every tree be not annoyance, but an help to his fellows; for trees (as all other things of the same kind) should shroud, and not hurt one another. And assure your self, that every touch of trees (as well under as above) is hurtfull: Therefore this must be a general use rule in this Art, that no tree in an Orchard well ordered, or no bough, nor cyon, drop upon or touch his fellows. Let no man think this impossible, but looke in the eleventh Chapter of dressing of trees. If they touch, the wind will cause a forcible rub. Young twigs are tender, if boughs or armes touch or rub, if they are strong, they make great galls. No kind of touch therefore in trees can be good.

Now it is to be considered what distance among Sets is requisite, and that must be gathered from the compasse and room that each tree by probability will take and fill. And herein I am of a contrary opinion to all them which practise or teach the planting of trees, that ever yet I knew, read or heard of: for the common space between tree and tree, is ten foot; if twenty foot, it is thought very much. But I suppose twenty yards distance is small enough betwixt tree and tree, or rather too too little. For the distance must needs be as far as two trees are well able to overspread and fill, so they touch not by one yard at the least. Now I am assured, and I know one Apple tree, set of a slip *finger great*, in

Hurts of too
neer planting

General rule,
All touches
hurtfull.

The best dis-
tance of trees.

in the space of twenty yeares (which I account a very small part of a trees age, as is shewed Chap. fourteen) hath spread his boughs eleven or twelve yards compasse; that is, five or sixe yards on every side. Hence I gather, that in forty or fifty yeares, (which yet is but a small time of his age) a tree in good soyle, well liking, by good dressing (for that is much available to this purpose) will spread double at the least, viz. twelve yards on a side; which being added to twelve allotted to his fellow make twenty and foure yards, and so far distant must every tree stand from another. And look how far a tree spreads his boughs above, so far doth he put his roots under the earth, or rather further, if there be no stop nor let by walls, trees, rocks, barren earth, and such like: for an huge bulk, and strong armes, massie boughs, many branches, and infinite twigs, require wide spreading Roots. The top hath the vast aire to spread his boughs in, high and low, this way and that way; but the Roots are kept in the crust of the earth, they may not goe downward, nor upward out of the earth, which is their Element, no more than the Fish out of the water, Camelion out of the aire, nor Salamander out of the fire. Therefore they must needs spread far under the earth. And I dare well say, If nature would give leave to man, by Art to dresse the Roots of Trees, to take away the taws, and tangles that lap and fret, and grow superfluously and disorderly, (for every thing *sublunary* is cursed for mans sake) the tops above being answerably dressed, we should have trees of wonderfull greatnesse, and infinite durance. And I perswade my self that this might be done sometimes in Winter, to trees standing in fair plaines and kindly earth, with small or no danger at all. So that I conclude, that twenty four yards is the least space that Art can allow for trees to stand distant one from another.

If you aske me what use shall be made of that waste ground betwixt tree and tree: I answer, if you please to plant some tree or trees in that middle space, you may; and as your trees grow contiguous, great and thick, you may at your pleasure take up those last trees. And this I take to be the chief cause why the most trees stand so thick; for men not knowing (or not regarding) this secret of needfull distance, and loving

The parts of a
Tree.

Waste grounds
in an Orchard