L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

IN

TWELVE BOOKS:

AND HIS

BOOK

CONCERNING

TREES.

Tranſlated into *Engliſh*, with ſeveral Illuſtrations from PLINY, CATO, VARRO, PALLADIUS, and other antient and modern AUTHORS.

Eccleſiaſtes, Chap. V. Ver. 9. *The Profit of the Earth is for All; the King himſelf is ſerved by the Field.*

Eccleſiaſticus, Chap. VII. Ver. 15. *Hate not Husbandry, which the Moſt High hath ordained.*

Virg. Georg. Lib. I. ——— *Pater ipſe colendi*
Haud facilem eſſe viam voluit, primuſque per artem
Movit agros, curis acuens mortalia corda.

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THE

PREFACE.

THE Art of Huſbandry is ſo neceſſary for the ſupport of human life, and the comfortable ſubſiſtence and happineſs of mankind have ſo great a dependence upon it, that the wiſeſt Men in all ages have aſcribed its original to GOD, as the Inventor and Ordainer of it: and the wiſeſt and moſt civilized Nations, who have beſt underſtood their true intereſt, have always endeavoured to promote and improve it; and have never failed to acknowledge, and honour, as public Benefactors, all ſuch as contributed any thing towards the ſame. In antient times, nothing was more honourable than Paſturage and Tillage; for even Princes themſelves did not then think them unworthy of their ſtudy and application.

WITHOUT entering into any detail of the gradual progreſs this Art ſeems to have made in the different ages of the world, it may be ſufficient to obſerve, that, in proportion as either private Families, or Nations of Men, fixed themſelves in ſettled habitations, and applied themſelves to this neceſſary Art, they accordingly proſpered, and increaſed in number and power; and that ſuch as applied themſelves the moſt aſſiduouſly to all the different branches thereof, always made the greateſt figure in the world.

THE *Greeks* applied themſelves very early to this ſtudy, and ſeem to have been great Proficients in it; to which, no doubt, the precepts of their wiſeſt Men, who delighted therein, contributed very much. *Heſiod*, the moſt antient of their Poets, who lived above two centuries before the foundation of *Rome*, inſtructed not only the Men of his own times, but alſo ſucceeding generations; and many of his precepts of Huſbandry have been preſerved to this very day. Many other

learned Men alſo amongſt them improved the knowledge and reputation of this Art to ſuch a degree, that it was very early eſteemed a moſt honourable employment, even not below Royal Majeſty itſelf. Thus we ſee, that *Homer*, that Prince of Poets, who knew the dignity, decency, importance, and value of things more than any Man, in his beautiful deſcription of *Achilles*'s ſhield, contrived and curiouſly wrought by *Vulcan* himſelf, repreſents the King ſtanding in a furrow, with his royal ſceptre in his hand, over-ſeeing the Reapers cutting down the ripe corns, and greatly rejoicing in the fruit of his labours, and his ſervants preparing a dinner for them under an oak. And, no doubt, in after-times, that Art was brought by them to much greater perfection; for that inquiſitive people borrowed knowledge of all their neighbours, and their wiſeſt Men travelled in queſt thereof, into all thoſe countries where they had any expectation to find it.

THE *Greeks*, by their intercourſe and communication with *Italy*, tranſmitted their knowledge and improvements into ſome parts of that delightful country: nevertheleſs it is very probable, that, for ſeveral centuries after the foundation of *Rome*, this Art made but very little progreſs among the *Romans*; nor were they much acquainted with that regular Culture practiſed in *Greece*, *Aſia*, and other Eaſtern countries; but, in proceſs of time, as they extended their dominions, and became acquainted with the neighbouring nations, their knowledge in this Art increaſed; and that wiſe and diſcerning people diſcovered the great and manifold advantages of Agriculture; its natural tendency, not only to ſecure againſt the calamities of famine, to which they had ſometimes been expoſed, but to prevent diſtempers, increaſe the number of their people, harden their bodies, and make them more robuſt, and able to endure the fatigues of a military life, when the ſervice and intereſt of their country ſhould require it; ſo that their greateſt Men, their Generals, Senators, and graveſt Philoſophers, did all they could to encourage and promote it, not only by precept, but by their own example: and though, during the hurry and confuſions of war, it met with great interruption, and advanced but ſlowly, and they could not carry it to that degree of perfection they deſired; yet we ſee, that, in the midſt of their triumphs, after they had ſubdued a rival Republic, they ſeem to have ſeriouſly conſidered the neceſſity of promoting it more effectually: And their Senate, that auguſt aſſembly of diſintereſted Patriots, always intent upon promoting the public good, and far from thinking that they wanted no further inſtruction, ordered the twenty-eight books of *Mago*, a *Carthaginian* General, which he had

had written upon this ſubject, to be tranſlated into *Latin*; and, in this work, ſome Men of the greateſt quality had a principal hand. And by this decree it appears, that the *Romans* were ſenſible, that, in point of Huſbandry, the *Carthaginians* had greatly the advantage of them; which both *Varro* and *Columella* ſeem alſo to acknowledge, by calling *Mago* the *Parent of Huſbandry*.

THE *Romans*, by extending their empire over all *Greece* and *Aſia*, and opening a free communication with all thoſe countries where Huſbandry ſeems firſt to have flouriſhed, made great improvements in this Art, and carried it to great perfection; and, as they extended their conqueſts northward and weſtward, they carried it along with them; and, at length, introduced it into this iſland, where, at their firſt arrival, they, no doubt, found it but very rude and imperfect.

WHAT contributed moſt to the propagation of this uſeful Art, was the great number of books, both in *Greek* and *Latin*, written upon this ſubject by Authors not only eminent for learning, but of exalted ſtation and quality; ſome of which have been preſerved to this day: and, as none of them have treated of it ſo copiouſly, in all its different branches, as *Columella*, who ſeems to have made it the ſtudy and the buſineſs of his whole life, and to have peruſed all the Authors that went before him, there is reaſon to think, that a tranſlation of this polite Author into *Engliſh* will be looked upon rather as a work of ſome uſe and advantage, than of mere curioſity and amuſement; eſpecially if it be conſidered, that he has given us not only a complete ſyſtem of the *Roman* Huſbandry, but alſo a diſtinct account of the private œconomy of that wiſe and prudent people; for, by the many wiſe precepts and directions he gives, relating to this laſt, we may eaſily obſerve, what was their method in the management and government of their Families; which, if carefully imitated, as far as different circumſtances will allow, might, even at this preſent time, contribute greatly to the intereſt and regular government of the greateſt Families. Or even ſuppoſe no further advantage were to be expected from ſuch a performance, but the gratification of our curioſity, which certainly is not the caſe; yet, even in this light, it is hoped, it will not be unacceptable to ſuch as are not well acquainted with the original, and cannot otherwiſe have the ſatisfaction they may innocently deſire; for, in matters of far leſs importance than moſt of the things here treated of, the politeſt Nations in *Europe* have always received kindly every attempt to make them acquainted with whatever had any relation to that great people; eſpecially this Nation, in which

which has been ſo long preſerved that noble, generous, free, independent, and public ſpirit, which was once the glory of that Republic, before luxury, covetouſneſs, and ambition, had corrupted Mens hearts.

In *Italy*, *France*, and *Germany*, attempts have been made to tranſlate this celebrated Author into their reſpective languages; whether any ſuch attempt has been made in this kingdom, I know not: ſome bits and ſcraps, here-and-there, I have indeed ſeen in *Engliſh*; how much mangled, miſrepreſented, and miſunderſtood, in many inſtances, is obvious enough to ſuch as are judges, and will be at the pains to conſider them. To vindicate ſo polite an Author from any injuſtice of this nature, to perpetuate his memory, and make him more known and uſeful to the world, are motives ſufficient enough to juſtify an attempt to give a full and juſt Tranſlation. Whether theſe, or any other motives, have determined me to undertake this work, I believe nobody will think it worth their while to inquire. If I ſhould ſay, it was a deſire to profit and pleaſe the public, it would be received with deſerved contempt, as the common pretence of the moſt frivolous undertakings: tho', perhaps, good-nature may be apt to think, that my not having levied contributions by ſubſcriptions, but printed it at my own expence, is a ſtrong preſumption of the truth of ſuch an aſſertion. What moſt concerns the Purchaſer or Reader, if any vouchſafe to be ſuch, is to know, whether the work be tolerably well done: this is humbly ſubmitted to the judgment of ſuch as underſtand the original: overſights, and miſtakes in ſmall matters, notwithſtanding all the care taken to avoid them, probably there are many; but as to capital errors, in perverting the ſenſe of the Author, in things eſſential, and of greater importance, it is hoped there are few. I have endeavoured to give his meaning in as plain and intelligible words as I could, without adding or diminiſhing; and have been ſcrupulouſly careful only to tranſlate, and not to make a commentary, ſo that to ſome, it is probable, the Tranſlation may appear rather to be too literal. I have been obliged to retain many original words, which cannot be rendered without a long circumlocution, there being no words in our language exactly anſwering to them; and, as theſe words often recur, the ſame circumlocutions would have been a blemiſh in the Tranſlation: I therefore thought it better to give an explication of them apart by themſelves, to which the Reader may have recourſe, till they become familiar to him. Thus, for inſtance, *jugerum* was a common meaſure of land amongſt the *Romans*, as an

Acre

Acre is amongſt us; but if it were tranſlated by *Acre*, as is commonly done, it would give the Reader a falſe notion of the thing, becauſe the Engliſh *Acre* is above one third larger than the Roman *jugerum*. Thus all their meaſures of capacity, both liquid and dry, as *culeus*, *amphora*, *urna*, *modius*, *congius*, *ſextarius*, *hemina*, *cyathus*, *ligula*, &c. cannot be rendered by any names of meaſures in common uſe amongſt us; for none of them, from the greateſt to the ſmalleſt, do exactly correſpond: therefore it was neceſſary to retain them, and the Reader may eaſily ſatisfy himſelf, by turning to the ſhort account I have given of them.

As the whole of this Tranſlation ſtands in need of indulgence, ſo no part of it ought more humbly to deprecate the ſeverity of the Critic, than that of the citations from *Virgil*, and of the Tenth Book, which is all in Hexameter verſe. It would not have given any great ſatisfaction to have tranſlated them into proſe: therefore, that the whole might bear ſome reſemblance to the original, I have endeavoured to render them into blank verſe: but, as this is a province I am but very little acquainted with, I hope the defects of this performance will be overlooked; ſeeing I have only endeavoured to expreſs the meaning of the Author, without any pretended ornamental additions of my own, confining myſelf to his own thoughts, and rarely adding an epithet to fill up a line, but what naturally belongs to the ſubject, and is included in the text.

As to the explanatory Notes which I have added to the Tranſlation, I know very well, that ſome of them will be regarded by many as mere puerilities, and little accounted of by ſuch as are of a more delicate taſte: but it ought to be conſidered, that this Tranſlation is not at all deſigned for ſuch as can readily make uſe of the original, and are acquainted with claſſical learning: to ſuch, no doubt, both the Tranſlation and the Notes will be but very inſipid, and of no uſe at all; but to ſuch as are not of this character, yet have a deſire to know ſomething of the *Roman* Huſbandry, and domeſtic Oeconomy, it is hoped the Notes will not be altogether uſeleſs and unacceptable: for, as the Author frequently makes mention both of perſons, places, and things, which probably they have little or no notion of, it is reaſonable to ſuppoſe, that a brief account of them will not be altogether diſagreeable, ſince nothing more is intended, than, by theſe ſhort and imperfect hints, to make the Tranſlation more intelligible and agreeable to them. I have ſometimes alſo taken notice of ſome different

readings, and doubtful phraſes and words, in order to give occaſion to ſome judicious perſon, who may caſt an eye upon them, to make ſome attempt to rectify them.

I WAS not unacquainted with the difficulty of tranſlating this Author, ſo as to give any tolerable ſatisfaction either to myſelf or others, and even with the impoſſibility of rendering into *Engliſh* many things mentioned by him, and of finding proper words in the vaſt variety of things which he treats of; and that learned Men are not at all agreed about the *Engliſh* names of ſeveral herbs, trees, ſhrubs, fiſhes, fowls, *&c.* which exactly anſwer to their *Greek* and *Latin* names: but, as this is no hindrance at all to the right underſtanding of the moſt eſſential things, and of the general rules and directions, and other things of the greateſt importance, both in Huſbandry and Oeconomy, I cannot think but it is better to have a Tranſlation, with ſome imperfections of no great importance, than to have no Tranſlation at all. In the names of herbs, trees, ſhrubs, *&c.* I have followed ſome of our beſt Authors, particularly the ingenious Mr. *Miller*, whoſe knowledge in theſe things is well known to the world: and, in the proportion that the *Roman* meaſures, both of length and capacity, bear to the *Engliſh*, and in ſome other things, I could not follow a ſafer guide than the learned Dr. *Arbuthnot*. In the great variety of different readings of the Text, I have choſen what I thought the moſt probable; but, for the moſt part, I have followed that excellent edition publiſhed by the learned *Geſnerus*, Profeſſor of Eloquence and Poetry at *Ottinghen*, whoſe vaſt labour, and judicious obſervations, have greatly contributed to make not only *Columella*, but the other *Roman* writers upon Huſbandry, more intelligible, and to reſtore them to their original purity.

As to *Columella* himſelf, we can know very little of him, but what we gather from his own words in this Treatiſe: *Pliny* indeed, and *Palladius*, often mention him; and *Vegetius*, who, in his Treatiſe of Farriery, frequently borrows from him, commends his flowing eloquence; yet they give us no further account of him. It ſeems evident enough, that he was a *Spaniard*; for *lib.* viii. *cap.* 16. he intimates, that he was a Citizen of the municipal city of *Cadiz*, *noſtro Gadium municipio*. He ſeveral times makes mention of his uncle *Marcus Columella*, as a perſon of great note and diſtinction, and as having an eſtate in the Province of *Bætica*: probably he was born of *Roman* parents;

Parents; for, no doubt, many *Romans* ſettled in that delightful country.

It does not appear at what time he removed to *Rome*; but there is ſome reaſon to think, that it was in the reign of *Tiberius*, if not before; for he ſays in his Third Book, that he had poſſeſſed lands many years in the Territory of *Ardea*, and that he wrote his Eleventh Book at the deſire of one *Claudius Auguſtalis*, a young man of ſome learning and diſtinction. That this *Claudius* is the ſame who was afterwards Emperor, cannot indeed be affirmed for certain; yet it is not altogether improbable: for *Tacitus* tells us, that *Tiberius* made him a Fellow of the College of Prieſts, which he had inſtituted in honour of *Auguſtus*: and I know no reaſon why he may not be the perſon mentioned by our Author, who, probably, would neither have been influenced by him to write the ſaid Book, nor would he have given him ſo honourably a character, if he had not been of ſuperior rank; and the character given is, according to *Suetonius*, applicable to *Claudius* in his younger years. He ſpeaks of *Cornelius Celſus* and *Julius Atticus*, as Men of his own time; and it is certain the firſt flouriſhed in the reign of *Tiberius*. He ſeveral times makes mention of *Julius Græcinus*, without any intimation of the hard fate of that good Man, who was put to death by the Emperor *Caligula*; ſo that there is ſome reaſon to think, that he was living when *Columella* wrote. If what is above ſaid be true, then he wrote a part of this Treatiſe in the reigns of *Tiberius* and *Caligula*.

In his Third Book he mentions *Annæus Seneca* as then living, and commends him for his great learning; but ſays nothing of his being advanced to the dignity of a Senator, nor of his being entruſted by *Claudius* with the education of *Nero* his adopted Son and Succeſſor; which, probably, he would have taken ſome notice of, if *Seneca* had been then promoted to theſe dignities: ſo that it is reaſonable to think, that he wrote this Book, at leaſt, ſome time before this happened; probably in the firſt years of the reign of *Claudius*, who, in the ſeventh or eighth year thereof, adopted *Nero*, and committed him to the care of *Seneca*, the ſaid *Nero* being then eleven or twelve years of age; and *Claudius* dying five or ſix years after, *Nero* ſucceeded, being only ſeventeen years old, according to *Suetonius*, and, as *Euſebius* ſays, in the year of our Lord 55. at which time, it is probable, *Columella* had finiſhed his whole work. There is only one thing

which may give reaſon to think, that it was ſome time after this before he finiſhed it; *viz.* in his Firſt Book, *cap.* 7. he makes mention of *L. Voluſius*, a very old rich Man, of Conſular dignity; and his words ſeem to intimate, that he was then dead. But *Tacitus* ſays, that this *Voluſius* died aged ninety-ſeven, in the 809th year of *Rome*, which was the 56th year of our Lord. If *Columella*'s words muſt be ſo underſtood as to ſignify, that *Voluſius* was dead when he ſpoke of him, then we muſt conclude, that it was ſome time after this before he publiſhed his work; but it was in *Seneca*'s life-time, who was put to death by *Nero*, *Anno Domini* 65. Notwithſtanding all that has been ſaid, the preciſe time, either of his writing or publiſhing it, cannot be determined. I doubt not he employed many years about it, and wrote ſome parts of it in all the reigns above-mentioned; and that he did not write all the Books in the order they are now placed, ſeveral of them having no dependence on the foregoing; and that a great part of the Firſt Book, being a Preface to the whole, was written laſt of all. However, it is evident enough, that he wrote in *Rome*, or in ſome part of *Latium*, by his manner of expreſſion ſometimes in mentioning theſe places.

THIS Treatiſe of Huſbandry conſiſts of Twelve Books, in which he has touched upon ſuch a vaſt variety of things, and explained all the different branches of the Art with ſuch perſpicuity, and delivered his precepts with ſo great judgment, as ſhow him to have been perfectly maſter of his ſubject; and, throughout the whole, there are ſo many evidences of his having been ſo well acquainted with all the different parts of learning; and that he had ſo carefully examined all the Authors, both *Greek* and *Latin*, that had treated of the ſame ſubject before his own time; and that to his theory he had added his own experience; as give us abundant reaſon to think, that no Man could ever have been better qualified to undertake ſuch a work: ſo that the character he gives to *Marcus Columella*, his uncle, may very juſtly be applied to himſelf, *Vir acris ingenii, & omnibus diſciplinis inſtructus, illuſtriſque Agricola*; having, to all his other opportunities of improvement in knowledge and experience, added that of travelling into foreign countries; for he tells us, that he had been in *Syria* and *Cilicia*; and it is not probable, that a Man of his character would paſs by *Greece* without viſiting it. All theſe Twelve Books he inſcribes to one *Publius Silvinus*, of whom he gives us no particular account; only inſinuates, that, at his deſire and requeſt, he had undertaken

undertaken and carried on the ſaid work. We may reaſonably think, that this *Silvinus* was a perſon of ſome conſiderable note and diſtinction, by the reſpectful manner in which he always addreſſes himſelf to him; and, as *Columella* mentions ſome lands that they both had amongſt the *Ceretani*, a people in *Spain*, it is not improbable, that he alſo was a *Spaniard*.

BESIDES theſe Twelve Books, inſcribed to *Silvinus*, there is a Book concerning Trees, wherein there is no mention made of him. This ſingle Book appears to be a part of a former Eſſay of *Columella*'s upon Huſbandry; for, in the very beginning, there is mention made of a preceding Book concerning the Culture of Lands. What ſeems moſt probable is, that *Columella* having at firſt written more briefly upon this ſubject, it was ſo well received, that, at the preſſing deſire of his friends, he inlarged it, and put it into a new form, as we have it now, in Twelve Books; which being a complete Syſtem of Huſbandry, his firſt Eſſay came to be leſs uſed, as being leſs perfect, and afterwards a part of it was loſt: this ſome Tranſcribers, and the firſt Editors, not having conſidered, placed it as the Third Book of his Huſbandry; which confounded the order of the whole, as has been more fully taken notice of in the Note annexed to this ſingle Book.

COLUMELLA wrote upon ſeveral other ſubjects beſides Huſbandry. He tells us, *lib.* xi. *cap.* 1. that he had written againſt Aſtrologers; not thoſe who only obſerved the motions of the heavenly bodies, and made conjectures of what probably might, or commonly did, happen before, or after, or at the riſing and ſetting of certain Stars; but ſuch as he calls *Chaldæans*, who vainly pretended to foretel, with certainty, what alterations would happen in the air and weather, upon ſuch and ſuch days, *&c.* He alſo had formed a deſign to write of the Luſtrations and Sacrifices in uſe among the Antients, for preſerving the fruits of the ground, *&c.* But, whether he ever finiſhed this work, is very uncertain; and I do not find, that any other thing, beſides his Huſbandry, has been preſerved to our days. He was a great admirer of *Virgil*, and cites him upon many occaſions; but ſeldom without ſome epithet or other, expreſſive of the great veneration and regard he had for him, and of the deference he paid to his judgment. He ſeems not only to have been a great lover of Poetry, but alſo no mean Poet himſelf; of which he has given

ſufficient evidence in his Tenth Book, which, he ſays, he wrote in verſe, not only to gratify *Silvinus*, but alſo in obedience to *Virgil*, who recommended that ſubject to the care of ſome future Poet: and, conſidering the nature and difficulty thereof, he has ſucceeded very well. He has not, indeed, greatly embelliſhed his Poem with many new poetical conceits of his own, but he has introduced into it ſeveral old fabulous ſtories, and applied them dextrouſly enough to his own purpoſe: but, as his buſineſs was rather to inſtruct than to amuſe, it is rather an advantage than a blemiſh to it, that it conſiſts more of brief deſcriptions, and of plain directions and precepts, than of fictions; his expreſſion, for the moſt part, being both poetical, natural, and agreeable enough.

His ſtyle, in the opinion of all good judges, is exceeding polite and elegant: and though the ſubject he treats of, and the perſons for whoſe uſe he principally wrote, did not allow any great diſplay of eloquence; yet, upon all occaſions, he has ſo eaſy and natural a way of expreſſing himſelf; and, in different places, uſes ſuch a vaſt variety of words and phraſes to expreſs one and the ſame thing (which by no means darken, but greatly illuſtrate the ſubject); and in the beginning and concluſion of ſeveral of his Books, and in ſome other places of his work, he has given ſuch remarkable inſtances of his eloquence, that he may very juſtly be reckoned amongſt the moſt polite *Roman* writers; and, if he had applied himſelf to that ſtudy, he would, no doubt, have been ranked among the moſt eloquent Orators.

He ſometimes ſeems to recommend to Huſbandmen ſome practices, which ſeem rather to be mere ſuperſtitious cuſtoms, than to have any foundation in Nature: but, as ſuch things frequently occur in the beſt *Roman* Authors, and as the manner in which he mentions them ſhows that he laid no ſtreſs upon them, but rather reported them as things in common practice; theſe ſmall deformities ought not to make any abatement of our value and eſteem: for it muſt be ſaid, that there are few antient Authors ſo much exempted from ſuperſtitious and groundleſs prejudices as *Columella*, who ſeems to have been a declared enemy to that ſort of Men, who contributed moſt to eſtabliſh and cheriſh them.

It is very remarkable, that in no part of his work he has given us the leaſt intimation, under whoſe adminiſtration public affairs then were, nor under whoſe Conſulſhip he lived when he wrote any part of it; nor does he make the leaſt reflection upon the ſtate of public affairs; which ſhows his extreme caution, and the difficulty of the times he lived in: but he has not uſed ſo much reſerve with reſpect to the temper and diſpoſition, and the moral character, of the generality of mankind at the time he wrote; for he tells us very plainly, that the antient frugality, parſimony, temperance, moderation, and induſtry, were no more in faſhion, yea, in a great meaſure, extinct and gone; and that unbounded luxury, ambition, covetouſneſs, intemperance, and idleneſs, had ſucceeded in their room; that open robberies and depredations were carried on, even in the place of juſtice itſelf, by calumniating and accuſing the innocent rich Man, in order to get poſſeſſion of his eſtate: that the eloquent tongue, formerly employed in defence of the innocent and oppreſſed, was become mercenary and venal, and exerted itſelf in the defence and ſupport of the guilty: that Men of eſtates, who formerly reſided much in the country, governed their own families, and managed their own affairs, had committed the management of all to Bailiffs and Stewards, and had, in a great meaſure, deſerted the country, and lived in town, abandoning themſelves wholly to the pleaſures and diverſions of the ſame: that their Wives, not, as formerly, ſtriving to excel in all parts of Houſwifry, and taking upon themſelves the whole burden of domeſtic affairs within-doors, were become ſo delicate, and ſuch lovers of the town, that they could not endure to paſs a few weeks in the country, and thought it greatly below themſelves to caſt their eyes upon the inſtruments of Huſbandry; that, inſtead of manufacturing wool and flax at home for their own and their family's uſe, as the celebrated *Roman* Matrons were formerly wont to do, they could not endure home-made clothes, but, by flattering careſſes, obtained of their Huſbands ſuch as were more coſtly; to purchaſe which, they often expended almoſt their whole yearly income: that Men, by their diſſolute and intemperate living, and perverting the natural order of things, by turning night into day, and day into night, had ſo diſſipated and waſted their natural ſtrength, and their bodies were ſo enervated, that they were almoſt dead while alive, and death ſeemed to make no great alteration upon them, ſo that they ſoon became uſeleſs both to themſelves, and to their country:

that

that many chose rather, by servile attendance, vain expectations, and fruitless solicitations, to consume their time, and their substance, than, by carefully improving and cultivating their paternal inheritance, raise for themselves a comfortable and honourable subsistence and revenue, free from all abject and slavish dependency. This shameful degeneracy from the virtue of their Ancestors, and general corruption of manners, at length proved fatal to the *Roman* state; and, generally speaking, the same causes produce the same effects.

THE

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A Brief Explication of a few Original Words retained in this Tranſlation.

Jugerum, a ſuperficial meaſure of land among the *Romans*, conſiſting of Engl. Feet. Dec. 28800 *Roman* feet, which make 27849,60. See a further account of it *lib.* v. *cap.* 1.

Modius, a dry meaſure of capacity, which contained a little more than a *Winchester* peck. See it further explained *page* 64.

Ligula ſignified at firſt a ſpoon, but was afterwards uſed as a meaſure, and is the ſmalleſt mentioned by *Columella*, and very little more than the 48th part of a pint.

Cyathus, a meaſure of liquid things: it contained 4 *ligulæ*, and was a little more than the 12th part of a pint.

Hemina contained 24 *ligulæ*, or ſix *cyathi*, and was a little more than half a pint.

Sextarius, a meaſure both of liquid and dry things: it contained two *heminæ*, 12 *cyathi*, or 48 *ligulæ*: it made a little more than a wine-pint; and it was ſo called, becauſe it was the ſixth part of the *congius*.

Urna, a meaſure of liquid things, which contained 24 *ſextarii*, and amounted, in *Engliſh* meaſure, to 3 gallons 4 $\frac{1}{2}$ pints, and a ſmall fraction more.

Amphora, contained 2 *urnæ*, or 48 *ſextarii*, amounting, in *Engliſh* meaſure, to 7 gallons, one pint, and a ſmall fraction of a pint: it was alſo a meaſure of liquid things.

Culleus or *culeus*, the greateſt meaſure of liquid things among the *Romans*: it contained 20 *amphoræ*, in *Engliſh* meaſure 143 gallons, 3 pints, and a ſmall fraction. See a more diſtinct account of theſe larger meaſures in *page* 118.

Seſtertius, a *Roman* coin, of the value of two *aſſes* and *a half*; four of them made a *denarius*, which, by the beſt judges, is computed to be worth 7 *d.* $\frac{3}{4}$. *Engliſh* money. See a further account of it in *page* 119.

To *ablaqueate*, is to dig round a vine, or any other tree, in order to lay its roots bare, and expoſe them to the Sun, Wind, and Rain, and to cut off the ſuperfluous roots, *&c.* See *page* 168.

To *pamſinate*, is to ſtrike off the ſuperfluous ſhoots and twigs of vines, in order to make them more able to nouriſh their fruit, *&c.* See *page* 196.

To *ſarcle*, or *ſarculate*, is to move the ſurface of the ground hardened by the Sun, *&c.* in order to make it imbibe the Rain, and admit the warmth of the Sun, that ſo what grows upon it may thrive the better.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK FIRST.

The PREFACE. *To* PUBLIUS SILVINUS.

I frequently hear the principal men of our city blaming, ſometimes the unfruitfulneſs of the ground, at other times the intemperateneſs of the weather, as hurtful to the fruits of the earth for many ages now paſt: ſome alſo I hear mitigating, in ſome meaſure, as it were, the foreſaid complaints, becauſe they are of opinion, that the ground, being, by its overmuch fruitfulneſs during the former part of its duration, become barren, and worn out of heart, is not now able, with its wonted bounty, to afford ſuſtenance to mortals. Which cauſes, *Publius Silvinus*, I am fully perſuaded, are very remote from the truth; becauſe it is neither lawful to think, that the nature of the ground, which that original Former and Father of the univerſe endowed with perpetual fecundity, is affected with barrenneſs, as with a certain diſeaſe; nor does it become a wiſe man to believe, that the earth, which, having a divine and everlaſting youth beſtowed upon it, is called the *common parent* of all things, becauſe it has always brought forth, and will henceforth bring forth, all things whatſoever, is grown old, like a woman.

(1) Nor, after all, do I think, that theſe things befal us from the diſtemperature of the weather; but rather from our own fault, who commit our Huſbandry to the very worſt of our ſervants, as a criminal to a public executioner, which all the beſt of our anceſtors were wont to treat with the greateſt gentleneſs: and I cannot enough wonder, why they, who deſire to learn eloquence, are ſo nice in their choice of an orator, whoſe eloquence they may imitate; and they, who ſearch after the knowledge of ſurveying or menſuration, and of numbers, look out for a maſter of the art they delight in; and they, who are deſirous of ſome ſkill in dancing and muſic, are exceeding ſcrupulous in their choice of one to modulate their voice, and teach them to ſing agreeably; and no leſs of a dancing-maſter, to regulate the geſtures and motions of their body; alſo they, who have a mind to build, ſend for architects, maſons, and carpenters; and they, who reſolve to ſend ſhips to ſea, ſend for ſkilful pilots; they, who make preparations for war, call for men, who underſtand the art of war, and are acquainted with military affairs; and, not to mention every particular, in that ſtudy which every one reſolves to proſecute, he makes uſe of the wiſeſt and ableſt director he can find; finally, every one ſends for a perſon from the ſociety and aſſembly of the wiſe, to form his mind, and inſtruct him in the precepts of virtue: but Huſbandry alone, which, without all doubt, is next to, and, as it were, near akin to wiſdom, is in want of both maſters and ſcholars. For hitherto I have not only heard, that there are, but I myſelf have ſeen, ſchools of profeſſors of Rhetoric, and, as I have already ſaid, of Geometry, and of Muſic; or, which is more to be wondered at, academies for the moſt contemptible vices, for delicately dreſſing and ſeaſoning of victuals, for contriving and making up dainty and coſtly diſhes for promoting gluttony and luxury; and I have alſo ſeen head-dreſſers and hair-trimmers; but, of Agriculture, I have never known any that profeſſed themſelves either teachers or ſtudents.

For, even ſuppoſe the city ſhould want profeſſors of the foreſaid arts, nevertheleſs the commonwealth might be in a very flouriſhing condition, as in antient times; for, of old, cities were happy enough, and will hereafter ſtill be ſo, without ludicrous arts, yea, even without

(1) *Pliny*, in his *Natural Hiſtory*, *lib.* 18. *cap.* 2. ſays, that the cauſe of the former plenty was, that the ground was at firſt cultivated by the hands of Generals, Conſuls, Tribunes, and Senators; but afterwards by Slaves, Criminals, and Malefactors, who bore upon their bodies the marks of their infamy, and did not cultivate it ſo carefully as thoſe men of honour and virtue did.

advocates

advocates alſo (2) : but without Huſbandmen, it is manifeſt, that mortals can neither ſubſiſt, nor be maintained. For which reaſon, what is come to paſs, is the more like a prodigy, that a thing ſo neceſſary and convenient for our bodies, and the advantages of life, ſhould, to this very time, of all things whatſoever, have had the leaſt conſummation ; and that this perfectly innocent way of enlarging and preſerving one's patrimony ſhould be deſpiſed. For thoſe other different, and, as it were, repugnant ways of doing this, are contrary and diſagreeable to juſtice ; unleſs we think it more agreeable to equity to have acquired booty by a military profeſſion, which brings us nothing without blood and ſlaughter, and the ruin and deſtruction of others. Or, to ſuch as hate war, can the hazard, uncertainty, and danger of the ſea, and of trade, be more deſireable ? That *Man*, a terreſtrial animal, breaking through the boundary and law of nature, and expoſing himſelf to the rage of the winds and ſea, ſhould dare to commit himſelf to the waves, and, after the manner of the fowls of the air, always a ſtranger upon a far diſtant and foreign ſhore, wander over the unknown world ? Or is uſury, which is odious, even to thoſe whom it ſeems to relieve, more to be approved ? Or is, forſooth, that canine ſtudy and employment, as the antients called it, of ſnarling, and barking at, and ſlanderouſly accuſing every man of the greateſt ſubſtance ; and that open robbery of pleading againſt the innocent, and for the guilty, which was neglected and deſpiſed by our anceſtors, but even permitted and allowed of by us within the walls, and

(2) *Cauſidicus*, an appellation not very honourable amongſt the *Romans*. *Quintilian*, in his *Inſtitutions*, *lib.* 2. avoiding harſher terms, calls him *vocem mercenariam*, *inutilem litium advocatum*, a mercenary tongue, a promoter of law-ſuits, a wrangling advocate. Our author ſeems to have had men of this character in great contempt, who employed their eloquence either in pleading for the notoriouſly wicked, or againſt innocent perſons. If the word *Cauſidic* were as well known as the word *Advocate*, it would be more expreſſive of the thing.

In our author's days, the *Romans* had loſt their liberty, and were under a very tyrannical government ; and, no doubt, many of them, being greatly diſſatisfied with their preſent ſtate, by their murmurings, and otherwiſe, made themſelves obnoxious to the diſpleaſure and reſentment of their oppreſſors, who, by proſcriptions, endeavoured to deſtroy all they ſuſpected to be their enemies ; and many of the orators of thoſe days became informers and accuſers ; and, it ſeems, always pitched upon the richeſt, with a view to a ſhare of the plunder. It is this *canine* eloquence, as they called it, which our author cenſures : *eloquence* employed in defence of innocence, and againſt the guilty, in ſupport of truth againſt falſhood and calumny, and eſpecially in directing the public counſels, appeaſing popular commotions, and correcting public errors, is a divine endowment ; in all ages had in the greateſt reputation by the wiſeſt nations, and juſtly promoted to the greateſt honours : otherwiſe it is a very dangerous talent, eſpecially in countries where haranguing and pleading at the bar is much in uſe, if the judges are not very ſharp-ſighted, to diſcern true reaſon from ſophiſtry.

in the very *Forum* itſelf (3), more excellent and honourable? Or, ſhould I reckon more honeſt and honourable, the moſt deceitful, lying, and beggarly hawking of a mercenary levee-haunter, who is conſtantly flying about from the threſhold of one great man in power to that of another, and gueſſing, by the report of others, whether his patron is awake, or not? Nor, indeed, do the ſervants vouchſafe to anſwer him, when he aſks what is a doing within-doors: or, ſhould I think it more fortunate, after having met with a repulſe from the porter with his chains upon him, to loiter and hang about the ungrateful and hateful doors, oft-times till it be late at night, and, by a moſt mean and pitiful ſervitude and attendance, purchaſe with diſgrace the honour of the *Faſces* (4), or a government, or a command in the army or navy, and, after all, ſquander away one's own patrimony? For honour is not beſtowed, as a reward, upon diſintereſted ſervice and attendance, but upon ſuch as make preſents, and give bribes.

Now, if all good men ought to avoid theſe very things, and others like to them, there is ſtill remaining, as I ſaid, one way of increaſing one's ſubſtance, worthy of a freeman, and a gentleman; which ariſes from Huſbandry, of which if the precepts were put in practice, ſuppoſe it were but imprudently, by ſuch as have not been inſtructed in it, provided nevertheleſs they were poſſeſſors and proprietors of the lands, which they cultivate, as was the antient cuſtom, rural affairs would ſuffer leſs damage; for the induſtry and diligence of the maſters, would, in many things, compenſate the loſs occaſioned by ignorance; and they, whoſe own intereſt lay at ſtake, would not appear to be all their life-time willingly ignorant of their own buſineſs; but thereby becoming more deſirous of learning, would attain to a thorough knowledge of Huſbandry.

Now we diſdain, and think it below us, to live upon, and cultivate our own lands ourſelves, and look upon it as a matter of no moment, to make choice of a man of the beſt ſenſe and ſkill we can find, for our Bailiff; or, if he be ignorant, at leaſt, of a man of vigour, vigilance, and activity, that he may learn the more ſpeedily what he is ignorant of. But, whether he be a rich man that purchaſes a piece of ground, he picks, out of his crew of footmen and chairmen, one that is the feebleſt, and the moſt worn out with years, and baniſhes

(3) *Forum* ſignifies the building, or place, where public courts of juſtice were held; and matters of judgment pleaded and decided; or the court of juſtice itſelf.

(4) *Faſces* were the public enſigns of magiſtracy among the *Romans*, being a bundle of rods, with an ax, tied together, and carried before the magiſtrate.

him

him into the country: whereas that buſineſs requires, not only knowledge, but green age, and ſtrength of body, to bear labour and fatigue: or if he be maſter of a middling eſtate, he commands one of his hirelings, who now refuſes to pay that daily tribute of ſervice required of him, and cannot thereby increaſe his income, to be director and overſeer, who is ignorant of the buſineſs he is to have the overſight of (5). Which things when I obſerve, frequently conſidering and revolving in my mind, with how baſe and ſhameful an agreement and conſent rural diſcipline is deſerted, and worn out of uſe, I am in dread, leſt it ſhould be accounted villainous, and, in ſome meaſure, ſhameful and diſhonourable, for free-born men. But when, by the records and writings of many authors, I am put in mind, that our worthy anceſtors looked upon it as their glory, to take care of their rural affairs, and to employ themſelves in Huſbandry, from which (6) *Quintus Cincinnatus* came, and reſcued the beſieged Conſul and his army, being called from the plough to the Dictatorſhip; and again, having laid down the *Faſces*, which, *when a Conqueror*, he more haſtily ſurrendered, than he had aſſumed them when he was made *General*, he returned to the ſame ſteers, and his ſmall manor of four *jugera* of land, left him by his anceſtors (7): and *CaiusFabricius* alſo, and

(5) *Ex mercenariis, aliquem jam recuſantem, quotidianum illud tributum*, there ſeems to be ſomething wanting in this ſentence, to make it more intelligible, which I cannot pretend to ſupply: the intention of it muſt either be what I have expreſſed, or perhaps it may ſignify, that one of the hired ſervants, who refuſes to ſerve for common wages, is promoted to the office of a Bailiff.

(6) *Quintus Cincinnatus* was made Dictator during the Conſulſhip of *L. Minutius Carbetus*, and *C. Nautius Rutilius* III. *Anno* 296. from the building of *Rome*. The meſſenger from the Senate found him ploughing his four *jugera* of land, which he had in the *Vatican*, and which, from him, were called the *Quintian Meadows*. It is ſaid, he was naked, and all covered over with ſweat and duſt. The occaſion of his being choſen Dictator, was, becauſe the Conſul *Minutius*, and his army, were beſieged in their camp by the enemy, and were in danger of being made priſoners of war. This ſtory is elegantly told by *Livy*, *dec.* 1. *lib.* 3, who ſays, it is worth their while to hear it, who deſpiſe all human things, in compariſon of riches; and think, that there can be no place, either for great honour, or for valour and virtue, but where there is great affluence of riches.

(7) *Columella* calls theſe four *jugera* of land, his *prædiolum avitum*, as if they came to him from his anceſtors; which is contrary to what *Feſtus* ſays, *viz. That the* Quintian Meadows *were ſo called, from* Quintus Cincinnatus, *becauſe, after his Son was condemned, he ſold all that he had, and purchaſed four* jugera *of land beyond the* Tyber. They made near two *Engliſh* acres and a half.

The *jugerum*, which many of our *Engliſh* tranſlators render *Acre*, was much ſmaller than the *Engliſh* acre; and it only impoſes upon the reader, and gives him a falſe idea of this meaſure, to tranſlate it thus; ſo that I think it better to retain the original word, and give an explication of it in a note, than, by tranſlating it *Acre*, convey a falſe notion to the mind of the reader.

The

and *Curius Dentatus* (8); the one, after having driven *Pyrrhus* (9) out of the confines of *Italy*; and the other, after he had ſubdued the *Sabines*, did no leſs induſtriouſly cultivate, than they had bravely gained with their ſwords, their dividend of ſeven *jugera* of land a man, which they received of the land they had taken from the enemy.

And that I may not now unſeaſonably make mention of them one by one, when I behold ſo many other renowned and memorable Captains of the *Roman* nation, who were always in great reputation for this two-fold ſtudy; either of defending, or of cultivating, their paternal or acquired eſtates; I perceive, that the antient cuſtom, manners, and manly life of our anceſtors, are diſagreeable to our luxury, and voluptuous delicacy. For (as *Marcus Varro* (10) formerly complained in our grandfathers times) *all we, who are maſters of families, having abandoned the pruning-hook, and the plough, have, in a ſneaking manner, crept within the walls; and rather move our hands in the Circus* (11) *and Theatres, than in our corn fields and vineyards:* and with aſtoniſhment we admire the poſtures of effeminate wretches; becauſe, by their woman-like motions, they counterfeit

The *Roman jugerum*, as our author informs us, conſiſted of 28,800 ſquare feet, whereas the *Engliſh* acre conſiſts of 43,560 ſquare feet, which is about a *Roman jugerum* and a half; and, according to the neareſt computation, the *jugerum* conſiſts of 2 *roods*, 18 *ſquare poles*, 250,05 *ſquare feet*; and the proportion it bears to the *acre*, is very near as 10 to 16; and the *Roman* foot, according to the *Engliſh* ſtandard, is 11,604 inches.

(8) *Curius Dentatus*, *an. urb.* 479. conquered *Pyrrhus*, and drove him out of *Italy*, and triumphed over him. *Plin. Nat. Hiſt. lib.* 8. *cap.* 16. *Florus*, *de Bello Tarentino* deſcribes this war, victory, and triumph, very elegantly; and, *lib.* 1. *cap.* 18. ſays, that, *Curius* preferred his own earthen ware to all the gold of the *Samnites*; and that *Fabricius* rejected the offers of *Pyrrhus*, who would have made him Partner in the Government, if he would have betrayed his country. *Pliny* ſays, that they had but one ſaltſeller, and the bottom of it was of wood.

Fabricius, when Cenſor, removed *Ruffinus*, a man of conſular dignity, from the Senate, becauſe he had ten pounds of plate, judging it great luxury; and forbid the moſt warlike Generals to have more ſilver plate than one goblet, and a ſaltſeller. In thoſe days, the Generals baggage coſt the public very little, and was no great incumbrance to the army. *Plin. Nat. Hiſt. lib.* 23. *cap.* 12. *Val. Max. lib.* 4. *cap.* 3. The ſeven *jugera* theſe two Generals poſſeſſed, amounted to 4 ⅛ *Engliſh* acres.

(9) *Pyrrhus*, King of *Epirus*, was called by the *Tarentinians* to their aſſiſtance againſt the *Romans*: he fought with them ſeveral times very ſucceſsfully, and reduced them to very great danger.

(10) *Marcus Terentius Varro* has theſe words in his ſecond book of Husbandry: he was a famous philoſopher and hiſtorian, and reckoned the moſt learned man among the *Romans*. Beſides his books *de Re Ruſtica*, *et de Lingua Latina*, which are ſtill extant, he wrote forty-one books of Antiquities, and ſeveral other tracts mentioned by ſeveral authors. He lived a few years before *Cicero*.

(11) The *Circo's* were places ſet apart by the *Romans*, for the celebration of ſeveral ſorts of games, generally of an oblong figure, walled round, with ranges of ſeats for the conveniency of the ſpectators.

a ſex

a ſex which nature has denied to men; and deceive the eyes of the ſpectators. Then, preſently after, that we may come in good plight to public places of riot and debauchery, we conſume and dry up our daily crudities in bagnio's; and, by ſweating out the moiſture of our bodies, we endeavour to procure an appetite for drinking; and ſpend the nights in libidinous gratifications and drunkenneſs, and the days in gaming, or ſleeping; and account ourſelves happy, becauſe we neither ſee the riſing nor the ſetting of the ſun. Therefore the conſequence of this idle and ſlothful way of living is *bad health*: for thus the bodies of young men are ſo unbraced, relaxed, and enfeebled, that *death* will not ſeem to make any alteration or change in them.

But, verily, that true and genuine progeny of *Romulus*, being conſtantly exerciſed in, and inured to hunting, and no leſs to country buſineſs and labour, excelled in, and were highly eſteemed for their exceeding great ſtrength and firmneſs of body; and, when the ſervice of their country required it, in time of war, they eaſily ſupported the fatigues of a military life, being hardened by their laborious exerciſes in times of peace; and they always preferred the country commonalty, to that of the city. For, as they, who ſtill kept within the incloſures of the manor-houſe, were accounted more ſlothful and faint-hearted, than thoſe who laboured the ground without doors; ſo they who ſauntered, and ſpent their time idly within the walls, under the ſhade of the city, were looked upon as more lazy and unactive, than thoſe who cultivated the fields, and managed buſineſs relating to Huſbandry. It is alſo evident, that their ninth-day Fairs or Markets (12), where they aſſembled themſelves together, were eſtabliſhed, and kept up, for this very purpoſe, that city affairs might be tranſacted every ninth day only, and rural affairs on the other days. For, in thoſe times, as we ſaid before, the people of quality, and principal men of the city, lived in the country, upon their own lands; and when their advice about public affairs was wanted, they were ſent for from their villas, to attend the Senate; from which thing, they who were ſent to ſummon them were called *viatores* (13); and while this cuſtom was obſerved, and kept up,

(12) There was a Fair or Market at *Rome* every ninth day, for the country people to meet and ſell their goods, and tranſact other buſineſs in town; ſo that their *Nundinæ* were not idle days, but appointed for buſineſs.

(13) *Viatores:* It ſeems by their firſt inſtitution they were to be ſent by the Senate to the country, to ſummon ſuch as lived there, to attend the public ſervice, and to conduct them to town: afterwards they were a ſort of Beadles, or Sergeants, who went before the Tribunes of the people, and ſome other officers of leſſer dignity.

by a moſt perſevering deſire of cultivating their lands, thoſe antient *Sabines* (14), who became citizens of *Rome*; and our old *Roman* anceſtors, tho' expoſed on every hand to fire and ſword, and to have their corns, and other fruits of the ground, waſted by hoſtile incurſions, notwithſtanding, laid up greater ſtore of them, than we, who, by the permiſſion of a long-continued peace, have had it in our power to inlarge and improve our Huſbandry.

Therefore things are now come to ſuch a paſs, that in this *Latium* (15) and country where *Saturn* lived, where the gods taught their own children the art of cultivating the ground; even there we let, by public auction (16), the importation of corn from our provinces beyond ſea, that we may not be expoſed to a famine; and we lay in our ſtores of fruits and wines from the *Cyclad* iſlands (17), and from the regions of *Bætica* (18) and *Gaul*. Nor is it any wonder, ſeeing the vulgar opinion is now publicly entertained and eſtabliſhed, that Huſbandry is a ſordid employment; and that it is a buſineſs

(14) The *Sabines* were a people of *Italy*, not far from *Rome*; they occupied the country that lies between *Umbria*, *Hetruria*, and *Latium*; between the rivers *Anien*, *Tiber*, *Nar*, and *Velino*: A great part of that country ſtill retains its antient name. By a peace concluded with the *Romans*, the two people became united, and many of the chief *Sabine* families removed to *Rome*.

(15) *Latium*, a country of *Italy*, a great part of it now called *Campagna di Roma*: here *Saturn* retired, and concealed himſelf, when he was driven out of *Crete*, by his ſon *Jupiter*. And here, probably, *Saturn* afterwards reigned, as in ſome other contiguous parts, which from him were called *Terra Saturnia*.

(16) *Locamus ad haſtam*. A ſpear was a ſign and badge of power and authority amongſt the antients, and uſed upon ſeveral occaſions; and at all auctions public and private, it was ſet up to ſignify, that they were done by a lawful commiſſion. *Ad haſtam & ſub haſta vendere, locare*, ſignify the ſame thing. When *Rome* became exceeding populous, they were obliged to import corn and wine from foreign parts; and tho' at firſt, probably, it was imported at the public charge, yet, afterwards, when the public advantage was not ſo much regarded, as the raiſing of money for ſupporting the power of the Emperors, certain undertakers paid a certain ſum for liberty to import it, and ſell it at a certain price, as may be gathered from *Suetonius* and others. The provinces commonly paid a certain quantity of corn, among other things, as a tribute, *viz.* the tenth part of their crop; and ſometimes they were obliged to furniſh a certain quantity of corn, at ſuch a price as the Government thought fit: all this was to be brought to *Rome* at a great expence, for which there would not have been a very great demand, if they had cultivated their lands as they did formerly.

(17) *Cyclades*, iſlands in the *Ægean* ſea, ſo called, as *Pliny* ſays in his *Nat. Hiſt. lib.* 4. *cap.* 12. from their lying round *Delos* in a circular figure: they are, according to him, fifty in number: He there gives an account of their extent, and diſtances from each other: they are now called *the Iſlands of the* Archipelago.

(18) *Bætica*, a part of *Spain*, containing *Andaluſia*, and a great part of *Grenada*: it is the fertileſt part of all *Spain*: it has its name from the river *Bætis*, which runs thro' the middle of it. *Pliny* ſays, that it excelled all other countries in the richneſs of its ſoil, goodneſs of its culture, and in a certain gaiety and agreeableneſs peculiar to itſelf. This river is now called the *Guadalquivir*.

which

which does not want the inſtruction of a maſter. But as for myſelf, when I conſider and review, either the greatneſs of the whole thing, reſembling ſome vaſtly extended body; or the number of its parts, as ſo many members in particular; I am afraid, leſt my laſt day ſhould ſurpriſe me, before I can acquaint myſelf with the whole of rural diſcipline.

For he that would profeſs himſelf to be perfect in this ſcience, muſt be exceedingly well acquainted with the nature of things; muſt not be ignorant of the ſeveral latitudes of the world; that he may be ſure of what is agreeable, or what is repugnant, to every climate; that he may perfectly remember the time of the riſing and ſetting of the ſtars, that he may not begin his works when winds and rains are coming upon him, and ſo fruſtrate his labour. Let him conſider the temperature and conſtitution of the weather, and of the preſent year; for neither do they, as it were by a ſettled law, always wear the ſame dreſs; nor does the Summer or Winter come every year with the ſame countenance: nor is the Spring always rainy, nor the Autumn moiſt: which I cannot believe any man can know beforehand, without an enlightened mind, and without the moſt excellent arts and ſciences.

Now very few have the talent to diſcern the great variety itſelf of the ground, and the nature and diſpoſition of every ſoil, what each of them may promiſe or deny us. Yea, when has any one man whatſoever had the opportunity to contemplate all the parts of this art, ſo as throughly to underſtand the uſe, advantage, and management of all ſorts of corns, and of tillage, and the various and different ſorts of earth, moſt unlike to one another? of which, ſome deceive us by their colour, ſome by their quality: and, in ſome countries, the black earth, which they call brown, or duſky, deſerves to be commended; in others, that which is fat, and red-coloured, anſwers better: in ſome countries, as in *Numidia* in *Africa*, the rotten ſands ſurpaſs, in fruitfulneſs, the ſtrongeſt ſoil whatſoever; in *Aſia* and *Myſia* (19), thick glutinous earth produces the greateſt abundance of any. And in theſe very ſorts, who is it that knows throughly what a hilly ſituation may refuſe, and by his reaſon finds out alſo what a low plain ſituation, what land that is cultivated, what woody land, what moiſt and graſſy land, what dry and dirty, will either

(19) *Myſia*, a country in *Leſſer Aſia*, extending moſtly weſtward, towards the *Helleſpont*. It was divided formerly into the Leſſer and Greater. Both parts are now called *Natolia*, ſubject to the *Turks*.

yield or refuſe? And *who is it that throughly knows every thing that is requiſite* in planting and preſerving trees and vineyards, of which there are innumerable kinds; and in purchaſing, breeding, and keeping all ſorts of cattle; ſince we have alſo taken in this as a part of Huſbandry; whereas the Graſier's knowledge and ſkill is diſtinct and ſeparate from the art of Huſbandry? Nor is this paſtoral knowledge of one ſort only; for horſe-cattle requires a way of management very different from that of herds of oxen; and ſheep-cattle different from theſe; and even in this kind itſelf, the *Tarentinian* (20), requires a different method from that which has coarſe and hairy wool. The goat-kind requires a different treatment, and in this kind itſelf, that which wants horns, and is thin of hair, is treated otherwiſe than that which has horns, and rough-briſtly hair, ſuch as we ſee in *Cilicia* (21).

Moreover, the buſineſs of a hog- or pig-feeder is different from that of a ſwineherd, and they have different ways of feeding: nor do the ſmooth-coated ſwine, that have no hair upon them, and ſuch as are thick of hair, require the ſame climate, or delight in the ſame ſtate of weather; nor are they to be managed and brought up after the ſame manner. But not to inſiſt any more at preſent upon the different ſorts of cattle, under which denomination, and as a part of which, the management of poultry, and of bees, is placed; and what man has extended his ſtudy ſo far, as to know, beſides the things I have already reckoned up, the ſo many different ſorts of ingraftings; the ſo many different ways of pruning; and to put in practice the culture of ſo many different ſorts of apple-trees, and of pot-herbs, and of ſo many different ſorts of fig-trees, ſo as to beſtow his care upon Roſeries alſo, when even greater things are neglected by moſt people? altho' even theſe things have now begun to bring in no ſmall revenue to many. For meadow-lands, willow-grounds, brooms and reeds, tho' they require but ſmall care and induſtry, yet they always require ſome.

(20) *Tarentum*, in the kingdom of *Naples*, anciently a very famous city, commodiouſly ſituated in the entry to the *Adriatic*. *Florus* ſays it was built by the *Lacedæmonians*; it was once the head of all *Calabria*, *Apulia*, and *Lucania*: it was ſo powerful as to make war with the *Romans*, with the aſſiſtance of *Pyrrhus*, and many other people, at firſt with great ſucceſs; but at length was intirely defeated and ſubdued.

(21) *Cilicia*, a very well-known country in *Aſia Minor*, bordering on *Syria* on the eaſt, *Pamphylia* on the weſt, mount *Taurus* on the north, and the *Cilician* ſea on the ſouth. It is now called *Caramania*, and ſubject to the *Turks*.

After

After this enumeration of ſo many and various things, I am not ignorant, that if, from ſuch as concern themſelves with affairs of Huſbandry, I ſhall require all the qualifications of the Huſbandman we ſeek for and deſcribe, ſuch as learn, will go on very ſlowly in their ſtudies; who, being terrified thro' deſpair of ever attaining to a ſcience of ſo vaſt an extent and variety, will not attempt what they have no hopes of being able to obtain. Nevertheleſs, as *Marcus Tullius* has already ſaid very rightly, in his book *de Oratore* (22), *That it is fit, that they who have an earneſt deſire diligently to ſearch after, and put together, things the moſt uſeful to mankind, and after they have carefully weighed and conſidered them, to publiſh them to the world, ſhould try all things.* Nor, if either that ſtrength and excellency of genius, or the furniture, help, and aſſiſtance of the celebrated arts be wanting, ought we preſently to ſink into idleneſs and ſloth, but proſecute with perſeverance what we have prudently hoped for. For affecting to be at the very top of our profeſſion, it will be honour enough for us, if we be ſeen in the ſecond rank. Did not the *Latian* muſes receive not *Accius* (23) and *Virgil* only (24), into the moſt ſecret receſſes of their temple, but beſtowed the ſacred ſeats alſo upon them that were next to them; and even upon them that were far from being next to them? Neither did *Cicero*'s eloquence (25), which, like lightning, bore down every thing in its way, deter *Brutus* and *Cælius*, *Pollio*, *Meſſala*, and *Catullus* (26), from proſecuting the ſame

(22) Our author expreſſes the ſenſe, not the very words, of *Tully*, *cap.* 1. *de Orat.*

(23) *Accius*, a famous tragedian; he flouriſhed in the 615th year of *Rome*. *Quintilian*, *lib.* 10. ſays, that he and *Pacuvius* were in the higheſt reputation, for the gravity of their ſentences, the weight of their words, and authority of their perſonages.

(24) *Virgil*, of all poets, either among the *Greeks* or *Romans*, deſervedly reckoned next to *Homer* himſelf. He was in great favour with *Auguſtus*, who ſaved his divine *Æneid*, as he called it, from the flames; he having at his death deſired it might be burnt. *Pliny* calls him *Lux doctrinarum altera*, alluding to *Homer*, whom he calls *Fons ingeniorum*.

(25) *Cicero*, the greateſt maſter of eloquence, that ever *Rome* produced; juſtly admired in his own time, and in all ages ever ſince; and muſt always be, as long as men have any taſte for learning. He was called, not only the Father of *Roman* eloquence, but the Father of his country, the great aſſertor of its liberty, which he had often ſaved, and at laſt died a victim to it, having been murdered by order of *Marc Antony*, whoſe uſurpations he had courageouſly withſtood. He is ſo well known, and his character ſo well deſcribed by many authors, and eſpecially his life ſo elegantly written by the learned Dr. *Middleton*, that it is ſuperfluous to ſay any thing here of ſo great a man.

(26) *Brutus*, &c. Theſe were five famous orators, cotemporary with *Tully*. *Brutus* was one of the conſpirators againſt *Julius Cæſar*, and, with *Caſſius*, endeavoured to reſtore the republic. We have an oration of *Cicero*'s, for this *Cælius*. *Aſinius Pollio* wrote an hiſtory of the civil wars, *Horat. lib.* 2. *Ode* 1. *Priſcian* quotes his annals in ſeveral places. *Suetonius in Aug.* often mentions him. *Virgil* inſcribed an eclogue to him. We have a letter of his to *Tully*, *lib.* 10. *ad fam.*

ſtudy. For neither did the renowned *Cicero* himſelf, by being terrified with *Demoſthenes* (27) and *Plato*'s (28) thunder, give over his purſuit: nor did the divine *Homer* (29), the father of eloquence, with his mighty floods of eloquence, extinguiſh the deſires and ſtudies of them that came after him. Do we ſee, that thoſe artiſts of leſſer reputation indeed, who, for many ages paſt, were admirers of *Protogenes* (30), *Apelles* (31), and *Parrhaſius* (32), did abandon and give over their labour? Nor were *Bryaxis* (33), *Lyſippus* (34), *Praxiteles* (35), or *Polycletus*, of the following age, ſo aſtoniſhed at the beauty of *Jupiter Olympius*, and of *Minerva*, by *Phidias* (36), that they had not the courage to try what they could perform, or what length they could come themſelves. But, in every kind of ſcience, they who excel

(27) *Demoſthenes*, a famous orator of *Athens*; he was a hearer of *Plato*. *Quintilian* ſays of him, *Pene lex ipſe dicendi fuit*, The law or ſtandard of eloquence.

(28) *Plato*, a renowned philoſopher, and a very eloquent orator of *Athens*, ſcholar to *Socrates*. He was not content with the knowledge he acquired in his own country, but travelled into *Egypt*, to acquaint himſelf with the learning of the prieſts of that country; and into *Italy*, to converſe with the *Pythagorean* philoſophers. He flouriſhed in the 98th Olympiad. His life is written by *Marcilius Ficinus*.

(29) *Homer*, the prince of poets, and *Fons ingeniorum*, as *Pliny* ſtiles him, lived about 2700 years ago. *Pliny*, *Hiſt. Nat. lib.* 7. *cap.* 16. ſays, that he lived about 1000 years before he wrote, which was in the reign of the emperor *Veſpaſian*. It ſeems, his admirers placed him among their gods: for we read of a temple he had at *Smyrna*: and our author calls him, *Deus ille Mæonius*. They ſay, his father's name was *Mæon*, from which he is ſometimes called *Mæonius*.

(30) *Protogenes*, a famous painter. He lived in *Rhodes*, was cotemporary with *Apelles*, and yielded to none but him.

(31) *Apelles*, the prince of painters, lived in the time of *Alexander* the Great, who would be painted by none but him. He was of the Iſland of *Coos*, and flouriſhed in the 112th Olympiad.

(32) *Parrhaſius*, as *Athenæus* ſays, *lib.* 12. was born at *Epheſus*. The *Athenians* made him free of their city. *Pliny* is very copious in the deſcription and commendation of their beſt pieces, which were moſtly purchaſed in *Greece*, and brought to *Rome*.

(33) *Bryaxis*, a famous *Athenian* ſtatuary, as *Pauſanias* ſays, *lib.* 1. *Attic.* He was employed by *Artemiſia*, in building a tomb or monument to the memory of her husband *Mauſolus*, king of *Caria*, who died about the 106th Olympiad. This tomb was reckoned the moſt perfect of its kind in the whole world.

(34) *Lyſippus*, a famous engraver and ſtatuary, in the time of *Alexander* the Great; who, as he would not ſuffer any to paint him but *Apelles*, ſo none to engrave him but *Lyſippus*. *Pliny*, *Hiſt. Nat. lib.* 34. *cap.* 7. ſays, he finiſhed 1500 pieces, all ſo artfully wrought, that any one of them might have made him famous. He was a *Sicyonian*, and flouriſhed in the 114th Olympiad.

(35) *Praxiteles* and *Euphranor*, both flouriſhed in the 104th Olympiad; and *Polycletus* the *Sicyonian*, in the 87th Olympiad, according to *Pliny*.

(36) *Phidias*, a famous ſculptor. He flouriſhed in the 84th Olympiad, about the 300th year of *Rome*. He made a ſtatue of *Jupiter Olympius*, of ivory and gold, which none ever attempted to emulate; and one of *Minerva*, which, for its exquiſite workmanſhip, was called The *Beauty*, καλλίμορφος, or καλλίστη. *Plin. lib.* 34. *cap.* 8.

are

are admired and reverenced, and they who are of a lower claſs meet with their deſerved praiſe. 'Tis the very caſe here: What, ſuppoſe the perſon, whom we deſire to make a complete Huſbandman of, has not attained to the perfection of his art, nor to the ſagacity and knowledge of *Democritus* (37), or *Pythagoras* (38), in univerſal nature; or to the foreſight of *Meton* (39), or *Eudoxus* (40), from their knowledge of the motions of the ſtars and winds; nor to the learning of *Chiron* (41) and *Melampus* (42), in the management of cattle; nor to the prudence and ſkill of *Triptolemus* (43) and *Ariſteus* (44), in tilling and cultivating the ground? Nevertheleſs, he will have made great proficiency, if he be equal to our *Tremellius's*, *Saſerna's*, and *Stolo's* (45): for Agriculture is capable of being managed, neither with too much delicacy and niceneſs; nor, on the other hand, in a groſs and bungling manner: for that is far from being true, which moſt

(37) *Democritus*, a famous philoſopher of *Abdera*, a city of *Thracia*. He travelled over a great part of the world in queſt of knowledge; he was a hearer of *Socrates*, and a patient of *Hippocrates*, who declared he was of a ſound mind, when his friends imagined he was mad. He wrote of husbandry, and flouriſhed in the 80th Olympiad. *Diogenes Laertius* gives an account of his life and writings.

(38) *Pythagoras*, a very famous philoſopher of *Samos*. After he had travelled into *Chaldea* and *Egypt*, he came into *Italy*, and taught philoſophy in that part of it called *Magna Græcia*, where he had a vaſt number of ſcholars, who made a great figure afterwards in the world. He was a man of ſuch excellent morals, that he contributed much to reform that, and other countries, from their ſavage and wicked diſpoſition and manners. *Diogenes Laertius* ſays, that he flouriſhed in the 60th Olympiad.

(39) *Meton*, a very antient philoſopher; he firſt publiſhed at *Athens* his ἐννεακαιδεκαετηρίδα, or cycle of the moon, of 19 years. See *Diodor. Siculus*, *lib.* 12. and *Petavii Uranologia*.

(40) *Eudoxus*, a very famous aſtronomer of *Cnidus*. He flouriſhed in the 96th Olympiad, and was a hearer of *Plato*. *Laertius* gives an account of his writings.

(41) *Chiron*, a famous aſtronomer and phyſician, of *Theſſaly*: *Æſculapius* was his ſcholar. *Pindar. Pyth. Ode* 3. He was tutor to *Achilles*, and the inventor of phyſic.

(42) *Melampus*, a famous diviner and phyſician of *Argos*. *Homer*, *Statius*, and others celebrate him. *Pliny* frequently mentions him, and ſays, *lib.* 27. *cap.* 5. that one kind of Ellebore is from him called *Melampodion*.

(43) *Triptolemus*, the inventor of the plough, and of Husbandry, according to *Servius*, *Virg. Georg. lib.* 1. *cap.* 163. He was the ſon of *Celeus*, who reigned in *Eleuſin* in *Attica*. *Ceres* taught him the art of Husbandry. *Vide Hyg. Fab.*

(44) *Ariſteus*, by *Pliny* and *Diodorus*, is ſaid to be the inventor of honey and oil. *Vide Juſt. lib.* 14.

(45) *Tremellius*, father and ſon, *Saſerna*, *Stolo*, famous Husbandmen, or writers upon Husbandry, many years before *Columella*. Their writings are loſt, but what was valuable in them we have in our author.

This *Stolo*, probably, is the ſame, who, having made a law, that no citizen ſhould purchaſe above 500 *jugera* of land, was condemned by his own law, having purchaſed 500 *jugera* in his ſon's name, *Val. Max. lib.* 8. *cap.* 6. *Varro de re ruſtica*, *lib.* 1. *cap.* 2. Perhaps he is the ſame, who firſt invented *pampination*, or cutting off the ſuckers and other ſuperfluous branches of vines, *&c.* and was therefore called *Licinius Stolo*. *Stolo* ſignifies a ſucker.

people

people have believed, that Huſbandry is exceeding eaſy, and requires no great penetration or ſharpneſs of wit. There is no occaſion, at preſent, to diſcourſe more of it in general, foraſmuch as I am reſolved to explain it, in all its parts, in ſome diſtinct books, ſeparately; which I ſhall proſecute each in its own order, after I ſhall have ſpoken firſt of ſuch things, as I think do principally belong to the whole diſcipline in general.

CHAP. I.

Of the Rules which they, who would live in the Country, and apply themſelves to Huſbandry, ought to follow.

LET him, who applies himſelf to the ſtudy of Huſbandry, know, that thoſe principal things following, and of the greateſt importance, muſt be called to his aſſiſtance: *Prudence and knowledge of his buſineſs; ability to ſpend and lay out money upon it; and a willingneſs to act.* For, after all, as *Tremellius* ſays, He will have the beſt cultivated lands, who both knows how to cultivate them, is able to do it, and has alſo a willing mind. For, neither *knowing* nor *willing* can be of any uſe to any perſon whatſoever, without thoſe expences which the buſineſs requires: nor, on the other hand, can *a willingneſs to do, and to lay out money*, be of any advantage, without art; for 'tis the principal point in all buſineſs, *to know what muſt be done*, eſpecially in Huſbandry; in which the *will*, and the *ability* to ſupport the expences, without knowledge, frequently bring loſſes upon the landlords; ſince works, imprudently done, render all expences ineffectual. Wherefore a diligent maſter of a family, who has it at heart to follow a ſure method of increaſing his ſubſtance, by the culture of his land, ought, above all things, to be careful to adviſe with, and conſult the wiſeſt Huſbandmen of his own time, upon every thing; and ſearch diligently the hiſtories and writings of the antients; and to conſider the opinions, precepts, and directions of every one of them; and examine whether all the things, which the antients have left us, upon record, are agreeable to the Huſbandry of this preſent time; or if ſome things are not diſagreeable to it.

For I have found, that, formerly, many memorable authors were fully perſuaded, that by the long continuance of things in the ſame ſtate, the quality and conſtitution of the heavens, and of the air, are changed; and

and that *Hipparchus* (1), the wiſeſt profeſſor of aſtronomy among them, has left it us in writing, that the time would come, when the poles of the world ſhould be moved out of their place; and *Saſerna*, no contemptible author of Huſbandry, ſeems to have believed this alſo. For in that book of Huſbandry which he wrote, and left behind him, he brings this argument to prove, that the conſtitution of the heaven is altered; *viz.* that thoſe countries wherein formerly no plants, either of vines or of olives, which they ſet in the ground, could be preſerved, becauſe of the continual violence and ſeverity of the winter, have now plentiful vintages, and abound both in wine and in oil; the former cold being now much abated, and the weather become mild and warm. But whether this reaſon be true or falſe, let us yield it to aſtronomical learning. But as to the other precepts and rules of Huſbandry, we muſt not diſſemble with the Huſbandman, nor conceal from him, that whereas the *Carthaginian* writers from *Africa* have delivered to us very many things relating to the ſame, yet our Huſbandmen find fault with many things they have written; and ſhew us, that they are falſe. As *Tremellius*, for example, who, complaining of this very thing, notwithſtanding, excuſes it, becauſe the ſoil, air, and climate, of *Italy* and *Africa*, being of a different nature, cannot produce the ſame increaſe, or yield the ſame plenty.

But whatever thoſe things be, which, becauſe of the rural diſcipline of our times, are not agreeable to the opinion or practice of the antients, they ought not to deter the learner from reading. For, with the antients, there are many more things which deſerve to be commended and approved by us, than to be rejected. Moreover, there is a great multitude of *Greeks*, who lay down rules and precepts for Huſbandry; of whom the chief, that moſt celebrated poet, *Heſiod* the *Bæotian* (2) has contributed not a little to our profeſſion. Afterwards, *Democritus* the *Abderite*, *Xenophon* (3) a follower of *Socrates*,

(1) *Hipparchus*, a very famous aſtronomer, of *Nice*, in *Bithynia*. He flouriſhed in the 154th Olympiad. *Pliny* ſays, *lib.* 2. *cap.* 13. that he lived about two hundred years before his time.

(2) *Heſiod*, a very antient poet. Some ſay he was of *Cuma* in *Æolis*, and afterwards removed to *Aſcra* a city in *Bœotia*, and hence called the *Aſcrean Bard*. Some ſay, he lived before *Homer*; others ſay, after. *Vide Aul. Gell. lib.* 17. *cap.* 21. *Pliny* ſays, his book of Husbandry was loſt in his time, and that he was the firſt who gave precepts upon that ſubject.

(3) *Xenophon*, a great admirer and follower of *Socrates*, as we ſee, by his *Memorabilia Socratis*, among his other works. He was both a great Captain, and a great Philoſopher. His life is written by *Laertius*. He was in great reputation in the 95th Olympiad.

Architas

Architas (4) the *Tarentinian*, and thoſe two Peripatetics, the maſter and the ſcholar, *Ariſtotle* and *Theophraſtus* (5), who all ſprung from the fountains of wiſdom, gave further aſſiſtance to it.

The *Sicilians* alſo have proſecuted this buſineſs with no ordinary care, *Hieron* (6), and *Epicharmus* his ſcholar (7), *Philometor*, and *Attalus* (8). *Athens* alſo has produced a great number of writers, of which the moſt approved authors are *Chæreas*, *Ariſtandros*, *Amphilochus*, *Euphron*; *Chreſtus* the ſon of *Euphron*, not, as many think, the *Amphipolitan*, who himſelf is alſo eſteemed an excellent Huſbandman, but he, who was a native of *Attica*.

The Iſlands alſo greatly cultivated this ſtudy, and had it in great eſtimation; as witneſs *Epigenes* of *Rhodes*, *Agathocles* of *Scio*, *Euagon* and *Anaxipolis* of *Thaſus*. *Menander* and *Diodorus* alſo, who were of the ſame country with *Bias*, one of the ſeven wiſe men, laid claim, among the firſt, to the knowledge of Agriculture. Nor did *Bacchius* and *Mnaſſeas* of *Mileſium*, *Antigonus* of *Cyme* (9), *Apollonius* of *Pergamus* (10), *Dion* of *Colophon*, *Hegeſias* of *Marogna* (11), yield to theſe. For, indeed, *Diophanes* the *Bithynian* (12) abridged, and reduced into ſix books, the intire works of *Dionyſius* of *Utica*, who, in many volumes, had, in a very diffuſe manner, interpreted

(4) *Architas*, a great *Pythagorean* philoſopher, of *Tarentum*. He taught *Plato* Geometry, who was born in the 4th year of the 88th *Olympiad*.

(5) *Ariſtotle* and *Theophraſtus*, two well-known philoſophers: The firſt was a hearer of *Plato*, when eighteen years of age, in the hundred and fifth Olympiad. The ſecond flouriſhed in the hundred and fourteenth Olympiad, and had his name from his divine eloquence, *a divinitate loquendi*, as *Cicero* ſays.

(6) *Hiero*, or *Hieron*, was King of *Sicily*, a Prince of very great note: he reigned at *Syracuſe* in the ſeventy-fifth Olympiad. See *Val. Max. lib.* viii. *c.* 13. *Pindar* dedicates ſome of his odes to him.

(7) *Epicharmus* was of *Syracuſe*, a great philoſopher, and a poet, called *Siculus vates* by *Horace*, *lib.* ii. *ep.* 1. a hearer of *Pythagoras*, he wrote carefully of medicines proper for cattle, ſays our author, *lib.* x.

(8) *Philometor* and *Attalus*. Our author makes them *Sicilians*, and two diſtinct perſons; but *Varro*, *lib.* i. c. 1. ſeems to ſay, that *Philometor* was only the ſurname of *Attalus*, he being ſo called from his dutifulneſs to his mother. We read of one *Attalus*, King of *Pergamus*, who had the honour of being called *amicus populi Romani*, the friend of the *Roman* people, to whom he left his Kingdom. Probably he is the ſame; for he wrote ſeveral curious pieces, ſome of which, probably, were upon Husbandry.

(9) *Antigonus* was of *Cyme* in *Æolis*, therefore called *Cymæus*.

(10) *Apollonius Pergamenus*. The ſcholiaſt upon *Nicander* quotes him.

(11) *Hegeſias* of *Maronea*, or *Marogna*, as it is now called, a city in *Thrace*, *Vitruvius*, *lib.* viii. c. 4. as having, with infinite ſtudy and care, explained the properties of places, and the virtues of waters.

(12) *Diophanes*; *Varro* calls him a *Nicean*, from *Nice*, a city in *Bithynia*. He dedicated his Abridgment of *Dionyſius* of *Utica* to King *Deiotarus*, *Varro*, *lib.* i. *c.* 1. *Suidas* ſays, that *Aſinius Pollio* epitomized them alſo in four books.

Mago

Mago the *Carthaginian*, and other, notwithſtanding more obſcure authors, whoſe countries we have not been informed of, have contributed ſomething to our ſtudy: They are thoſe following: *Androtion*, *Æſchrion*, *Ariſtomenes*, *Athenagoras*, *Crates*, *Dadis*, *Dionyſius*, *Euphyton*, *Euphorion* (13). Nor with leſs fidelity have *Lyſimachus* and *Cleobulus*, *Meneſtratus*, *Pleutiphanes*, *Perſis*, *Theophilus*, to the utmoſt of their power, brought in tribute to us.

And that we may now at length beſtow the freedom of the city of *Rome* upon Huſbandry, (for as yet, by theſe authors, ſhe was only of the *Greek* nation) let us now make mention of the famous *Marcus Cato* the *Cenſor* (14), who taught her firſt to ſpeak *Latin*; after him, of the two *Saſerna's* (15), the father and ſon, who inſtructed her more carefully; and, next, of *Scroſa Tremellius* (16), who made it eloquent; and of *Marcus Terentius* (17), who exactly poliſhed and perfected her; and afterwards, of *Virgil*, who made her alſo mighty and powerful in verſe. Nor, laſtly, let us think it below us, to make mention of *Hyginus* (18), who was, as it were, a Pedagogue to her. Nevertheleſs,

(13) *Androtion*, &c. *Varro* ſays of all theſe, that he had not found what country they were of: ſo it is needleſs to trouble the reader any farther about them, ſeeing nothing certain can be ſaid of them, moſt of their writings being now loſt: only we may obſerve how numerous the writings upon this ſubject were, and how praiſeworthy it was of old reckoned, to have contributed never ſo little to the improvement of it.

(14) *Cato* the *Cenſor*, a man of great reputation for learning and wiſdom. *Pliny*, in his *Nat. Hiſt.* ſays, he was famous for his triumph and cenſorſhip, but much more for his learning, and the precepts he gave to mankind concerning every thing that might be the object of their deſire, eſpecially agriculture, being, by the confeſſion of the age he lived in, the beſt Husbandman; and that there was nobody that pretended to equal him. He was called *Cenſorius*, for the remarkable ſeverity wherewith he exerciſed his office of Cenſor. His whole life was a cenſure of the follies and faults of his fellow-citizens. He died, as *Pliny* ſays, the very year when *Carthage* and *Corinth* were taken, in the 106th year of *Rome*. *Pliny* wrote about two hundred and thirty years after him. He was an excellent general, an excellent orator, and an excellent ſenator. See his character elegantly deſcribed by *Liv. Dec.* 4. *Lib.* ix. His book of husbandry is ſtill extant.

(15) *Saſerna*, father and ſon. *Pliny* ſays, that they were the moſt antient, and the moſt celebrated Husbandmen after *Cato*. *Marcus Terentius Varro* frequently quotes them. They were of the *Hoſtilian* family.

(16) *Tremellius Scroſa* was cotemporary with *Varro*, *lib.* i. *c.* i. who ſays of him, *Cui hæc ætas defert rerum omnium ruſticarum palmam*, All owned his ſuperior knowledge in Huſbandry. He was a General alſo, and commanded an army upon the *Rhine*.

(17) *Marcus Terentius Varro*, much celebrated by *Tully*, *Pliny*, and others, as the moſt learned man amongſt the *Romans*. Beſides his books *de re ruſtica*, and *de lingua Latina*, which, though incorrect, are ſtill extant, he wrote many books of antiquities, and of ſeveral other ſubjects, which are all loſt: He was born about the ſix hundred and thirty-ſeventh year of *Rome*, was cotemporary with *Pompey*, *Cæſar*, &c.

(18) *Caius Julius Hyginus* was a native of *Spain*, and the Emperor *Auguſtus's* freedman, and keeper of his library; a great intimate of *Ovid* the poet. Some ſay he was of *Alexandria*, and brought by *Cæſar* to *Rome* after the taking of that city. He wrote ſeveral

theleſs, above all, let us pay the greateſt veneration and reſpect to *Mago* the *Carthaginian* (19), the father of Huſbandry. For thoſe twenty-eight memorable volumes of his were, by a decree of the ſenate, tranſlated into the *Latin* tongue. Nevertheleſs, men of our own times, *Cornelius Celſus* (20), and *Julius Atticus* (21), have deſerved no leſs Commendation. For *Cornelius* compriſed the whole body of this art in five books, and *Julius Atticus* publiſhed one ſingle book, of one ſpecies of culture relating to vines; whoſe diſciple, as it were, *Julius Græcinus* (22), took care, that two volumes of the like precepts, concerning vineyards, which he had compoſed in a more facetious and learned ſtyle, ſhould be tranſmitted to poſterity.

Theſe, therefore, O *Publius Silvinus*, call to council, and adviſe with them, before you make any contract with Huſbandry. Nevertheleſs, be not of ſuch a diſpoſition of mind, as to think, that, by their opinions, you will obtain the whole of the thing you deſire: for the records, or memorials, which ſuch writers have left, rather inſtruct, than make an artiſt. In arts, *uſe* and *experience* are maſters, and bear the ſway: nor is there any art whatſoever, where one may not learn by committing miſtakes. For, when any thing, by wrong management, has turned out unſucceſsfully, we avoid that which has formerly deceived us: and the inſtructions of a teacher caſt a light upon the right way. Therefore, the rules and precepts we lay down, do not promiſe to bring this ſcience to perfection, but to lend it a helping hand; nor

books, which are loſt; his *aſtronomicum poeticum* is ſtill extant. Our author commends him highly in ſeveral places, particularly in his ninth book, *cap.* 2.

(19) *Mago*, whom our author calls the *Parent* of Husbandry, wrote twenty-eight books on this ſubject in the *Carthaginian* language. *Dionyſius* of *Utica* tranſlated them into *Greek*, and ſent them to the prætor *Sextilius*. He was a great captain; and the *Roman* ſenate, after the taking of *Carthage*, paid ſo great honour to him, that they ordered his books to be tranſlated into *Latin*, and committed the work to ſuch as were moſt ſkilful in the *Carthaginian* language, *Pliny*, *Nat. Hiſt. lib.* xviii. *c.* 4. Where he ſays, that among foreign nations it was reputed a princely employment, to deliver precepts concerning the cultivation of the ground, as *Hieron*, *Archelaus*, *Xenophon*, *Mago*, and ſeveral others did.

(20) *Cornelius Celſus* flouriſhed in the time of the Emperor *Tiberius*. He was called the *Latin Hippocrates* for his great learning in phyſic. His books on that ſubject, ſtill extant, ſufficiently evidence his great ability in that learned profeſſion. *Quintilian* ſays, *lib.* xii. *c.* 11. that he not only gave precepts of eloquence and hiſtory, but alſo of the art of war and husbandry.

(21) *Julius Atticus* was cotemporary with *Columella*.

(22) *Julius Græcinus* was father to *Julius Agricola*, whoſe life we have, written by *Tacitus*. He was of the ſenatorian order; remarkable for his ſtudy of eloquence and wiſdom; and, by his virtues, drew upon himſelf the indignation of *Caligula*. *Seneca de beneficiis*, *lib.* ii. *c.* 21. has a very remarkable expreſſion: "*Julius Græcinus*, an excellent perſon, whom "*Caligula* ſlew for this very reaſon, becauſe he was a better man than it was expedient for "a tyrant any one ſhould be."

will

will any perſon, purely by having read over the rules we have preſcribed, become an adept in Agriculture, unleſs he have both a willing mind, and a heavy purſe to put them in practice: wherefore we promiſe, that they will be as helps only to ſuch as ſtudy this art; but will be of no uſe by themſelves, but in conjunction with other things. Nor, indeed, will either theſe aſſiſtances, as we ſaid before, nor conſtant labour, the experience of the Bailiff, nor plenty of money, and a heart to lay it out, have ſo powerful an influence, as the maſter's own preſence alone; for unleſs he himſelf come often, when leaſt looked for, while buſineſs is doing, as in an army, when the general is abſent, all buſineſs is at a ſtand, and duty is neglected. And I verily believe, that *Mago* the *Carthaginian* pointed out this to us, by beginning his writings with ſuch ſentences as thoſe: "Whoever has a mind to purchaſe land, let him ſell his houſe, leſt he rather chuſe to live in his "houſe in town, than in that in the country. He, who takes greater "delight in his houſe in town, will have no occaſion for a manor in "the country." Which precept, if it could be obſerved in theſe times, I would by no means change.

Now, foraſmuch as civil ambition often calls moſt of us from the country, and oftener detains us, when we are called from it; conſequently I think, that an eſtate near the city is moſt commodious, that ſo a man, how buſy ſoever he may be, may be able to make an excurſion every day, after the public buſineſs is over. For they, who purchaſe lands at a diſtance from town, not to ſpeak of thoſe beyond-ſea, yield up their eſtates to their ſervants, as if they were their heirs; and, which is worſe, they do it in their own life-time: for certain it is, that they are not only corrupted and debauched by their maſters being at ſo great a diſtance from them; but, being once corrupted, expecting that, after the flagitious actions they have committed, others will be ſent in their room, they apply themſelves more to plundering and rapine, than to Huſbandry.

CHAP. II.

Of the moſt approved ſituation and qualities of land.

THerefore I am of opinion, that land ought to be purchaſed near the *city*, where the owner may frequently come, and alſo give out, that he will come oftener than he really intends. For, under this

apprehenſion, the Bailiff and the ſervants will be in their duty; but, whenever he has an opportunity, let him ſtay in the country, and not paſs the time he ſtays there in idleneſs and eaſe, and lolling in the ſhade, or keeping within-doors. For it becomes a diligent maſter of a family, frequently to go round every corner and inch of his own land, and at all times of the year, that he may the more wiſely conſider the nature of the ſoil, either in the boughs and leaves of trees, or in the graſs and herbs, or in the fruits of the ground, when they are come to maturity; and not be ignorant of what is right and proper to be done in it: for that is an old ſaying, and of *Cato*, *That that land is ſcurvily uſed, whoſe owner does not teach nor direct what muſt be done, but hears his Bailiff* (1). Wherefore, let it be the chief care of one, who either poſſeſſes lands of inheritance from his anceſtors, or who is about to purchaſe them, to know, what kind of ground is moſt approved of, that he may either be without what is unprofitable, or purchaſe that which deſerves to be commended. And, if fortune ſhall favour and aſſiſt our deſires, we will have land in a wholſome air, a fertile and rich ſoil, partly champain, and partly on little hills, gently declining to the eaſt, or to the ſouth; with ſome parts of the ground cultivated, and other parts woody and rough; nor far from the ſea, or a navigable river, by which the fruits of it may be exported, and all ſorts of commodities imported.

Let the champain part, divided into meadows, and arable lands, willow- and reed-groves, lie below the houſe. Let ſome of the hills be void of trees, that they may ſerve for corn only, which nevertheleſs thrives better in moderately dry and fat champain lands, than on high and ſteep places. Therefore the higher corn-lands alſo ought to have ſome level parts, and be of a gentle and eaſy deſcent, and as like a champain ſituation, as poſſible. Then, let other of the hills be cloathed with olive-yards and vineyards, and copſes for producing props for ſupporting vines, and afford wood and ſtone, if neceſſity forces you to build; as well as paſture for cattle: and let ſprings of conſtantly-running water ſend down rivulets into the meadows, and gardens, and willow-groves: nor let there be wanting flocks and herds of great and ſmall cattle, and other ſorts of four-footed beaſts, feeding upon both the cultivated ground, and the thickets. But this ſituation, which we deſire, is difficult and rare to be found, and falls to the ſhare of very few. That ſituation is next to it, which has moſt

(1) This antient ſaying is not in *Cato* in ſo many words, as we now have him; only *let not the Bailiff think himſelf wiſer than his Maſter.*

of

of theſe qualities: and that is tolerable, which has not a very few of them.

CHAP. III.

Of ſuch things as are principally to be conſidered, in viewing and examining Land, before it be bought.

PORCIUS *Cato* (1), indeed, was of opinion, that there were two things chiefly to be conſidered, in examining and purchaſing of land, the *wholſomeneſs* of the *air*, and the *fruitfulneſs* of the *place*; of which if either the one or the other ſhould be wanting, and notwithſtanding any one ſhould have a mind to dwell there, he muſt have loſt his ſenſes, and ought to be conveyed to his kinsfolk, to *take care of him*. For no man in his ſenſes ought to lay out money in cultivating a barren ſoil: nor, on the other hand, can the owner of a peſtilentious, though very fertile and fat land, live to partake of the fruits thereof; for, where one muſt lay his account to be expoſed to certain danger, there, not only the reaping the fruits, but the life alſo of Huſbandmen, is dubious; or rather, death is more certain than getting money.

After theſe two principal things, he farther added thoſe following, as no leſs neceſſary to be examined and conſidered; *viz.* the *road*, the *water*, and the *neighbourhood*. A convenient road contributes much to the advantage of lands. The firſt advantage, which is the greateſt of all, is the owner's own preſence, who will come there the more willingly, if he is not afraid of being plagued with the badneſs of the road. The next is, the conveniency for importation and exportation of all ſorts of utenſils; which thing increaſes the value of ſuch fruits of the ground as we lay up in ſtore, and leſſens the charge of the things we bring home: for they may be carried, with leſs expence, to places, where one may come without much trouble or fatigue.

(1) *Porcius Cato* has not theſe very words, but the ſubſtance of them; and thoſe words, *ad cognatos & gentiles deducendum*, are taken out of *Varro*, and are agreeable to the law of the Twelve Tables, which deprived prodigals and madmen of the management of their eſtates; and by them the antients ſignified, that a man was mad, or had loſt his ſenſes. The *Roman* lawyers ſay, that the *agnati* were relations by the father's ſide, and that the *gentiles* were thoſe of both father and mother; and to them the commiſſion of lunacy, as we term it, was granted.

Nor

Nor is it of ſmall advantage to be carried cheap, if you make uſe of hired horſes when you travel, which is more expedient, than to keep horſes of your own. The ſervants alſo, who are to follow the maſter of the family, will not with reluctancy begin their journey on foot.

As to the goodneſs of the water, that is a thing ſo manifeſt to every body, that there is no occaſion to inlarge upon it; for who can have any doubt, but that that water is to be accounted the beſt, and the moſt approved, without which none of us can prolong his life, either in health, or in ſickneſs? As to the conveniency and advantage of a good neighbour, this is, indeed, what we cannot have any certainty of. Sometimes *death*, and divers other cauſes, common to him and us change him: and therefore ſome people reject *Cato*'s opinion, who nevertheleſs ſeem to be mightily miſtaken. For, as it becomes a wiſe man, with great courage and reſolution, to ſupport accidental misfortunes, ſo it is acting like a madman, for one to make a bad fortune for himſelf; which that man does, who, with his own money, purchaſes a wicked neighbour, ſince, from the very cradle, if he be deſcended of free-born parents, he might have heard, that *No man would loſe his ox, if neighbours were not naught* (2); which is ſpoken not only of an ox, but alſo of every other part of our eſtate: ſo that many have rather choſen to be without dwelling-houſes, and have fled from their own habitations, becauſe of the injuries of their neighbours: unleſs we think, that it was for ſome other reaſon, that whole nations have abandoned their native ſoil, and gone to a different part of the world, I mean the *Achæans* (3), the *Hiberians* (4), the *Albanians* (5), as did alſo the *Sicilians* (6); and, that I may touch upon our own original, the *Pelaſgians* (7), the *Aborigines* (8), the *Arcadians*;

(2) This line is taken out of *Heſiod*.

(3) Thoſe *Achæans* here mentioned ſeem to be a people of that name, who, *Pliny*, *lib.* vi. ſays, inhabited the utmoſt or eaſtmoſt parts of the *Euxine* ſea, whom our author ſuppoſes to have fled out of *Greece*, becauſe they were oppreſſed by their neighbours, and ſtill retained the name of their country.

(4) *Hiberi*, a people of *Aſia*, who are ſuppoſed to have left their native country, and to have come into *Spain*, to which they gave the name of *Hiberia*. It is commonly writ *Iberia*.

(5) The *Albani* were alſo a people of *Aſia*, and contiguous to the *Iberi*.

(6) The *Siculi* were a people of *Latium*, who went over to *Sicily*, ſettled there, and gave their name to that iſland.

(7) *Pelaſgi*, a people of *Greece*, who of old came into *Italy*, and ſettled in *Umbria*, and other places. *Pliny* ſays, they ſettled alſo in old *Latium*.

(8) *Aborigines* were alſo originally of *Greece*. They came over, and ſettled in *Latium*. *Aurelius Victor* ſays, they were called *Aorigines*, a *Greek* name, from their inhabiting the tops of mountains. Others ſay, they were called *Aberrigines*, wanderers or vagabonds; and, by changing one letter, and leaving out another, they were afterwards called *Aborigines*.

dians (9); than becauſe they could not endure their wicked neighbours.

And, that I may not ſpeak of public calamities only, hiſtory has given us an account of ſome private perſons alſo, both in the countries of *Greece*, and in this very *Italy* itſelf, who were deteſtable neighbours: unleſs that the famous *Autolycus* (10) could be a tolerable neighbour to any one; or that *Cacus* (11), who inhabited mount *Aventine* brought any joy to his neighbours, that dwelt upon mount *Palatine* (12). I rather chuſe to make mention of things that are paſt, than of the preſent, that I may not name my own neighbour, who does neither ſuffer a tree of any conſiderable length to ſtand upon our ground, nor a nurſery, without hurting it, nor any thing of a ſtake or prop to ſtand tied to a vine, nor even the cattle to go out to paſture, unleſs there be one to watch them; ſo that it was with very good reaſon, as far as I can judge, that *Marcus Porcius* thought, that ſuch a peſt ought, by all means, to be avoided, and, among the firſt things, forewarned him, that was determined to be an huſbandman, not to come near to it of his own accord.

To the other precepts we add that which one of the ſeven wiſe men delivered to poſterity for ever: *A meaſure is beſt*: that a *meaſure*, a *due proportion*, or *bounds*, ought to be obſerved and kept in all things. And let that be underſtood as ſpoken, not only to thoſe, who are going about other buſineſs, but to thoſe alſo, who are about purchaſing land; that they would not buy what is of a greater extent, than the calculation they have made of things will bear. For, to this, has a reference, and is applicable, that excellent and famous ſentence of our own poet (13); *Commend large fields, but cultivate what's ſmall*; which antient precept, handed down to us, that moſt learned man, in my opinion, pointed at, and expreſſed it in verſe; for, it is a ſaying worthy of the *Carthaginians*, a moſt acute people, *that the land ought to be weaker than the Huſbandman*; for ſince, of neceſ-

gines. They, with other ſtrange people, were the root, as *Pliny* ſays, from whence the *Roman* people ſprang.

(9) The *Arcadians*, a people of *Peloponneſus*, ſent alſo colonies into *Italy*, ſome of which ſettled in *Latium*.

(10) *Autolycus*, a famous robber, frequently mentioned by *Homer*, as grandfather of *Ulyſſes*, by his mother.

(11) *Cacus*, a famous cow-ſtealer, who dwelt on mount *Aventine*. He ſtole *Hercules's* cattle, as he paſſed that way, for which he knocked out his brains, *Livy*, *dec.* 1. *lib.* i. *Virgil*, in his *Æneid*, *lib.* viii. gives a beautiful deſcription of him, and makes him a great monſter.

(12) Two of the ſeven hills on which the city of *Rome* is built.

(13) *Virg. Georg. lib.* ii. 412.

fity

ſity, he muſt wreſtle with it, if the ground prevail, the owner muſt be cruſhed to pieces: nor is it to be doubted, but that land of a large extent, not rightly cultivated, will yield leſs, than that of a narrow extent, exceedingly well cultivated. Wherefore, after the expulſion of the Kings, thoſe ſeven *jugera*, which *Licinius* (14) the *Tribune* of the people, diſtributed to each man, yielded a greater revenue to the antients, than our largeſt fields, which lie fallow, do now. Indeed, *Curius Dentatus* (15), whom we mentioned a little before, having, by his ſucceſsful conduct, obtained a victory, when the people, as a reward of his excellent valour, beſtowed fifty *jugera* of land upon him, thought, that it was a greater eſtate, than was ſuitable, either to one that had been Conſul, or that had had the honour of a triumph: and, having refuſed this public reward beſtowed upon him by the people, he contented himſelf with the ſame proportion the common people enjoyed.

Afterwards alſo, when our victories, and the utter deſtruction of our enemies, had laid deſolate, and ſubdued, a vaſt extent of land; yet it was criminal in a Senator to have above fifty *jugera* (16) in his own poſſeſſion: and *Caius Licinius* (17) was condemned by his own law, becauſe he had by an immoderate deſire of inlarging his eſtate, exceeded that meaſure which he had ſettled and promulgated during his magiſtracy, having brought in a bill for that purpoſe, when he was Tribune of the people, and paſſed it into a law: and this was done, not more becauſe it was a ſymptom of pride and ambition, to take up and occupy ſo much place, than becauſe it was infamous and diſhonourable, that a *Roman* citizen ſhould, by poſſeſſing, in a new and unprecedented manner, more ground than his patrimony enabled him to cultivate, abandon thoſe lands, which the enemy, by running away, had laid

(14) *Liciniana jugera. Varro, lib.* 1. *cap.* 2, ſays, that this diſtribution was made three hundred and ſixty-five years after the expulſion of the kings, which was in the year of the city 244. ſo that this dividend of land was made in the 609th year from the building of *Rome*. We read alſo of a diſtribution of ſeven *jugera per* man, made by a decree of the ſenate, after the conqueſt of *Veii, Tit. Liv. dec.* 1. *lib.* 5.

(15) *Curius Dentatus* was created Conſul, for the firſt time, in the year of the city 463. He refuſed the preſent the people offered him; and, as *Pliny*, in his *Nat. Hiſt. lib.* 8. *cap.* 3. ſays, in a ſpeech he made, affirmed, that he was a pernicious citizen, that could not be content with ſeven *jugera* of land; which was the quantity allowed to the common people, after an end was put to monarchical government.

(16) *Columella* ſays, that the quantity of land allowed by the *Licinian* law, was only fifty *jugera*; but he muſt be corrected by *Varro, lib.* 1. *c.* 3. *Livy, Dec.* 1. *lib.* 7. and *Plin. Nat. Hiſt. lib.* 18. *c.* 3. who all have five hundred *jugera*.

(17) *Caius Licinius Stolo* was Tribune of the people in the year of the city 387. To elude the law, which he himſelf had made, he emancipated his ſon; and, as has been ſaid, put 500 *jugera* in his name, over-and-above what he poſſeſſed and held in his own name. He was accuſed by *Popilius Lænas* the Conſul, condemned, and ſeverely fined. *Val. Max. lib.* 8. *cap.* 6. *Liv. Dec.* 1. *lib.* 7.

waſte, and left without inhabitant. Therefore, as in all other things, ſo alſo in purchaſing lands, a *meaſure* muſt be obſerved: for ſo much ought we to endeavour to obtain, as is neceſſary to make it appear, that we have bought what we ourſelves might enjoy, not wherewithal we might be burdened; and to take away the enjoyment of them from others, after the manner of thoſe over-mighty men, who poſſeſs the bounds of whole nations, which they are not indeed able to go round on horſe-back, but leave them to be trampled upon by cattle, and waſted and deſtroyed by wild beaſts, or keep them occupied by citizens that are indebted to them (18), and their chained ſlaves, where they are both confined, and put to hard labour. But every man's own moderate deſire, capacity, and eſtate, will be a meaſure to him. Nor indeed is it enough, as I ſaid before, to be determined to have lands in your poſſeſſion, if you are not able to cultivate them.

CHAP. IV.

Of the Wholſomeneſs of Countries.

THE precept given us by *Cæſo* (1), comes next to be conſidered, which *Cato* is alſo ſaid to have made uſe of; *viz.* That they who are about to make a purchaſe, ought often to review the land they have a mind to purchaſe. For, at firſt view, it neither diſcovers its faults, nor its hidden good qualities, which afterwards more eaſily ſhew themſelves to ſuch as conſider, and look over it again and again. Alſo our Anceſtors have left us a *formula*, as it were, of inſpection and examination of land that is fat and fertile; of the quality of which we ſhall ſpeak in its own place, when we come to treat of the ſeveral

(18) It was a cuſtom amongſt the *Romans*, to have their creditors delivered up to them, whom they kept in cuſtody, and obliged them to hard labour; and ſent them to their eſtates in the country, to cultivate the ground, and improve their lands, as they did many of their ſlaves. And this reſtraint and confinement of fellow-citizens for debt, the *Romans* called *nexus civium*, which frequently occaſioned many complaints and diſturbances in the ſtate, from the cruelty and hard-heartedneſs of creditors: nevertheleſs, it muſt certainly be much more eligible, to be put to labour the ground, in a wholſome air, with food and raiment, than to ſtarve and rot in a ſtinking priſon.

(1) *Cæſonianum præceptum.* Who this *Cæſo* was, I find not. There were ſeveral great men of this name, about the year of the city 275, and afterwards. Some of them, no doubt, were men of knowledge in Husbandry, and their precepts preſerved to poſterity. *Cato* has the ſame precept in a few words equivalent: *Think it not enough once only to go round the land* you deſign to buy, *lib.* i. *cap.* 3.

kinds of land (2). Nevertheleſs, in general, that which I have, as it were, to teſtify, and frequently to declare and publiſh to all the world; is, what that moſt renowned Captain, *Marcus Attilius Regulus* (3), in the firſt *Carthaginian* war, is reported to have ſaid, That as we muſt not purchaſe land, even ſuppoſe of the fruitfulleſt ſoil, if it be unwholſome; ſo neither muſt we purchaſe what is barren, though it be never ſo wholſome. Which advice *Attilius* gave with greater authority to the Huſbandmen of his own time, as he had acquired ſkill by experience. For hiſtories tell us, that he dwelt in *Pupinia* (4), where the land is both peſtilentious, poor, and unfruitful. Wherefore, as it is the part of a wiſe man, not to purchaſe every-where; nor to be deceived, either with the allurements of its fruitfulneſs, nor with the neatneſs, compactneſs, or delightfulneſs of the place; ſo it is the part of a truly induſtrious maſter of a family, to make fruitful and profitable, whatever he has either purchaſed, or otherwiſe got into his poſſeſſion. For our anceſtors both preſcribed, and left upon record, many remedies for an unwholſome air, whereby its infectious deſtructive influence might be allayed; and, in lean and barren land, the prudence and diligence of the Huſbandman may overcome the barrenneſs of the ſoil. Theſe things we ſhall certainly be able to accompliſh, if we will believe, and receive, as from an Oracle, what the trueſt Poet ever lived ſays (5):

"Take care to learn before, and to obſerve,
"The winds, and changing temper of the air,
"The ſoil, and native genius of each place,
"What fruits it bears, and what it will refuſe."

Nevertheleſs, let us not content ourſelves with the authority of Huſbandmen, either of former, or of the preſent time, and overlook or neglect our own examples, and the new experiments we ſhall have made; which, tho' in ſome particulars it is detrimental, yet, upon the whole, becomes gainful to us; becauſe there is no land that is cultivated, but yields ſome profit: at the ſame time, by attempting and making trials, the proprietor of the land gains this point, that it is

(2) *Lib.* ii. *cap.* 2.
(3) *Marcus Attilius Regulus* was Conſul in the year of the city 459.
(4) *Pupinia*, a place in *Latium*, near *Tuſculum*, of which *Varro* gives a frightful account, *lib.* i. *cap.* 9. "In it were to be ſeen, neither tall trees, nor fruitful vines, nor the *Marſian* fig-tree, nor thick ſtraw; and that moſt of the trees and meadows were withered and dried up, and overgrown with moſs."
(5) *Virgil Georg. lib.* i. 42.

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gradually formed, and brought to the beſt ſtate and condition it is capable of, and to yield all that it poſſibly can. This thing alſo improves and makes the moſt fertile lands turn to greater advantage: therefore we muſt never ceaſe to make variety of experiments. Alſo we muſt be more daring, and hazard more, in a rich fat ſoil, becauſe the effect will neither fruſtrate our labour, nor our expences.

But as it is of great imporrance, what kind of ground, and after what manner we cultivate; ſo alſo, after what manner the manor-houſe is built, and how advantageouſly it is ſituated and diſpoſed: for hiſtory informs us, that many have greatly erred in this point, as thoſe moſt excellent men, *Lucius Lucullus* (6), and *Quintus Scævola* (7); of which, the one built a greater, and the other a ſmaller *villa* than the extent of their land required, both which extremes are hurtful to a man's eſtate. For we are not only at greater charges in building large and wide houſes, but alſo it coſts more to keep them in repair: and when they are ſmaller than the ground requires, the fruits of it periſh and decay. For both moiſt and dry things, which the earth produces, are eaſily ſpoiled, if either there are no houſes at all to bring them into; or if, by being too ſtreight, they are inconvenient. For a maſter of a family, in proportion to his eſtate, ought to have as good and convenient an habitation as poſſible, that he may the more willingly both come into the country, and alſo live in it.

It will alſo be more agreeable to the man, if his wife alſo accompany him: and as her ſex, ſo alſo is her mind more delicate; wherefore ſhe muſt be allured and engaged with ſomething pleaſant and agreeable, to ſtay the more patiently with her huſband. Therefore, let the Huſbandman build elegantly; nevertheleſs, let him not be a *Builder*; and let him take in ſuch an area for his building, that, as *Cato* (8) ſays, neither the *villa* may ſeek for land, nor the land ſeek for a *villa*. We ſhall now explain what manner of ſituation the whole of it muſt have. The building which you begin, as it ought to be placed in a wholſome region, ſo alſo in the wholſomeſt part of the country. For the ſur-

(6) *L. Lucullus*, a very famous *Roman* General, who conquered *Mithridates*, King of *Pontus*, and drove him into *Armenia*. He undertook that war *anno urb. cond.* 680. After he returned with immenſe riches, he gave himſelf up intirely to luxury, magnificent buildings, *&c.* He exceeded all the *Romans* in ſtatues, pictures, villas, *&c.* He was at immenſe charge in making fiſh-ponds at *Baiæ*, near *Naples*. His land could ſcarcely contain his buildings. On the contrary, *Quintus Scævola* had ſo ſmall a *villa*, that he had not where to beſtow the fruits of his land.

(7) *Q. Mucius Scævola* was famous for his knowledge in the civil law, and for his eloquence; mentioned by *Cicero*, *lib.* ii. *de Orat.* He was killed by *Marius*, in the civil wars. There was one of this name Conſul, *an. urb.* 659.

(8) *Cato*, *lib.* i. *cap.* 3.

rounding air, when it is corrupted, brings very many cauſes of hurt and offence to our bodies. There are ſome places, which are not very hot about the time of the ſummer ſolſtice; but, in the colds of winter, have a dreadful appearance, and are intolerably cold, as they ſay of *Thebæ* in *Bœotia* (9). There are other places, which are warm in winter, but burning hot in ſummer, as they affirm is the caſe of *Chalcis* in *Eubœa* (10). Let therefore a temperate air be ſought for, which is neither exceſſively hot, nor cold; which ſort of air commonly the middle of a hill enjoys, becauſe neither being depreſſed, is it torpid with the hoar-froſts in winter, or torrid with hot vapours in ſummer; nor being elevated to the tops of the mountains, does it rage, at all times of the year, with the motions of the winds, and with rains, when below they are very gentle. This ſituation therefore upon the middle of a hill is the beſt; provided nevertheleſs, that the place ſwell out, and be prominent a little, leſt a torrent, formed by the ſhowers, when it flows from the top of the hill, ſhake or pluck up the foundations.

CHAP. V.

Of Water.

AND let there be either within the manor-houſe a ſpring that never dries up, or let it be brought into it from without. Let wood for fire, and forrage, be near at hand. If running-water cannot be had, let well-water be ſought for hard-by, which may neither lie too deep, and be difficult to draw, nor be of a bitter or brackiſh taſte. But if theſe alſo fail you, and the ſmall hopes of ſpring-water force you, let large ciſterns, after all, be provided for men, and ponds for cattle, for gathering and keeping rain-water, which is the moſt proper and ſuitable to the health of the body; and this you may have exceeding good, if you convey it, in earthen pipes, into a covered

(9) *Bœotia*, a country in *Greece*, bordering upon *Attica*, of a foggy unwholſome air, but good for cattle. The inhabitants were, by the antients, reckoned dull and ſtupid. The chief city of it was *Thebes*, now called *Stibes*, and a ſmall village. *Bœotia* borders upon *Doris*, *Phocis*, *Attica*, and *Corinthus*, now called *Stramulipa*, and ſubject to the *Turks*.

(10) *Eubœa*, an iſland eaſt of *Achaia* in *Greece*, now called *Negroponte*, ſeparated from *Achaia* by a narrow ſea (*Euripus*). Its chief city is *Chalcis*. They ſay it is about 130 miles long, and 30 broad. It was long ſubject to the *Venetians*; but now in the hands of the *Turks*. The *Euripus* is now called the *Streight of Negropont*, and is ſo narrow, that *Eubœa* is joined to *Achaia* by a bridge.

ciſtern.

ciſtern. Next to this is running-water, which has its ſource upon the mountains, provided it tumbles down headlong over the rocks, as at *Guarcenum* (1) in *Campania*. Well-water is the third, either that which is found upon riſing ground, or not in the loweſt part of the valley. The worſt of all is marſh-water, which creeps and ſlides along with a ſlow motion. That which always ſtagnates in a marſh, is peſtilent; nevertheleſs this ſame water, tho' of a hurtful nature, yet, in winter, being ſoftened and allayed by the ſhowers of rain, abates of its bad quality: from which we underſtand, that rain-water is exceeding wholſome, becauſe it alſo purges out the pernicious quality of poiſonous water (2): but this we have ſaid to be the moſt approved for drinking. But rivulets, that have a ſtrong current, and a fall, contribute very much to moderate the heats, and to the delightfulneſs of places, which, if the ſituation of the place will allow it, whatever quality they may have, provided they be ſweet, ought, by all means, in my opinion, to be brought into the villa.

But if the river be at a greater diſtance from the hills, and if the wholſomeneſs of the place, and the higher ſituation of its banks, ſhall allow you to place your houſe upon the current, nevertheleſs you muſt take care, that it have the river rather behind than before it; and that the front of the building be turned from the troubleſome and hurtful winds peculiar to that country, and turned towards thoſe that are moſt friendly; for moſt rivers are covered and hid from you with hot miſts in ſummer, and with cold miſts in winter, which, unleſs they be carried off by the greater force of the winds that blow upon them, prove deſtructive both to men and cattle. But, as I ſaid, in ſuch places as are wholſome, it is beſt to turn the front of the manor-houſe towards the eaſt or ſouth; and, in ſuch as are unwholſome, towards the north. And a villa looks always rightly to the ſea, when it is beat upon and

(1) *Guarcenum* in *Campania*. There is no mention of this place by *Pliny*, or any other author I have ſeen. Probably there is an addition or tranſpoſition of one or two letters. *Pliny* mentions ſeveral times *Mons Gaurus*, and *vinum Gauranum* in *Campania*. This mountain lies near to *Baiæ* or *Puzzuolo*; and, on the ſide of the hill looking towards theſe places, there is excellent wine; ſo that our author perhaps means ſome town that ſtood near this hill, and took its name from it.

(2) Rain-water, by moſt authors, is accounted the wholſomeſt. *Vitruvius* ſays, that the lighteſt and moſt ſubtile particles are extracted from all the fountains, and carried up into the air, by the conſtant motion of which, it is agitated, ſtrained, and liquefied; and then it falls to the earth. *Hippocrates*, *Galen*, &c. commend it, becauſe it is light, ſweet, clear, and thin. Some authors ſay, that ſummer rain-water, which falls in time of thunder, is better than that of common ſhowers; and that water of melted ſnow or ice is the worſt of any. *Cornelius Celſus* ranks them thus, with reſpect to their weight; rain-water, ſpring-water, river-water, well-water; next to theſe, that of ſnow and ice; that of a lake is weightier, and of a marſh is heavieſt of all.

ſprinkled

ſprinkled with the waves thereof, but never from the bank, or when it is a little removed from the ſhore: for it is better to have fled back to a great than to a ſmall diſtance from the ſea; for the intermediate diſtances are of a groſſer air. Nor indeed muſt there be a marſh near the buildings, nor a public highway adjoining: for the former always throws up noxious and poiſonous ſteams during the heats, and breeds animals armed with miſchievous ſtings, which fly upon us in exceeding thick ſwarms; as alſo ſends forth, from the mud and fermented dirt, envenomed peſts of water-ſnakes and ſerpents, deprived of the moiſture they enjoyed in winter; whereby hidden diſeaſes are often contracted, the cauſes of which, even the phyſicians themſelves cannot thoroughly underſtand: and alſo, at all times of the year, the dampneſs and moiſture rots and ſpoils the implements of huſbandry, houſhold furniture, and the fruits of the ground, that are either laid up in ſtore, or not as yet brought into the houſe. And the latter is a burden to your eſtate, by the plunderings of travellers that paſs by, and the conſtant entertainment of thoſe that come to lodge with you.

Wherefore I adviſe you to avoid theſe inconveniencies, and to build a manor-houſe neither by the highway, nor in a peſtilential place, but at a great diſtance from them, and upon a higher ſituation; and that the front of it be directed to the riſing of the ſun at the time of the equinox; for this kind of ſituation keeps an equal balance, and a well-adjuſted medium between the winter and ſummer winds. And the more declining towards the eaſt the ground is, on which the building ſtands, the more freely will it receive the cool paſſing breezes in ſummer, and be leſs incommoded or hurt with ſtorms in winter, and ſo be thawed with the riſing ſun, that the frozen dews may melt: for that ground is reckoned almoſt peſtilential, which is not within the reach of the ſun, and not expoſed to breezes warmed with the ſame; which if it want, there is no other thing of any efficacy to dry up and wipe off the nocturnal hoar-froſts, and any ſort of ruſt, mildew, or filth, that fixes upon it. And theſe things are not only deſtructive to men, but alſo to all ſorts of cattle, and to every green thing whatſoever, and to their fruits.

But whoſoever has a mind to build upon a ſloping area, let him always begin at the lower part; becauſe when the foundations are begun from the more depreſſed place, they will not only eaſily ſupport their own ſuperſtructure, but alſo ſerve as a butteridge and underpropping againſt ſuch things, as ſhall afterwards be applied to the upper part, if peradventure he has a fancy to inlarge the villa: for the buildings that have been raiſed before from the lower part, will powerfully

reſiſt

reſiſt and bear up againſt thoſe that, being placed above them, ſhall lean and reſt upon them. But, if the uppermoſt part of the riſing ground, being made the foundation, ſhall have received the weight of its own ſuperſtructure, whatever you join to it afterwards from the lower part, will become full of clifts and chinks; for a new building, when it is built and joined to an old, and that which is freſh to what is full of chinks, it, as it were, ſtruggling againſt the weighty load that preſſes upon it, gives way; and that, which was firſt built, will preſs upon that which gives way, and, being gradually weighed down, will be pulled down headlong with its own weight. Therefore this fault, in the way of building, muſt be avoided when the foundations are firſt laid (3).

CHAP. VI.

Of the Poſition and Diſpoſition of a Manor-houſe.

ALSO let the meaſure, ſize and number, of the ſeveral parts of the villa be proportioned to the whole incloſure (1), and let it be divided into three parts; one for the uſe of the city, another for the ruſtics, and a third for the fruits of the ground. Again, let that for the city be diſtributed in ſuch a manner into ſummer and winter apartments, that the bedchambers for winter may look towards the ſun-riſing in the middle of winter; the dining-rooms to the ſun-ſetting at the time of the equinox. Again, let the ſummer bedchambers be ſo contrived, as to receive the ſun at noon at the time of the equi-

(3) The laſt ſentence of this fifth chapter is ſomewhat perplexed; and, as *Urſinus* ſays, it ſeems neceſſary to change *ſurgenti* into *urgenti*, in order to make it tolerable ſenſe, which I wiſh were juſtified by ſome good manuſcript.

(1) Whole incloſure (*univerſo conſepto*) ſignifies the whole ground taken in and incloſed to build the villa upon. Theſe villas, among the *Romans*, while their antient ſimplicity laſted, were but very mean buildings, ſimple accommodations for their ſervants, and receptacles for the fruits of the ground, and a ſmall apartment for the maſter and miſtreſs of the family, *&c.* But, as their riches and luxury increaſed, they became much more magnificent; and a ſumptuous and magnificent villa ſeems to have been the darling pleaſure, even of the wiſeſt and moſt moderate among them: ſo that they ſeem to have expended more upon their houſes in the country, than they did upon thoſe in the city. And even private citizens, when *Rome* was, in a manner, miſtreſs of the world, ſeem to have exceeded moſt of our modern princes in the circumference, architecture, magnificence, and conveniencies of their villas. And when thoſe of private perſons were ſo ſtately, what muſt thoſe of more eminent ſtation have been, as that of *Mæcenas*, *Lucullus*, *Cicero*, &c.? As for thoſe of the *Cæſars*, &c. ſo frequently mentioned by antient authors, they were, no doubt, beyond what we can imagine.

nox 3,

nox (2); but let the dining-rooms of that ſeaſon look to the ſun-riſing in winter. Let the bathing-places be turned towards the ſun-ſetting in ſummer, that they may be well lighted in the afternoon, and till the evening. Let the places for walking in be ſo ſituate, with reſpect to the ſouth, that they may receive much ſun in winter, and very little in ſummer.

But, in the ruſtic part, there ſhall be placed a large and lofty kitchen, that the timber-work may not be expoſed to the danger of fire, and that all the ſervants belonging to the family may ſtay in it conveniently at all times of the year. Cells for ſuch ſervants as are not in bonds (3), will be beſt contrived, when they are made to look to the ſouth, ſo as to receive the ſun at the time of the equinox; and, for ſuch as are in chains, a moſt wholſome ſubterraneous priſon-workhouſe (4), receiving its light from very many narrow windows, and ſo high from the ground, that one may not be able to touch them with his hand (5).

Such

(2) *Spectet meridiem æquinoctialem.* As the meridian of a place is the ſame throughout the whole year, and, when the ſun comes to that line, it is ſtill the ſame, with reſpect to the houſe; yet, as the ſun riſes higher and higher upon that line, till it comes to the ſolſtice, ſo here the author muſt mean, that the bedchambers be ſo contrived, as to receive the ſun when it comes to the meridian at the time of the equinox.

(3) *Servis ſolutis.* The *Romans* ſuffered ſuch of their ſlaves as they had confidence in, and were not apprehenſive of their running away, to be without chains; but ſuch of them as they feared might make their eſcape, they kept in chains, and ſhut them up at night: others of them were put in chains for crimes, and kept priſoners as long as they thought proper.

(4) *Ergaſtulum*, among the *Romans*, was a ſubterraneous building belonging to every conſiderable villa. It properly ſignifies a workhouſe; but it was made uſe of as a priſon, wherein they confined their ſlaves at night, that they might not make their eſcape; and therein they ſhut up, and kept to hard labour, ſuch of their ſlaves as were guilty of any misbehaviour. Theſe private priſons ſoon became great grievances, and great complaints were brought againſt them in *Auguſtus* and *Tiberius*'s time, not only becauſe of the great cruelty of maſters, but becauſe *Roman* citizens and ſtrangers were unlawfully ſhut up and detained in them; for which reaſon theſe private priſons were intirely ſuppreſſed by *Adrian*, and other ſucceeding Emperors.

(5) *Varro*, *l.* i. *c.* 11, 12. gives the following directions relating to the building of a villa: 'A villa muſt be built proportionable to the land belonging to it, that there may be 'room for laying up the fruits thereof in their ſeveral ſtorehouſes, which muſt be contrived 'according to the quantity of each ſort of fruit. If your land abound in wine, your wine-'cellars muſt be the larger; if in corn, your barns. You muſt eſpecially take care, that 'there be water within the incloſure of the villa; if not, as near as poſſible. The firſt 'thing is to have it ſpringing up within the villa; the next is to have it conſtantly running 'into it. If there be no living-water, ciſterns muſt be made within doors for men, and 'ponds in the open air for cattle. You muſt take care eſpecially to place your villa at the 'bottom of a hill covered with wood, where there may be wide paſtures; and that it be 'expoſed to the moſt wholſome winds that ſhall blow in that country. That which is 'placed toward the riſing of the ſun at the time of the equinox, is the moſt convenient,

'becauſe

Such ſtables muſt be made for the cattle, as cannot be incommoded either with the heat or the cold. Let there be double ox-ſtalls for cattle broken for labour, one for ſummer, and one for winter. But for other ſorts of cattle, which, it is proper, ſhould be within the manor-houſe, let there be places, partly covered, partly in the open air, ſurrounded with high walls, that, in the one, they may take their reſt during winter, and in the other in the ſummer-time, without being expoſed to the fury of wild beaſts. But let all the ſtables be ſo ordered, that no water may run into them; and that all the moiſture that is formed and gathered therein, may ſlide out as quickly as poſſible, that neither the foundations of the walls, nor the cattles hoofs, may be rotted and ſpoiled. The ſtalls for the oxen muſt be ten, or at leaſt nine, feet broad. This meaſure will be ſufficient both for the cattle to lie down in, and for him that yoketh them, and driveth the plough or the wain, to go round them, and do what offices are proper to be done to them while unyoked. It is not proper, that the mangers be placed higher, than that an ox or an horſe may be able to feed ſtanding without inconveniency.

Let there be an habitation made for the Bailiff hard-by the gate, that he may have a view of them that go out and come in; and one for the Steward (6) above the gate, for the ſame reaſons; nevertheleſs let him be near to, and have his eye upon, the Bailiff (7): and let them both

'becauſe in ſummer it has the ſhade, in winter the ſun. If you are forced to build hard-'by a river, take care you do not place your villa fronting to it, becauſe, in winter, it 'will be vehemently cold; and, in ſummer, not wholſome. You muſt alſo advert, if there 'be any marſhy places near it, both for the reaſons before-mentioned, and becauſe they 'dry up; and certain ſmall animals breed therein, which the eyes cannot perceive; and 'they come through the air, and enter into the body by the mouth and noſtrils, and occa-'ſion dangerous diſtempers. And care muſt be taken, that the villa look not towards thoſe 'parts, from whence unwholſome grievous winds uſe to blow; and that you place it not 'in a hollow valley, but rather build upon an eminence; for, where there is a thorough 'air, if any thing noxious is brought in, it is more eaſily diſcuſſed. Moreover, that which 'is illuſtrated by the ſun the whole day, is more wholſome; becauſe the little beaſts, if 'any breed near it, and are brought into it, are either blown out of it again, or ſoon periſh 'by the drineſs of the place. Sudden ſhowers and torrents, or rapid rivers, are dangerous 'to thoſe, who have houſes in low and hollow places; and the ſudden incurſions of bands 'of thieves and robbers, becauſe they can more eaſily ſurpriſe thoſe who are not aware of 'them. From theſe inconveniencies the higher places are ſafeſt.'

(6) *Procurator*, no doubt, is the Steward; and, according to our author, he is to have a watchful eye over the Bailiff, and conſequently a ſuperior officer; tho' *Pompa* ſays he is *ſocius villici, & omnibus rebus adminiſter*. He kept the family accounts, and thoſe of the whole eſtate. The name is applicable to a great many different things, of which a man may have the overſight committed to him.

(7) *Villicus* properly was an officer, who had the direction of cultivating the ground, and employing the ſervants for that purpoſe, according to their ſeveral capacities; and to ſee that they did their buſineſs, had their victuals, cloaths, *&c.* duly given them. He was

both have a magazine hard-by, where all the implements of Huſbandry may be laid up. Let cells be placed for the Herdſmen and Shepherds hard-by their own cattle, that they may have the conveniency of ſallying out eaſily at any time to take care of them. Nevertheleſs they ought all to lodge as near to one another as poſſible, that ſo the diligence and care of the Bailiff may not be too much extended, when he goes round all the different parts; and that they may be witneſſes among themſelves of each other's diligence or negligence.

As to that part appropriated for the fruits of the ground, it is divided into an oil-cellar, a place for the wine and oil-preſſes, a wine-cellar, a place for boiling muſt (8), hay-lofts, ſtraw and chaff-lofts, ſtorehouſes, and barns, that ſuch of them as are even with the ground may be uſed for keeping of moiſt things, as wine and oil for the market; but that ſuch things as are dry may be gathered together, and laid up in lofts, as all ſorts of corn, hay, leaves, ſtraw, chaff, and all the other ſorts of forrage. But let the granaries, as I ſaid, be acceſſible only by ladders; and let them receive air from the north by very ſmall windows; for that quarter of the heavens is the coldeſt, and the leaſt moiſt of any; both which contribute much to the preſervation of corn laid up in granaries. There is the ſame reaſon for the wine-cellar's being placed in the lower part of the houſe, which ought to be at a great diſtance from the baths, oven, dunghil, and other naſtineſſes, which ſend forth a ſtinking ſmell; nor ought it to be at a leſſer diſtance from ciſterns, caſcades, or ſpouts of water, from which there is a moiſture attracted, which corrupts and ſpoils the wine.

Nor does it eſcape me, that there are ſome who think, that a barn, covered with an arched roof, is the beſt place for laying up corn in, the ground or earthen floor of which, before it is paved, or any other flooring laid upon it, being dug up, and moiſtened with freſh lees of oil, and not with what has ſalt in it, is beat cloſe together with rammers, like *Signinian* work (9). Then, after it is fully dry, they cover

an officer of great truſt among the *Romans*, eſpecially thoſe who applied themſelves to agriculture. He had the overſight and care of the whole villa.

(8) *Defrutarium* was the place where they boiled their muſt, in order to reduce it to one third, or an half, of the firſt quantity. The firſt they called *defrutum*, the ſecond *ſapa*, according to our author, *lib.* xii. *c.* 21. Of this muſt, boiled in to a certain quantity, or *rob of grapes*, as I ſometimes call it, the antients made great account: they mixed it with their wines, in order to preſerve and keep them from ſpoiling; they preſerved their fruits with it, and, as may be ſeen in this author, applied it to ſeveral uſes.

(9) *Signia*, a town in *Latium*. The inhabitants were called *Signini*. They, it ſeems, contrived a plaiſter or flooring made with bruiſed tiles, or ſheards of earthen veſſels, and lime, tempered together. With this compoſition they made very durable floors, *&c.* and this they called *opus Signinum*. See *Plin. nat. hiſt. lib.* XXXV. *cap.* 12.

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it over, in like manner, with floorings made of bruiſed tiles, which, inſtead of water, have been tempered and wrought with lees of oil, mixed with lime and ſand, and which, with great force, are beaten down with rammers, and ſmoothed; and all the joinings of the walls and the floors are buttoned with bolſterings made of bruiſed brick or tile: for, as buildings commonly crack and fall into chinks in theſe parts, they afford holes and lurking-places for ſubterraneous animals. But the granaries are alſo diſtinguiſhed with partitions or corn-bings, that every ſort of pulſe may be placed ſeparately by itſelf. The walls are plaiſtered with clay well wrought with lees of oil, with which, inſtead of ſtraw, are mixed the dry leaves of the wild olive; or, if theſe cannot be had, thoſe of the olive-tree. Then, when the foreſaid plaiſter is dried, it is ſprinkled over again with the lees of oil; and, after it is dried, the corn is brought in. This ſeems to be the moſt proper of any thing for preſerving corn, or any other fruits of the earth whatſoever, that are laid up in ſtore, from receiving hurt from wevils, and ſuch-like animals, which, unleſs they be carefully laid up, are quickly conſumed by them.

But this kind of barn, which I have deſcribed, unleſs it be ſituated in a dry part of the manor-houſe, corrupts, with mouldineſs and dampneſs, even the ſtrongeſt grain whatſoever. And, if there be no moiſture there, corns may be alſo kept in pits under-ground, as in certain provinces beyond ſea, where the ground, being dug up after the manner of wells, which they call *ſiros* (10), receives the fruits which itſelf produced. But we, in our regions, which ſuperabound in moiſture, rather approve of ſuch a barn as is raiſed high above-ground, and of this careful way of making the floors and the walls of it; for, as I ſaid before, the floors and ſides of the barns, being thus ſecured, hinder the wevil to get in. Many think, that, when this kind of deſtructive peſt gets into the corn, it may be thrown out, or checked, if the corns that are gnawn, be winnowed in the barn, and, as it were, cooled and refreſhed. But this is intirely falſe; for, by ſo doing, thoſe animals are not thrown out, but are mixed with the whole heaps of corn;

(10) *Siros*, in *Greek* σειρὸς, ſubterraneous granaries, or caves for holding corn, or holes dug in the ground. Some think it is originally a *Perſian* word. *Varro*, *lib.* i. *c.* 57. ſays, that they were in uſe in *Cappadocia* and *Thrace*; and that they made uſe formerly of ſuch repoſitories for their grain in ſome parts of *Spain*, and about *Carthage*; that they covered their bottoms with chaff and ſtraw, and took great care, that no moiſture ſhould get into them, or the air reach them, except when they brought them out for uſe; for, where no air comes, the wevil does not breed. Wheat, he ſays, laid up in this manner, will keep even forty years without ſpoiling; and millet a hundred. He adds, that, when they open them, they muſt ſtay ſome time before they go down into them, for fear they be ſtifled.

which, if they continue as they are, without being moved, only ſuffer damage in the upper parts, becauſe the wevil never breeds below the ſpace of an hand-breadth; for it is much better to expoſe that only which is already ſpoiled, than the whole, to danger: for, when you have occaſion to uſe it, it is eaſy, after you have taken away that which is damaged, to make uſe of that which is lower, and altogether ſound. But tho' I may ſeem to have mentioned theſe things out of their proper place, yet I have not done it unſeaſonably.

The oil and wine-preſſes, and the oil-cellars eſpecially, ought to be warm, becauſe every kind of liquor is more eaſily diſſolved or kept fluid with a gentle heat, and is more bound up and congealed with cold. Oil, if it freezes, which ſeldom happens, will grow muſty, and corrupt. But as natural heat is wanted, which is procured by the ſituation and the climate, ſo there is no occaſion for fire, or the flame of a candle, becauſe the taſte of the oil is ſpoiled by ſmoke and ſoot: for which reaſon the oil-preſs ought to receive light from the ſouth quarter, that ſo we may be under no neceſſity of making uſe either of a fire or a lamp, when the olive-berries are preſſed.

Let the caldron-room, where your ſodden wine, or rob of grapes, is made, be neither narrow nor dark, that ſo the ſervant, who has the charge of boiling it down to a certain quantity, may go about his buſineſs without inconveniency. The ſmoke-room alſo, wherein wood, that has not been long cut, may be ſpeedily dried, may be made in the ruſtic part of the manor-houſe, joining to the ruſtic baths; for theſe are alſo neceſſary for the ſervants to bathe in, but only upon holydays; for the frequent uſe of them is, by no means, proper for ſtrengthening the body.

Repoſitories or ſtorehouſes for wine will be rightly placed above thoſe places, from whence, for the moſt part, ſmoke ariſes; for wines grow old more quickly, and attain to early maturity, by an uninterrupted communication of ſmoke to them: for which reaſon there ought alſo to be another loft, whither they may be removed, leſt, on the other hand, they be tainted with too much fumigation. As to what relates to the ſituation of the manor-houſe, and the diſpoſition of the ſeveral parts thereof, enough has been ſaid.

Moreover, it is neceſſary, that thoſe things alſo be about a manor-houſe; an oven and a mill, of ſuch bigneſs as the number of the future inhabitants ſhall require; two ponds at leaſt, the one for the ſervice of cattle, and for geeſe; the other in which we may ſteep lupines, willows, rods, and other things, which are proper for our occaſions. Let there be alſo two dunghils, one which may receive new off-ſcourings and

and filth, and keep them a whole year; and a ſecond, from which the old may be carried. But let both of them have their bottoms ſomewhat ſhelving, with a gentle deſcent, in the manner of ponds, both well built and paved, that they may not let the moiſture paſs through; for it is of great importance, that the dung retain its ſtrength by the juice of it not being dried up; and that it be continually ſoaked in liquor, that ſo, if there be any ſeeds of thorns or graſſes thrown into it, with ſtraw or chaff, they may periſh, and, when carried out into the fields, not fill the corns with weeds. Wherefore ſkilful Huſbandmen, whatever ſweepings they carry out of the folds or ſtables, they put hurdles made of rods upon them, and cover them, and don't ſuffer them to dry with the winds, or be burnt up with the violent heat of the ſun.

The threſhing-floor, if it can be conveniently done, muſt be ſo placed, that the Maſter, or the Steward at leaſt, may look down from his apartment into it. That is the beſt which is paved with flint, becauſe the corns are both quickly beaten out, when the ground does not yield to the beating and thumpings of the hoofs of the cattle, and of the threſhing-inſtruments; and alſo when the ſame are winnowed, they are cleaner, and without ſtones and ſmall clods of earth, which commonly a threſhing-floor, made of earth, throws up during the threſhing. And there ought to be a ſhed built adjoining to the threſhing-floor, eſpecially in *Italy*, becauſe of the inconſtancy of the weather, into which the corn, that is half-threſhed, may be carried, and ſheltered, if a ſudden ſhower ſhould unexpectedly happen: for, in ſome countries beyond-ſea, where there is no rain in ſummer, there is no occaſion for this. The orchards and gardens muſt be incloſed or walled round, and be near at hand, and in that part, into which all the dung and dirt of the poultry-yard and bagnios, and the rotten lees ſqueezed out of the olive-berries, may flow; for both the pot-herb and the tree is made glad and thrives with this kind of nouriſhment.

CHAP. VII.

Of the Offices of a Maſter of a Family.

AFTER the owner has got into his poſſeſſion all theſe things, either ready prepared to his hand, or has put them into this order and condition himſelf, as in all other things, ſo principally with reſpect to men, his own chief care is requiſite; and theſe are either farmers,

farmers (1), or ſervants looſe or kept in chains. Let him treat his farmers with civility, and ſhew himſelf eaſy and gentle towards them, and more greedily exact their work than their payments from them; becauſe this is both leſs offenſive to them, and, upon the whole, is of greater advantage; for, where land is carefully cultivated, for the moſt part, it brings gain, and never any loſs (except when ſtorms and tempeſts (2), or the outrageous violence of robbers, ſurpriſe them); therefore the farmer dares not demand an abatement.

But neither ought the landlord to be tenacious of his own right in every thing to which he has bound his tenant; ſuch as in exacting punctual payment upon the very days the money becomes due, and wood and other additional duties, over and above his rent, the care of which brings greater trouble than expences to peaſants. Nor indeed muſt we exact all that the law allows; for the antients thought, that the *rigour of the law was the greateſt oppreſſion and vexation:* nor, on the other hand, muſt we intirely give up our claim and right, becauſe even the beſt of debtors, as *Alphius the uſurer* (3) is reported to have ſaid very truly, become bad, by not being called upon to make their payments. And I myſelf have heard *Lucius Voluſius* (4), an antient man, who was Conſul in our memory, and a very rich man, affirm, that that landlord's eſtate was the moſt happy, which had tenants that were natives of it, and, by a long familiarity, even from their very cradles, always retained them, as if they had been born upon their own paternal inheritance. And indeed it is my opinion, that frequent letting of the ground is a bad thing; but that nevertheleſs a farmer that lives in town is the worſt, who chuſes rather to cultivate land by his ſervants,

(1) The *Romans* frequently lett their lands to freemen, who either paid them in kind, or in money, ſo much yearly; or they gave them a certain allowance for their labour, and the landlord had the remainder. Sometimes they cultivated them by their ſlaves, under the care and direction of a Bailiff, as has been already mentioned.

(2) Unuſual ſtormy tempeſtuous weather was, by the *Romans*, called *vis major cæli.* The *Greeks* called it Θεῦ βίαν, whereby they ſignified, that ſtorms of wind, hail, lightning, *&c.* which prove deſtructive to the fruits of the ground, are calamities ſent by Heaven for the puniſhment of mortals. And it may be remarked, as an inſtance of the equity of their laws, that, in the opinion of their greateſt lawyers, when the fruits of the earth were thereby more hurt than the tenant was able to bear, he was not to ſuſtain the loſs; *non debet conductori eſſe damnoſa, leg.* 19. *digeſt. tit.* 2. *locati conducti.* The landlord, I ſuppoſe, not only loſt his rent for that year, but alſo maintained his tenant, if all was ſwept away, as frequently happens in thoſe countries.

(3) *Alphius*, a famous uſurer, whom *Horace* mentions in his ſecond epode; a man who underſtood his own intereſt mighty well, and how to place his money to the beſt advantage.

(4) *Lucius Voluſius Saturninus* was Conſul in the year of the city 808. He is called *Quintus Voluſius* in the *Faſti.* He is ſeveral times mentioned by *Pliny*, particularly *lib.* vii. *c.* 14, *&* *c.* 48. as having lived to a very great age.

than by himſelf. *Saſerna* uſed to ſay, that, from ſuch a man as this, inſtead of your rent, you have commonly a law-ſuit: for which reaſon we muſt be at ſome pains to retain people that live conſtantly in the country for our farmers, and ſuch as may continue with us, when either we are not at liberty to cultivate our land ourſelves, or that it is not expedient to do it by our ſervants; which nevertheleſs does not happen but in thoſe regions, which are uninhabited and deſolate, by reaſon of the badneſs of the air, and the barrenneſs of the ſoil. But when the air is tolerably wholſome, and the land tolerably good, it never happens, that every man's own care does not bring him in more from his land, than that of a farmer; nor does it ever happen, even ſuppoſe you commit it to a Bailiff, unleſs either the greateſt negligence or rapaciouſneſs of the ſervant intervene; both which crimes, there is no manner of doubt, are, for the moſt part, either committed or cheriſhed by the maſter's fault, ſeeing he has it in his power to beware either not to ſet ſuch a perſon over his affairs, or to take care to remove him after he has appointed him.

Nevertheleſs, in lands that lie at a great diſtance, to which a maſter of a family cannot eaſily make excurſions, it is more tolerable to have any kind of land in the hands of farmers, that are freemen, than of Bailiffs, that are ſlaves, but eſpecially corn-land, which a farmer cannot at all deſtroy, and turn topſy-turvy, (as he may do vineyards, and plantations of trees for ſupporting vines) and which ſervants do great miſchief to, who lett out your oxen to hire, and feed both them and the other cattle very ſorrily; nor do they carefully plow the ground; and charge to your account much more ſeed ſown, than what they have really ſown. But neither do they aſſiſt what they have committed to the earth, in ſuch a manner, as that it may yield a good increaſe. And, when they have brought it into the threſhing-floor, while they are threſhing it, they daily leſſen it, either by their knaviſh tricks or negligence; for they both ſteal it themſelves, and neglect to keep it ſafely from other thieves. Neither do they faithfully bring to their account what they have laid up in ſtore. So it comes to paſs, that both the agent and the other ſervants are tranſgreſſors, and the land is often defamed and decried. Wherefore I am of opinion, that a manor of this kind ought to be lett, if, as I ſaid, it muſt be deprived of the preſence of the landlord.

CHAP.

CHAP. VIII.

(1) *Of Cattle, and of Herdſmen and Shepherds, and ſuch as have the Overſight of Cattle.*

THE next care is concerning ſervants, what office or buſineſs it may be proper to ſet ſuch and ſuch of them over, and to what works to deſtinate each of them: therefore I premoniſh, that we take care not to inſtitute and appoint a Bailiff out of that kind of ſervants, who have pleaſed with their body; nor indeed of that order, who have exerciſed any city-trades, or delicate crafts. This kind of ſlaves is ſluggiſh and ſleepy, accuſtomed to eaſe and idleneſs, ſports and diverting ſights in the *Campus Martius*, the *Circus*, and the *Theatres*; to dice, tipling-houſes; and common ſtews; and they never ceaſe to dream of the ſame follies, which when they have transferred into Huſbandry, the maſter does not ſuſtain ſo much loſs in the ſervant himſelf, as he does in his whole affairs.

One muſt be choſen, who is hardened to rural labour and buſineſs from his infancy, and is well known by trials of his capacity. Nevertheleſs, if you have no ſuch perſon as this, let one of thoſe be ſet over your affairs, who have undergone a laborious ſervitude; and he muſt be of ſuch an age as to be paſt the *prime of his youth*, but not as yet upon the borders of *old age*; leſt the *firſt* leſſen his authority to command, ſeeing thoſe that are more advanced in years think it below them to obey a ſtripling; and leſt the *ſecond* ſuccumb under the weight of a moſt laborious employment. Let him be therefore of a middle age, of firm ſtrength, ſkilful in rural affairs, or at leaſt a perſon of the greateſt diligence and care, that he may learn the more quickly: for it is not the way to forward our buſineſs, that one ſhould command, and another teach; for he is, by no means, capable of exacting and ſeeing work rightly done and finiſhed, who learns, from one that is ſubject to him, what, and in what manner it muſt be done.

Alſo one that is illiterate, provided he have a very tenacious memory, may do the buſineſs conveniently enough. *Cornelius Celſus* ſays, that a Bailiff of this ſtamp oftener brings money to his maſter, than his book; becauſe, not knowing letters, he may be leſs able to forge,

(1) The title of this chapter is very improper, there being no mention therein either of cattle, or of thoſe that take care of them; but only of the Bailiff and his office, and the care and attention that a maſter of a family ought to beſtow, both upon him and his other ſervants.

contrive,

contrive, and frame accounts by himſelf, or may be afraid to do it by another, becauſe he will be privy to his villainy. But whatever he be who is your Bailiff, you muſt aſſign him one of your women for a mate to live with him, that ſhe may reſtrain him, and yet be a help to him in ſome things.

The ſame orders muſt be given to the Steward or Agent, that he may not have any intimate correſpondence with any of the domeſtics, and much leſs with a ſtranger. Nevertheleſs, if he ſhall know any one of them to be active and forward in managing and diſpatching buſineſs, let him condeſcend to admit him ſometimes to his table, upon an holiday, as a mark of his reſpect. Let him offer no ſacrifices but by the order and direction of his maſter. He ſhall not admit into the houſe any diviners or cunning-women; both which kinds of perſons, with their vain ſuperſtition, drive ignorant and unexperienced minds to expences, and afterwards to flagitious practices. Neither ſhall he know any thing of the city, or of any fairs or public markets, unleſs it be in order to buy or ſell any thing belonging to himſelf; for a Bailiff, as *Cato* ſays (2), ought not to be a walker or rambler, nor to go out of his bounds, unleſs it be in order to learn ſomething relating to Agriculture; and this is to be allowed, if it be ſo near at hand, as he may be able to come ſoon back again. Let him not ſuffer any foot-paths, or new boundaries or land-marks, to be made in the land; neither let him entertain any gueſt, unleſs he be his maſter's friend, or intimate acquaintance and relation.

As the Bailiff muſt be reſtrained from theſe things, ſo he muſt be exhorted to take care of all the implements of Huſbandry, and iron tools, and that of them he lay up well repaired, and keep in ſafe cuſtody, double of what the number of the ſervants requires, that there may be no occaſion to borrow from neighbours; becauſe there is more loſt in the ſervants day's work, than is ſpent in the price of things of this ſort. Let him keep all the ſervants neat, and rather uſefully than delicately cloathed, and carefully ſecured from the wind, cold, and rain; all which are provided againſt, and kept off, with leather-coats with ſleeves, coats made up of many patches, and ſhort frocks with cowls. If this be done, no day is ſo inſupportable, wherein ſomething may not be done in the open air.

Let him not only be a ſkilful artiſt, with reſpect to every thing relating to Huſbandry, but alſo be furniſhed with the virtues of the mind, as much as his ſervile diſpoſition and temper of mind does admit, that

(2) *Cato*, v. 2.

he may neither govern with remiſneſs, nor with cruelty. Let him always cheriſh ſome of thoſe that are good; nevertheleſs let him alſo ſpare thoſe that are not ſo good as they ought to be, ſo that they may rather fear his ſeverity, than deteſt and abhor his cruelty. This point he may gain, if he will rather chuſe carefully to keep thoſe that are under his command from committing faults, than, by his own negligence, lay himſelf under a neceſſity of puniſhing delinquents. And there cannot be a *ſtronger guard* ſet even upon the wickedeſt man living, than a rigorous exacting of his work. Let the Bailiff always make his appearance, and ſhew himſelf, that the daily taſks may be performed; for ſo both the overſeers and directors of ſuch and ſuch particular works will carefully execute their offices; and the reſt of the ſervants, after they are fatigued with their work, will rather ſet their mind upon reſt and ſleep, than upon pleaſure and paſtime.

Now, I wiſh that thoſe antient, but excellent cuſtoms, which are now become obſolete, could be brought again into uſe: *Let him not make uſe of the ſervice of any of his fellow-ſervants, but in affairs belonging to his maſter. Let him not eat but in the ſight of all the ſervants, nor any other thing but what is given to the reſt*; for thus he will take care, that both the bread be well baked, and the other things be wholſomely prepared. *Let him not ſuffer any body to go without the bounds, unleſs he be ſent by himſelf; but neither let him ſend them himſelf, unleſs when great neceſſity obliges him. Neither let him carry on any buſineſs or commerce of his own, or employ his maſter's money in buying either animals, or any other things, in order to ſell again*; for this trafficking diverts the Bailiff from the care *of his maſter's affairs*, and never ſuffers him to balance accounts with him, and to pay him to the full; but, when he is required to pay the money, inſtead of the money, he ſhews the goods.

Nevertheleſs, upon the whole, this one thing, above all others, muſt be required of him; *viz.* that he do not think himſelf to know any thing whatſoever, which he is ignorant of; but that he always ſeek to learn what he does not know: for, when it profits much to do any thing ſkilfully, then it hurts more to have done it amiſs. For there is one thing, and that only, which bears ſway, and is the turning point in Huſbandry; *viz. to do, once for all, whatever the method and manner of the Culture requires*; for whenever the imprudence or neglect is rectified, the thing itſelf has already ſuſtained damage; nor does it afterwards yield ſuch abundant increaſe, as both to reſtore itſelf ſo far as it is loſt, and to recover and make up the gain you might have got by it in times paſt.

As to the other ſervants, thoſe following precepts muſt, for the moſt part, be obſerved; and I don't repent, that I myſelf have kept them carefully; *viz.* that I would oftener, and with greater familiarity, ſpeak to rural than to town ſervants, provided they had behaved themſelves tolerably well; and when I underſtood, that their conſtant labour was alleviated by the maſter's gentle behaviour and affability, I would ſometimes alſo jeſt and be merry with them, and allow them greater liberty to have their jeſts. This alſo I often do: I deliberate and adviſe with them concerning any new works, as with perſons that have more ſkill, that thereby I may know what ſort of genius, and what ſtock of prudence, every one of them has. Then, I alſo obſerve, that they ſet about that work more willingly, which they have been conſulted about, and which, they think, has been undertaken by their advice.

Now, it is the uſual practice of all people that are circumſpect, and they never fail, to revie-wthe ſlaves that are confined in the workhouſe; to examine very narrowly, if they are carefully chained, and whether the places of their confinement are ſtrong and ſecure enough; or whether or not the Bailiff has bound any perſon without the maſter's knowledge, or put him under cloſer confinement: for the Bailiff ought to be exceeding careful of thoſe two things; *viz.* that whomſoever the maſter of the family has inflicted this puniſhment upon, he (the Bailiff) ſhould never releaſe him from his fetters, but by his permiſſion; and whomſoever he has put in bonds by his own authority, he ſhould not looſe him, before the maſter knows it. And the maſter of a family ought to inquire ſo much the more narrowly about this kind of ſervants, leſt they be injuriouſly treated, either as to their apparel, or any other thing allowed them; inaſmuch as they, being ſubject to more perſons, as Bailiffs, Directors, and Overſeers of the works, and Keepers of the priſon and workhouſe, are more liable to ſuffer injuries; and, on the other hand, are more to be dreaded, when they are hurt either by cruelty or avarice. Therefore let a diligent maſter inquire both of themſelves, and alſo of the other ſervants that are not in bonds, who are moſt to be credited, whether they receive all their juſt dues, according to his appointment; and let him examine into the goodneſs of the bread and drink, by taſting them himſelf, and review and examine into their cloathing, mittens, and ſhoes; and let him often give them liberty and opportunity to complain of thoſe, who either uſe them barbarouſly, or cheat and deceive them. We indeed are as careful to do juſtice to, and avenge thoſe, who complain with any appearance of juſtice, as to correct and puniſh thoſe, who raiſe ſeditions and uproars among the ſervants, and calumniate their Overſeers and Directors;

and, on the other hand, we beſtow rewards upon thoſe, who behave themſelves with activity and diligence.

To women alſo, who have been more fruitful than ordinary, who, for a certain number of children, ought to be honoured and reſpected, we have ſometimes given reſt from labour, and alſo their liberty, when they had educated and brought up many ſons; for ſhe, that had three ſons, was exempted from labour; and ſhe, that had more, obtained her liberty alſo. For this juſtice and care of a maſter of a family contributes much to increaſe his eſtate.

But, whenever the maſter of a family returns from the city, let him remember to pay his devotion to his houſhold gods. Then, if it be a proper time, and early in the day, let him preſently, if otherwiſe, the next day, carefully viſit and ſurvey his bounds, and review all the parts of his land, and conſider, whether his abſence has not occaſioned ſome relaxation in the diſcipline and watch; whether any tree, whether any vine, whether any fruits of the ground, are out of their place, and gone. Then let him alſo muſter all his ſervants, and number his cattle, and look over all the tools belonging to the ground, and his houſhold furniture. All which things if he purpoſe and reſolve to do for many years, when old age ſhall come upon him, he ſhall enjoy the advantages of a regular and well-ordered diſcipline; nor ſhall he ever be ſo decrepit or worn out with years, as to be deſpiſed by his ſervants.

CHAP. IX.

Of what Size and Plight of Body the Slaves muſt be, which are to be aſſigned to every particular Work.

WE muſt alſo tell you, to what buſineſs or works we think every particular habit of body and mind proper to be appointed. The ſedulous and moſt frugal you muſt make Overſeers and Maſters of your works; for both theſe qualities contribute more to this buſineſs, than either ſtature or ſtrength of body; becauſe this employment and ſervice is an office of diligent watchfulneſs, and of art. The genius or diſpoſition of the mind, tho' neceſſary in a Herdſman, or in one that labours with oxen, nevertheleſs is not enough, unleſs the hugeneſs of his voice, and the bulk of his body, make him formidable to the cattle. But let clemency moderate his ſtrength, becauſe he ought to be more

terrible

terrible than cruel, that the oxen, not being worn out and consumed with the vexation of labour, and blows at the same time, may both be obedient to his commands, and hold out for more years. But what the offices of Masters and Overseers of the works, and those of Herdsmen, and Labourers with oxen, are, I shall treat of again in their own place. It suffices at present to have taken notice, that, in these, tallness and strength of body is of very great importance, but, in those, of none at all; for, as I said, we should make the tallest of our servants Ploughmen, both for what I have already mentioned, and also because there is no work in Husbandry, wherewith a tall man is less fatigued, because, in plowing, he leans almost erect upon the plough-tail.

A servant for low labour and drudgery may be of any size, provided he be fit for enduring labour. Vineyards don't so much require tall men, as such as are broad and brawny, and have long arms; for this make of body is more convenient for digging, pruning, and other parts of culture relating to them.

Agriculture does not require sobriety and moderation so much in this particular business of vine-dressing, as in other parts of it; because a vine-dresser ought to do his work both in the company of many others, and also under the eye of a monitor. And, for the most part, wicked fellows are of a more quick and active spirit, which the nature and quality of this work requires; for it requires not only one that is robust, but one that is quick, active, and dextrous to attend upon it: therefore vineyards are commonly cultivated by slaves kept in chains. Nevertheless there is nothing that a sober man, of the same nimbleness and activity, will not do better than a rogue. I have inserted this, that nobody may think, that I entertain any such opinion, as to chuse to cultivate the ground rather by malefactors, than by innocent men. But this is what I think, that the business of servants should not be confounded, so that all of them should be put upon doing all things; for that is not at all for the interest of the Husbandman, either because not any one of them believes, that any particular work does properly belong to him; or because, when he has done his utmost endeavours, he believes, that he does not promote his own proper business, but that which is common to all; therefore he slackens his hand, and very much withdraws himself from the labour: nor yet can a fault, which is done by many, be found out to be done by any particular man; for which reason the Ploughmen must be separated from the Vine-dressers, and the Vine-dressers from the Ploughmen, and these from the Drudges.

The classes also, into which you rank your servants, must be made not to consist of more than ten men, which the antients called *decuries*, and

and did moſt approve of, becauſe this determinate number might be moſt conveniently watched over, and obſerved, while they were doing their work, and their multitude not confound the diligence of their Monitor, who leads the way. Therefore, if the land be of a conſiderable breadth, the claſſes muſt be led forth to different quarters, and the work ſo divided, that they may neither be by ones nor by twos; becauſe, when they are diſperſed, they are not eaſily watched over, and kept to their buſineſs. Nevertheleſs there ought not to be above ten together, leſt, on the other hand, when there is too great a number together, each individual may think, that the work does not belong to him. This way of ordering and diſpoſing them not only raiſes emulation, but diſcovers the ſlothful alſo; for whilſt every one is ſtriving to forward the work, then the puniſhment of loiterers is juſt, and ſeems inflicted without murmuring or complaint. But while we are giving precepts and directions to the future Huſbandman concerning ſuch things as he muſt chiefly look after and take care of before-hand, *viz.* the wholſomeneſs, the road, the neighbourhood, the water, the ſituation of the manor-houſe, the extent of the ground, the ſeveral ſorts of tenants and ſervants, the diſtribution of the ſeveral offices and works, by theſe we come now, in due time, to the culture of the ground itſelf; of which we ſhall preſently diſcourſe at great length in the following book.

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK SECOND.

CHAP. I.

That the Earth neither grows old, nor wears out, if it be dunged.

YOU aſk me, *Publius Silvinus*, what I don't refuſe to inform you of without delay; Why, in the very beginning of the firſt book, I immediately confuted the opinion of almoſt all the antients, who have ſpoken of Huſbandry; and rejected, as falſe and erroneous (1), their judgment, who think, that the earth, being wearied and worn out by a long-continued cultivation, and become barren by the filth, naſtineſs, and mouldineſs it has contracted, in a long ſucceſſion of years already paſt, is now become old? I am not ignorant, that you have a great veneration for the authority, both of other illuſtrious writers, and eſpecially for that of *Tremellius*; who, after having, in an elegant and learned manner, written and publiſhed very many precepts of Huſbandry, being certainly carried away and allured by too great a regard for the antients, who treat of the like ſubject, did, without any foundation, believe, that the *earth*, the *parent of all things*, like the female ſex, being now ſpent and worn out with

(1) *Pliny* alſo, in his *natural hiſtory*, confutes the opinion of thoſe, who think, that the earth is become old, and leſs fruitful than formerly; and charges its unfruitfulneſs upon its want of due cultivation, *lib.* xvii. *c.* 5. and in other places.

old

old age, was become unfit for the production of fruits. Which thing I myſelf would alſo acknowledge, if ſhe produced no fruits at all: for a woman is then reckoned to be arrived at barren old age, not when ſhe ceaſes to bring two or three children at a birth, but when ſhe is neither able to conceive or bring forth at all. Therefore, after the days of her youth are paſt and gone, tho' a long life ſtill remains, yet bearing of children, which is denied to years, is not reſtored to her: but, on the contrary, when the earth is abandoned, and left deſtitute of men, either by their own choice, or by ſome accident, yet, when they return to it again, and cultivate it, it pays the Huſbandman with a very large uſury for the time it ceaſed. Therefore the earth's old age is not the cauſe of the ſmall quantity of her fruit, ſeeing that, when once old age has invaded and come upon her, ſhe has no regreſs, no way to recover herſelf, to take heart, and grow young again.

Nor indeed does the wearineſs and faintneſs of the ground diminiſh the fruit that is due to the Huſbandman; for it does not become a wiſe man to be induced to believe, that, as in men *wearineſs* follows upon, and is occaſioned by, too violent exerciſe of the body, or the weight of ſome burden, ſo it is with land, by its being toſſed and tumbled by frequent cultivation. Why is it therefore, ſay you, that *Tremellius* poſitively affirms, that woodlands, which were never tilled, when they are firſt cultivated, bring forth abundantly; but, ſoon afterwards, they don't thus pay the labour of the Huſbandman? He ſees, no doubt, what comes to paſs; but why, it is ſo, he does not throughly underſtand. For land, which has lain long uncultivated, and which, from being all covered over with wood, has been lately reduced into corn-land, ought not therefore to be reckoned the more fruitful, becauſe it has lain untilled, and is younger; but becauſe, being fattened, as it were, with the more plentiful nouriſhment, which it received from the leaves and herbs, which it naturally produced, during the courſe of many years, it has ſtrength enough to bring forth, educate, and bring to perfection, the fruits that grow upon it. But when the roots of the herbs, which are torn up and broken with ſpades and ploughs, and the woods which are cut down with the ax, have left off nouriſhing their *mother* with their leaves, and when ſuch leaves as fell down from ſhrubs and trees in the autumn, and lay upon her, are, preſently after, turned over with the ſock, and mixed with the lower ground, which, for the moſt part, is leaner, and afterwards conſumed, it follows, that the ground, being deprived of its former nouriſhment, grows lean.

It is not therefore from wearineſs, as very many have believed, nor from old age, but indeed from our own ſlothfulneſs, that our cultivated lands

lands don't ſo bountifully anſwer our expectation as formerly; for we might receive a greater product, if the earth were refreſhed and cheriſhed with frequent, ſeaſonable, and moderate ſtercoration: of the culture of which we ſhall now diſcourſe, as we promiſed in the firſt book.

CHAP. II.

Of the ſeveral Kinds of Land.

THEY who had the greateſt ſkill and experience in Huſbandry, O *Silvanus*, have ſaid, That there are three kinds of land (1), *champain*, *hilly*, and *mountainous*. They approved moſt of a *champain*, ſituated not upon a perfectly equal and even plain, nor exactly upon a level, but ſomewhat declining; of a *hill* riſing gently, and by degrees; and of a *mountain* not lofty and rugged, but covered with plenty of wood and graſs. And to each of theſe kinds they aſſign ſix different ſpecies of land; *viz.* that of a fat or lean, looſe or denſe, moiſt or dry ſoil; which qualities, compounded and mixed alternately with one another, make very many varieties of land. To enumerate them, is not the buſineſs of the ingenious Huſbandman; nor indeed is it the buſineſs of any art to wander over all the different ſpecies, which are innumerable; but to begin with generals, which can be eaſily joined together by the thoughts of the mind, and brought within the compaſs of words.

Therefore we muſt have recourſe to certain conjunctions, as it were, of qualities, that are unlike or contrary to one another, which the *Greeks* call συζυγίας ἐναντιοήτων, and we ſhall tolerably well call the *matching*

(1) *Varro*, *lib.* i. *cap.* 6. deſcribes the conveniencies and inconveniencies of theſe three different ſituations of land: 'In champain lands, he ſays, the heat is greater, as in *Apulia*, 'where it is very grievous. Lands that are mountainous, as thoſe of *Veſuvius*, are lighter, 'and ſo more wholſome. They who cultivate low lands, ſuffer greater inconveniency 'in ſummer; but high lands more in winter. Low grounds are both ſown and reaped 'earlier in the ſpring, than thoſe that are high. Some things grow taller and ſtronger upon 'mountains, becauſe of the cold, as firs and oaks, *&c.* Other things thrive beſt below, 'becauſe it is warmer, as the *almond-tree*, and the *Mariſcan fig-tree*. Corn-lands are moſt 'eſteemed upon plains; vineyards upon little hills; and woods upon mountains. They 'who inhabit champains, are beſt accommodated in winter, becauſe then the meadows 'have plenty of graſs, and trees can then be tolerably well pruned. On the contrary, it 'is more convenient living upon mountains in ſummer, becauſe then there is plenty of 'forrage there, when all things are withered and burnt up below; and the culture of trees 'is more commodiouſly performed, becauſe there the air is colder. A champain, which 'tends or declines equably towards one part, is better than that, which lies exactly upon 'a level.' With ſeveral other obſervations too tedious to mention.

or *joining together of discordant things*. And we must also inform you, that, of all the things which the earth brings forth, there are more of them which thrive better upon a champain, than upon a hill, and in a fat soil, than in a lean. As to things growing in soils naturally dry, or well watered, we don't find out, which of them exceed in number, seeing it is certain, that such as delight in dry places are almost infinite, as are also those that delight in moist; but there is not any one of them, that does not grow up better in loose and open ground, than in that which is close and dense; which our countryman *Virgil* also, after he had reckoned up the other commendable qualities of fruitful land, added (2),

> ' A loose and crumbling soil; for, with the plough,
> ' We strive to make it such.'

For to cultivate is no other thing but to open, and loosen, and ferment the earth; therefore the same land, which is both fat, and loose, and crumbling, yields the greatest profits, because, at the time that it yields the most, it requires the least, and what it requires is done with very little labour and expence. Therefore such a soil may very justly be said to be the very best of any.

Then, next to this, is the *fatty-thick dense soil*, which rewards, with great increase, the charges and labour of the farmer. A *place that is well watered* is reckoned in the third rank, because it can yield fruit without any charge. *Cato*, who preferred the product of meadows to all other products of lands whatsoever, called this the best. But we are now speaking of moving and agitating the earth, and not of letting it lie still.

There is no kind reckoned worse, than that which is dry, and likewise dense and lean; because it is both cultivated with difficulty, and, when it is cultivated, it does not so much indeed as thank you: nor does it turn to good account, when you turn it to meadows or pastures. Therefore this land, whether it be tilled, or lies fallow, will always give the Husbandman reason to wish he had never meddled with it, and is to be avoided as if it were pestilential; for *this* brings forth *death*, but *that*, *famine*, death's most frightful and cruel companion, if we give credit to the *Grecian* muses, which cry aloud (3),

> ' With famine to consume and pine away,
> ' And slowly die at last, what wo so great?'

(2) *Virg. Georg. lib.* ii. 204.
(3) *Λιμῷ δ' οἴκτιστον θανέειν καὶ πότμον ἐπισπεῖν.*

But now we ſhall rather take into conſideration that kind of land which is more fruitful, which muſt be conſidered under two different views; *viz. as cultivated*, and *as covered with wood*. We ſhall firſt ſpeak of reducing woodlands into the form of arable ground; becauſe clearing of land is of an older date than the cultivating of it. Let us therefore conſider a place that is not cultivated, whether it be dry or moiſt, full of wood and trees, or rugged and craggy, and full of ſtones; whether it be covered with ruſhes or with graſs, and encumbered with fern-plots, and nurſeries of other ſhrubs. If it be wet, let the abundance of moiſture be firſt drained and dried up by ditches. Of theſe we have known two ſorts, *blind* or *hidden*, and *open*. In thick and chalky grounds they are left open; but, where the ground is more looſe, ſome of them are made open, and others of them are alſo ſhut up and covered; ſo that the gaping mouths of ſuch of them as are blind may empty themſelves into thoſe that are open. But it will be proper, that the open ones be wider towards the upper part, and ſloping and narrow towards the bottom, like ridge-tiles inverted; for ſuch of them, whoſe ſides are perpendicular, are preſently ſpoiled with the water, and filled up with the falling down of the ground that lies uppermoſt.

Moreover, theſe blind works ought to be made by ſinking furrows three feet deep, which, after they are half-filled with ſtones and bare gravel, are made even, by throwing upon them the earth that you digged out of them; but, if you have neither ſtones nor gravel, you muſt make, as it were, a rope of ſprays tied together, of ſuch a thickneſs, as the bottom of the narrow ditch may receive it when it is preſſed together, and, as it were, exactly fitted to it. Then it muſt be ſtretched all along the bottom; and, after treading cypreſs or pine-boughs upon it, or, if theſe cannot be had, any other boughs, let it be covered with earth, having placed at the head and mouth of the ditch two great ſtones only, inſtead of pillars, and one ſingle ſtone above theſe, after the manner of little bridges, that this kind of ſtructure may ſupport the bank, that it may not be ſhut up, and the water hindered either to run into it, or out of it.

There are two ways of managing tracts of land that are covered with wood, ſhrubs, and buſhes, either by extirpating the trees by the very roots, and removing them; or, if they be thin, by cutting them down, and ſetting them on fire, and plowing up the ground. But it is eaſy to clear ſtony ground, by picking up the ſtones; and, if there be a great number of them, ſome parts of the ground muſt be taken up with building them into certain piles, that ſo the other places may be clear of them; or the ſtones muſt be buried in furrows dug very deep: which never-

theleſs is only to be done, in caſe the low wages of the labourers engage you to do it.

The deſtruction of bulruſhes and graſs is *trenching*; and of fern, frequently plucking them up by the roots, which may be done even with the plough; for, when they are often pulled up, within the ſpace of two years they die, and the more ſpeedily alſo, if, at the ſame time, you dung, and ſow with lupines or beans, that, with ſome return and profit, you may cure the diſtemper of the ground; for it is certain, that fern is the moſt eaſily killed by ſowing and dunging: but, if you cut it with a weeding-hook, as it grows up from time to time, which is buſineſs for a very boy, its livelineſs is deſtroyed within the foreſaid time.

But now, after the method of clearing rough uncultivated land, follows the care of lands, that are newly broken up and cultivated; of which I ſhall preſently declare my opinion, after I ſhall have given ſuch precepts and directions to ſuch as deſire to inform themſelves of the nature of corn-lands, as muſt be firſt learned.

I remember, that very many of the antients, who have written of Huſbandry, have declared, that the peculiar *ſweetneſs* of the ground, the *abundance of herbs and trees, and the fruit*, they produced, and its *black or aſhy colour*, were, as it were, acknowledged unconteſted and undoubted ſigns of land that was fat, and would bear corns in abundance. As to the reſt, I am doubtful; but, as to the *colour*, I cannot enough admire, that both other writers, and alſo *Cornelius Celſus*, a man not only well acquainted with Huſbandry, but alſo with univerſal nature, ſhould have been ſo much miſtaken, both in their judgment, and alſo in their eye-ſight, that ſo many marſhes, and ſo many fields alſo full of ſalt-pits, which, for the moſt part, are of the foreſaid colours, did not occur to them: for we ſcarcely ſee a place, which is not either of a black or aſhy colour, provided it contain any water that moves ſlowly; unleſs I myſelf perhaps am deceived in this, that I don't think, that exceeding good corn can grow or thrive well either in a marſhy or ſlimy, or in a bitter and ouſy ſoil, or in plains lying upon the ſea-ſide, which are full of ſalt-pits. But this error of the antients is too manifeſt to want to be confuted by many arguments.

The colour therefore is no certain authority, nor ſure evidence, of the goodneſs of arable lands; and therefore *corn-land*, that is, *rich fat land*, muſt rather be judged of by other qualities; for as the ſtrongeſt cattle have different and almoſt innumerable colours, ſo alſo the ſtrongeſt lands have a great number and variety of them. Therefore as we muſt take care, that the ground, which we mark out by its colour for cultivating, be fat, yet this is but of very little importance by itſelf, if it

want

want ſweetneſs; both which we may inform ourſelves of in a manner expeditious enough: for you ſprinkle a very little water upon a clod of it, and knead it with your hand; and if it be glutinous, and if, when preſſed with the gentleſt touch, it ſticks to your fingers, and, as *Virgil* ſays (4),

> 'When handled, clammy grows, and ſticks, like pitch,
> 'Faſt to the fingers;'

And if, when the ſame is thrown againſt the ground, it does not crumble, and fall into ſmall bits, this tells us, that, in ſuch matter, there is a natural inherent juice and fatneſs; but alſo, if after having thrown the earth out of ſome trenches, you would replace and put it up very cloſe, and tread it down again, when, with ſome kind of ferment, as it were, there is more than enough of it for filling up the trench, it will be a certain ſign, that it is fat; and when there is not enough, but ſomewhat wanting, we may be ſure, that it is poor and lean; and, when it exactly fills them, that it is middling: tho' theſe things I have now mentioned may poſſibly ſeem not to be ſo true ſigns, as if the earth were ſomewhat of a blackiſh colour, which is beſt tried and approved by the increaſe of the fruits it produces.

We ſhall alſo know it by its taſte, if out of that part of the land, which diſpleaſes us moſt, there be clods dug, and ſoaked in an earthen veſſel, and thoroughly mixed with ſweet water, and carefully ſtrained, in the manner of dreggy wine, and then carefully examined by the taſte; for whatever taſte the water ſhall have, which it has derived from the clods, ſuch we ſhall ſay the ground has.

But, beſides this experiment, there are many things, which may ſhew, that the earth is both ſweet, and fit for corn, as *the ruſh*, *the reed*, *graſs*, *the dwarf-elder*, *bramble-buſhes*, *wild plum-trees*, and many other things, which are alſo known to them that ſearch for water, and are not nouriſhed but by the ſweet veins of the earth. Nor muſt we be contented with the appearance of the ſurface of the earth, but carefully ſearch to find out the quality of the matter that lies below, whether it be earthy, or not. But it will be ſufficient for corns, if the ground below be equally good two feet deep. The depth of four feet is abundantly enough for trees.

When we have thus carefully examined and made experiments upon theſe things, we muſt prepare the land for ſowing the ſeed. And the land yields no ſmall increaſe, if it be carefully and ſkilfully manured:

(4) *Virg. Georg. lib.* i. 250.

where-

wherefore almoſt all the moſt antient writers have written of, and deſcribed, the form or method of this work, which Huſbandmen might follow as *maxims*, and as a law, in tilling their lands.

It is therefore proper, that, when the oxen are at work, they be yoked cloſe to one another, that they may go the more gracefully, with a lofty air, and their heads elate; and that their necks may be the leſs weakened, and the yoke be fitted to, and ſit the better upon, their necks (5); for this way of yoking is moſt approved: for that which is in uſe in ſome provinces, of faſtening the yoke to their horns, is rejected almoſt by all, who have written any precepts or directions for Huſbandmen. Nor is it without reaſon; for the cattle can exert themſelves, and uſe greater efforts, with their necks and breaſts, than with their horns; and, by this method, they tug and ſtrain with the whole bulk and weight of their body; but, by that, they are put to great torment, by pulling back their heads, and turning their faces exactly upward; and, with a very light plough-ſhare, they ſcarcely wound the uppermoſt part of the earth: and therefore they till the ground with ſmaller ploughs, which are not ſtrong enough to rip up the fallow grounds or lay-lands (6), which are plowed very deep; and, when they are thus plowed, it is a great advantage to every green thing that grows upon them: for, when corn-lands are throughly plowed with a deep furrow, both the corns and the fruits of trees grow the larger, and they yield a greater increaſe. Therefore I differ from *Celſus*, who, fearing the expence, which is greater in oxen of a larger ſize, adviſes to manure the land with ſmall plough-ſhares and coulters, that ſo it may be performed with oxen of a ſmaller ſize; not knowing, that there is a greater revenue from the great plenty of the fruits of the ground, than the charges of purchaſing greater cattle can amount to, eſpecially in *Italy*, where the land, being planted with trees for ſupporting of vines, and with olives, requires to be opened and tilled deeper, that

(5) It ſeems the diſpute about placing the yoke upon oxen, whether it be beſt to fix it upon their head or their neck, is not yet determined, ſeeing, in different parts of *Italy*, at preſent, they uſe it both ways, tho' what our author ſays againſt fixing it to their horns ſeems very reaſonable; and one may eaſily obſerve, that oxen labour more when they draw with their heads, than with their necks. It ſeems, in *Epirus* they faſtened them to their horns; for *Callimachus* calls the oxen κεραλκεῖς, becauſe, ſays the ſcholiaſt, they draw the plough with their horns.

(6) *Novalia*, *novalium*, or *novalis ager*, which I tranſlate fallow-grounds or lay-lands, properly ſignifies land that has never before been tilled or cultivated. *Pliny* indeed calls ſometimes *novalis ager*, that which was ſown every other year; he alſo calls by the ſame name land, from off which old wood has been cut. But moſt authors mean, by *ager novalis*, land which reſts one year, and is ſown the other. *Iſidorus* ſays, that it both ſignifies land tilled for the firſt time, and alſo that which reſts every other year, in order to renew its ſtrength.

ſo

ſo the uppermoſt roots of the vines and olives may be cut with the plough-ſhare; which, if they remain in the ground, are hurtful to the fruits of it; and that the lower roots, when the ground is throughly manured, and plowed very deep, may more eaſily receive nouriſhment from the moiſture.

Nevertheleſs that method of *Celſus*'s may be very proper and fit for *Numidia* and *Egypt*, where, for the moſt part, the ground, being void of trees, is ſown with corns; and it is ſufficient, that this ſort of land, which is of a light, looſe, and crumbling mould, with fat ſands, as it were, looſe aſhes, be moved with the lighteſt plough-ſhare. But the ploughman, who governs the oxen, muſt walk upon the plowed ground, and, at every other turning, hold the plough obliquely, and, by turns, to furrow with a ſtrait and full plough, ſo as not to leave in any place the ground unplowed and unmoved, which is what Huſbandmen call a *balk*.

When the oxen come to a tree, he muſt keep them in ſtrongly, and make them ſtep ſlowly, leſt the plough-ſhare, being driven with greater force againſt the root, give a ſhock to their necks, or leſt the ox ſtrike with great violence with his horn againſt the ſtock of the tree, or lightly touch the trunk with the extremity of the yoke, or break off a branch. Let him rather terrify them with his voice, than with blows; and let ſtrokes be the laſt remedies when they refuſe their work. Let him never provoke a ſteer with the goad; for it makes him pull back, and gives him a cuſtom of kicking. Nevertheleſs let him ſometimes put him in mind with his whip. Neither let him ſtop half-way before he come to the turning; but let him give them a little reſt at the end of the furrow, that ſo the ox, in hopes of reſting, may, with greater agility, pull the whole length. But to draw a longer furrow than one hundred and twenty feet, is hurtful to the cattle; for, when it exceeds this meaſure, they are fatigued more than they ought to be.

When they are come to the turning, let him puſh the yoke forward, and hold in the oxen, that their necks may cool, which quickly contract a burning heat (unleſs they are conſtantly cooled); and from this ariſes a ſwelling, and then ulcers. Let the Ploughman make no leſs uſe of a chip-ax than of the plough-ſhare; and let him ſearch after, and dig up, all the broken ſtumps and uppermoſt roots, wherewith land, planted with trees for ſupporting vines, is always peſtered and embaraſſed.

CHAP.

CHAP. III.

Of the Care that is to be taken of Oxen, when they are unyoked.

AS ſoon as the Ploughman has unyoked the oxen from their work, let him rub them down while they are girt, and preſs their back ſtrongly with his hands, and pull their ſkin once and again, and not ſuffer it to ſtick faſt to their body; for this kind of diſeaſe is very hurtful to oxen. Let him rub their necks ſtrongly, and pour pure wine into their jaws, if they be extremely hot. It is enough to give two *ſextarii* to each of them. But it is not proper to ty the oxen to their cribs, till they have left off ſweating and panting. Then, when it is due time to feed them, it is not proper to give them much food, nor their whole portion, but in parts, and little by little; which when they have eaten up, they muſt be led out to water, and inticed to drink by whiſtling, that they may drink the more willingly: and, when they are brought back, they muſt be ſatiated with a larger allowance of fodder. What has hitherto been ſaid of the office of a Ploughman, who has oxen under his care, is ſufficient. Our next buſineſs is to give directions alſo about the proper ſeaſons for manuring all ſorts of corn-lands.

CHAP. IV.

Of the Time of the Year when, and how Lands muſt be plowed.

FAT champain lands, which contain water the longeſt, muſt be tilled, for the firſt time, when the ſeaſon of the year begins to grow warm, after they have brought forth all their herbs, and their ſeeds are not yet come to maturity; but they muſt be plowed with ſo numerous, thick, and cloſe furrows, that it may ſcarcely be diſcerned which way the Plough-ſhare was drawn: for thus all the roots of the herbs are torn up, and killed. But let (1) fallow-land be ſo reduced into

(1) *Vervactum* ſeems to ſignify the very ſame as *ager novalis*, land newly broken up, or fallow-land, and as our author in this 4th chapter, no doubt, underſtands it, when he orders it to be plowed ſeveral times over, that it may be reduced into duſt; and he oppoſes it to *ager reſtibilis*, which was plowed and ſown every year. The firſt, he ſays, requires double the labour that the ſecond does. *Pliny* ſays indeed, that it is called *vervactum*, from the time of the year it is plowed in, *quaſi vere actum*, i. e. *aratum*.

duſt, by plowing it over and over again, that, when we ſow it, it may require very little or no harrowing at all; for the antient *Romans* ſaid, that *that land was ill manured, which wanted harrowing after the ſeed was ſown.* The Huſbandman ought frequently to examine and try, whether it be rightly plowed or not; and not only with his eyes, which are often deceived, the balks lying hid with the earth ſpread upon them, but let him examine it alſo by feeling it, which is leſs liable to deceit, when a firm and ſtiff pole is applied to, and put through, the croſs furrows. If it has penetrated equally, and without meeting with any reſiſtance, it is manifeſt, that the whole ground ſo far has been moved; but, if any harder part has reſiſted it as it paſſed, it is a demonſtration, that the fallow-ground is not yet plowed up. When the ploughmen ſee this frequently done, they dare not be guilty of making balks: therefore wet champain lands ought to be tilled after the 13th of *April.* When they have been tilled about this time, you muſt let the days about the time of the ſolſtice intervene, which is about the 23d or the 24th of *June*; and then they muſt be plowed a ſecond time, and then a third time about the beginning of *September*; for all that have ſkill in Huſbandry agree, that, from the ſummer ſolſtice till that time, it is not proper to plow, unleſs the earth be throughly wet with ſudden and unexpected ſhowers, like winter-rains, as it ſometimes happens. And, when this really happens, there is nothing to hinder, why fallow-lands, that have been plowed in the ſpring, may not be manured in the month of *July.*

But whenever land is plowed, we muſt obſerve never to touch it when it is miry and dirty, nor when it is half-wet with ſmall ſhowers; which ſort of land peaſants call various or ſpeckled, and carious (2): and it is ſuch, when, after long droughts, a light rain has only wet the upper part of the clods, but has not reached to the under part. For ſuch corn-lands as are plowed when full of ſlime and dirt, are not in a condition to be handled the whole year after; and, in ſeed-time, are neither fit for ſowing nor harrowing: but, on the other hand, ſuch as are plowed when they are various or ſpeckled, continue barren for three

(2) *Terra varia & carioſa. Cato* ſays, *Beware you ſtir ſpeckled and carious land either with cart or cattle. Pliny*, in his *nat. hiſt.* explains this ſhort expreſſion very elegan ly and fully thus: *What*, ſays he, *can be meant by this ſhort phraſe*, carious ground, *which* Cato *ſeems to be ſo much afraid of, as to forbid us almoſt to tread upon it? Let us compare it with the rottenneſs of wood, and we ſhall find in it thoſe defects, which he ſo much abhors, dry, fiſtulous, or ſpongy, ruſty, rugged, hoary, eaten, conſumed, and full of holes, like a pumice-ſtone.* Cato *ſaid more in one word, than can be expreſſed by the moſt copious language; for hereby are ſignified certain imperfections of the ſoil, proceeding not from old age, which cannot be attributed to the earth, but from its own nature; and therefore it is weak and unfruitful, and unfit for every thing.*

whole years. Therefore, in lands that muſt be plowed, let us chiefly follow a middle temperament, that they may neither want juice, nor abound in moiſture; becauſe too much moiſture, as I ſaid, makes them ſlimy and miry, and ſuch as are dried up with droughts cannot be rightly managed; for, either by the hardneſs of the ground, the plough-ſhare is rejected and thrown out, or, if it has penetrated in any part, it does not cleave the ground into ſmall clods, but pulls it up in great turfs; which lying in the way, the land is ſo entangled, that it cannot be ſo rightly plowed a ſecond time as it ought to be; becauſe, by the weight of theſe turfs, the plough-ſhare is thruſt out of the furrow, as if ſome ſolid thing, ſunk deep into the earth, did ſtand in its way; whereby it comes to paſs, that balks are alſo made when it is plowed a ſecond time; and the oxen are very much hurt by the ruggedneſs and grievouſneſs of the work.

Moreover we may here add, that all ground whatſoever, tho' exceeding rich, nevertheleſs has its lower part poorer and hungrier; and when great ſods are raiſed, they pull up the poor ground; whereby it comes to paſs, that the more unfruitful matter, being mixed with that which is fatter, makes the crop of corn the leſs plentiful; alſo the expences of the Huſbandman are much heightened by the ſlow progreſs that his work makes: for the uſual taſks cannot be performed when the ground is become hard. Therefore, in drought, I adviſe, that what is already plowed be plowed a ſecond time; and that rain be expected and waited for, which, by moiſtening the earth, may make its culture eaſy to us. But a *jugerum* of ſuch land is diſpatched by one labourer in four days; for it is eaſily tilled at firſt with two days labour, and plowed a ſecond time with one, and a third time with three fourths of a day; and, with the fourth part of a day's labour, it is ſown, and reduced into ridges. Huſbandmen call them *ridges*, when the ground is ſo plowed, as that the accumulated part between two furrows, at ſome tolerable diſtance the one from the other, may afford a dry ſeat for the corns.

Harrowing not uſed.

Hilly ground, where the ſoil is fat, muſt be tilled, for the firſt time, in the month of *March*, after the trimeſtrian ſowing (3) is finiſhed; but preſently in *February*, if the warmneſs of the climate, and the drineſs of the country, adviſe you to it. Then they muſt be plowed a ſecond time from the middle of *April* till the ſolſtice; and for the third time in the month of *September*, about the equinox. And a *jugerum* of ſuch land is throughly cultivated with the ſame number of days labour

(3) *Trimeſtrian ſowing* is of that ſort of wheat, or other grain, which grows up, ripens, and is cut down about three months after it is ſown. It is ſown in the ſpring, where froſts and ſnows begin very early. This kind of wheat is common among the *Alps*.

as

as wet and ouſy champain lands. But, in plowing, it muſt eſpecially be obſerved, that the furrow be always drawn croſs the hill; for, by this method, the difficulty ariſing from the acclivity of the ground is ſurmounted and broken, and the labour both of men and cattle is moſt commodiouſly leſſened. Nevertheleſs, as often as we plow it a ſecond time, the furrow muſt be drawn oblique, ſometimes a little toward the higher, and ſometimes toward the lower parts of the hill; ſo that we may plow it the ſecond time toward both parts, and not labour the ground always in the ſame track.

Let poor lean land, which lies upon a level, and abounds in water, be firſt tilled about the latter end of the month of *Auguſt*, and then plowed a ſecond time in *September*, and made ready for ſowing about the equinox. But this kind of ground is more expeditiouſly laboured than any other; and therefore fewer days labour are beſtowed upon it: for three are ſufficient for one *jugerum*. Alſo ſlender, meagre, riſing ground muſt not be plowed in ſummer, but about the firſt of *September*; becauſe, if it is cut up before that time, it becomes barren, and loſes its juice, and is burnt up with the ſummer ſun, and has no ſtrength remaining in it: therefore it is beſt to till it, for the firſt time, between the firſt and the thirteenth day of *September*, and ſoon afterward to plow it a ſecond time, that it may be in a condition to be ſown when the firſt rains fall about the time of the equinox. Nor in ſuch land muſt the ſeed be ſown on the ridges, but in the furrows.

CHAP. V.

Of the manner of dunging lean thin Land.

NEVERTHELESS it will be proper to dung lean thin land before we plow it a ſecond time; for, by this kind of nouriſhment, as it were, it gathers ſtrength. In champain lands the heaps of dung muſt be laid thinner, and on hills thicker, and they muſt be about five *modii* each; and, upon a plain, it will be ſufficient to leave an interval of eight feet between them every way; but, upon declining ground, two feet leſs. (But we are of opinion, that this ſhould be done when the moon is declining; for this thing frees the corns from weeds. \But a *jugerum* of land, which is dunged thicker, requires twenty-four loads (1), and that

(1) *Vehes ſtercoris*, a load of dung, *Columella* ſays, contains eighty *modii*, *lib.* xi. *cap.* 2. Each *modius* contained ſixteen *ſextarii*, and a *ſextarius* is ſuppoſed to contain twenty ounces

that which is thinner eighteen. It is proper, that the dung, after it is ſpread, be preſently plowed in, and covered with earth, that it may not loſe its ſtrength by the exhalation of the ſun; and that the ground, being mixed with it, may grow fat with the foreſaid nouriſhment: therefore, when the heaps of dung are laid in order upon the land, a greater number of them ought not to be ſcattered, than the ploughmen are able to plow down and put under ground the ſame day.

CHAP VI.

Of the ſeveral Sorts of Seeds.

FORASMUCH as we have taught you to prepare the earth for the ſeed-time, we ſhall now treat of the ſeveral ſorts of ſeeds. The chief and the moſt profitable corns for men are common wheat (1), and bearded

of rain-water; ſo that a *modius* contained about three hundred and twenty ounces, or twenty-ſix *Roman* pounds eight ounces of rain-water: by which computation we may judge of the capacity of a *modius*, wherewith they meaſured their dung. The learned Dr. *Arbuthnot*, who has carefully examined the *Roman* meaſures, both liquid and dry, ſays, that the *modius* was equal to 1 peck 7 ſolid inches and $\frac{21}{125}$ parts of an inch, or in other words, 1.0141 peck *Engliſh* meaſure.

(1) *Triticum*, common bare wheat, which has very little huſk upon it, was, according to *Varro*, a name given formerly to all ſorts of grain beaten or bruiſed out of ears by trituration or threſhing; but afterwards it was given to a peculiar ſpecies of grain, of which there are many ſorts, which take their name from the places where they grow; as *African*, *Pontic*, *Aſſyrian*, *Thracian*, *Egyptian*, *Sicilian*, &c. which differ from one another in colour, bigneſs, and other properties, too tedious to relate. One ſort has its ears without beards, and is either of winter or ſummer. Another ſort is armed with long beards, and grows up ſometimes with one, ſometimes with more ears. Of theſe the grains are of different ſorts: ſome of them are white, ſome reddiſh, ſome round, others oblong, ſome large, others ſmall. Some ſorts are early ripe, others late in ripening; ſome yield a great increaſe, ſome are hungry, and yield little; ſome put forth a great ear, others a ſmall. One ſort ſtays long in the hoſe (*folliculo*); another frees itſelf very ſoon out of it. Some have a ſmall ſtalk or ſtraw; others have a thick one, as the *African*. Some are cloathed with few coats, ſome with many, as the *Thracian*. Some grains put forth only one ſtalk, ſome many ſtalks. Some require more, ſome leſs time to bring them to maturity. For which reaſon ſome are called *trimeſtrian*, ſome *bimeſtrian*; and they ſay, that, in *Eubœa*, there is a ſort, which may be brought to perfection in forty days; but moſt of theſe ſorts, which ripen in a ſhort time, are light, unfruitful, and yield very little, tho' they are ſweet and agreeable to the taſte, and of eaſy digeſtion. *Theophraſtus* adds, that the wheat of *Pontus* was the lighteſt, and the *Sicilian* the heavieſt, of any brought into *Greece*; but ſays, that that of *Bœotia* was heavier; and that the *athletæ* could not eat ſo much of it as of that of *Attica*. The cauſe of all theſe differences, he ſays, is in the climate, and the ſoil. *Pliny*, *hiſt. nat. lib.* xviii. *c.* 7. prefers the *Italian* wheat to all theſe; and ſays, that none is to be compared to it in whiteneſs and weight, by which it is moſt diſtinguiſhed; and that foreign wheat was only to be compared to that, which grows in mountainous

bearded wheat (2). We have known ſeveral kinds of common wheat; but of theſe we muſt chiefly ſow what is called the *red wheat*, becauſe it excels both in weight, and in brightneſs. The white wheat muſt be placed in the ſecond rank, of which the beſt ſort in bread is deficient in weight. The trimeſtrian ſhall be the third, which Huſbandmen are mighty glad to make uſe of; for when, by reaſon of great rains, or any other cauſe, the early ſowing has been omitted, they have recourſe to this for their relief (It is a kind of white (3) wheat). The other ſorts of wheat are altogether ſuperfluous, unleſs any man has a mind to indulge a manifold variety, and a vain-glorious fancy. But, of bearded wheat, we have commonly ſeen four ſorts in uſe; *viz.* that which is called *Cluſinian* (4), of a ſhining, bright, white colour; a bearded wheat,

tainous places in *Italy*. And that this was the common opinion of *Greece* above 140 years before the time of *Alexander the Great*, he proves from *Sophocles's Triptolemus*, where he calls *Italy fortunatam frumento candido*, fortunate for its white corn; and he ſays, that, in ſome parts of *Italy*, one plant has been ſeen to bear twenty-four ears; and that, in ſome places, the land is ſo fruitful, that one *modius* has produced a hundred. He ſays, that of all foreign wheat the *Bœotian* was the beſt, next that of *Sicily*, and then the *African*. The *Thracian* was the third for weight, next the *Syrian*, and then the *Egyptian*; and that the lighteſt wheat brought to *Rome* was that of *Gaul*, and of the *Cherſoneſus*, not exceeding 20 pounds the *modius*, which amounted to 240 *Roman* ounces, *i. e.* 18 pounds 2½ ounces *Troy* weight, the *Engliſh* peck; that the *Sardum* wheat (I ſuppoſe he means *Sardinian*) weighed half a pound more; the *Alexandrian* and *Sicilian modius* weighed 20 pounds 10 ounces; the *Bœotian* 21 pounds; the *African* 21 pounds 9 ounces, all *Roman* weight, weighing only the pure grain. According to the weight of the wheat was the quantity of bread made out of it; and that it is a ſettled thing, that a *modius* of any wheat whatſoever, made into ammunition-bread, weighs always one third more than the grain; and that that is the beſt corn, which takes a *congius*, or ten pound weight, of water to knead it.

(2) *Adoreum far*. *Columella* ſometimes mentions theſe two words conjunctly, ſometimes ſeparately; and, when ſeparately, he uſes them as ſynonymous. Authors do not agree what particular ſort of corn this *far* ſignifies; but it appears probable, that it was a kind of husked bearded wheat. The antients called it *adoreum*, becauſe they uſed it in ſome ſacred ceremonies. Our author aſſigns this as a difference between the *adoreum* and the *triticum*, that the firſt has a firm and durable huſk, and will bear moiſture a long time, without ſuſtaining any hurt; and, *cap.* 9. of this book, he ſays, that a *jugerum* of land requires almoſt double the quantity of *adoreum* more than it does of *triticum*.

(3) *Siligo*. *Pliny* ſays, that this is the moſt delicious and the daintieſt of any ſort of wheat, exceeding white, but without much ſubſtance or ſtrength, only proper for moiſt tracts of land, ſuch as thoſe of *Italy*, and ſome parts of *Gaul*; that it never ripens equally; and that there is no ſort of corn that ſuffers delay leſs, becauſe it is ſo tender, that ſuch ears of it as are ripe preſently ſhed their grains; but, in the ſtalk, it is in leſs danger than any other corn; for it holds its ear always upright, and does not contain the dews, which occaſion blaſting and mildew.

(4) *Far Cluſinum*, ſtrong bearded wheat, which grew about *Cluſium*, a very antient town in *Tuſcany*, now called *Chiuſi*. It was one of the firſt *Tuſcan* colonies, and the ſeat of king *Porſenna*, who ſided with *Tarquinius Superbus* againſt the *Romans*. It is about twenty miles from *Perugia*, and ten from the lake *Traſimenus*. It is very little inhabited now, becauſe of the badneſs of the air. *Pliny* ſays, that he has known a *modius* of this ſort of corn weigh twenty-ſix pounds.

which

which is called *venuculum* (5). One ſort of it is of a firy red colour, and another ſort of it is white; but they are both heavier than the *Cluſinian*. The *trimeſtrian ſeed*, or that of three months growth, which is called *halicaſtrum* (6); and this is the chief both for its weight and goodneſs. But theſe ſorts, both of ordinary common wheat, and of bearded wheat, muſt, for this reaſon, be kept by Huſbandmen, becauſe it rarely happens, that any land is ſo ſituated, that we can content ourſelves with one ſort of ſeed, ſome part of it happening, contrary to our expectation, to be either wet or dry. But common ordinary wheat thrives beſt in a dry place; and bearded wheat is leſs infeſted by moiſture.

CHAP. VII.

Of the ſeveral Sorts of Pulſe.

AS there are very many ſorts of pulſe or legumes, the moſt acceptable, and thoſe which we ſee men make moſt uſe of, are *beans*, *lentils*, *peaſe*, *kidney-beans*, *tares*, *hemp-ſeed*, *millet*, *panic*, *ſeſam*, *lupins*, *linſeed* alſo, and *barley*, becauſe ptiſan is made of it. Alſo the beſt of fodder for cattle are clover-graſs, fenugreek, and vetches. Then next to theſe are chichlings and bitter vetches, and forrage which is of barley (1). But we ſhall firſt treat of thoſe which are ſown upon our own

(5) It is very difficult to determine what the author means by *far venuculum*. In the xith book, *cap.* 2. he calls it *far vernaculum*, true *Italian* bearded wheat. He makes mention of a *vitis venucula* or *veuicula*, which ſome call *venuncula*, from *Venuſia* a town in *Apulia*. But it is ſtrange, that it is not rather called *far Venuſinum*, if he meant corn growing near this place. No doubt he intended to expreſs a kind of wheat peculiar to ſome place or other, not eaſy now to determine.

(6) *Trimeſtrian ſeed*, called *halicaſtrum*. I don't find in *Pliny*, or any other author in my hands, why this ſeed of three months growth is called *halicaſtrum*. Perhaps it may be ſo called, becauſe of this ſort of wheat they made that gruel or ſupping-ſtuff they called *alica*, and that it ought to be written *alicaſtrum*, without any aſpiration. They made this *alica* of *zeia*, which is the ſame with *far*, which I ſuppoſe to be bearded and husked wheat. *Pliny*, *lib.* xviii. *cap.* 5. mentions *alica* as a ſort of grain proper to be ſown in the ſpring; and, both in that place, and *lib.* xxii. *ſect.* 16. *edit. Pariſ.* by *Hardouin*, he takes it for that ſort of grain, of which they made the gruel they called *alica*; which word ſeems to ſignify both that liquor, and the wheat of which it was made; and it ſeems to be ſo taken by *Cato*, *cap.* 76.

(1) *Farrago* ſeems to be derived from *far*. *Feſtus* ſays, that fodder for cattle, of ſeveral ſorts of corn, cut for that purpoſe, was ſo called, as wheat, barley, tares, *&c.* Probably this ſort of food was called *farrago*, becauſe the *far*, or husked bearded wheat, was the chief ingredient in this mixture of ſeveral ſorts of green corn. Sometimes it is called

own account, being mindful of that moſt antient precept, which adviſes us to ſow laſt in cold places, ſooner in warm, and ſooneſt of all in ſuch as are hot. But now we ſhall give directions, as if it were for a temperate climate.

CHAP. VIII.

Of the proper Time for ſowing.

OUR poet is of opinion, that bearded wheat, as alſo other common wheat, ought not to be ſown before the *pleiades* (1) ſet; which very thing he expreſſes in numbers thus:

(2) 'If for rich crops of wheat, and ſtrong bread-corn,
'Thou plow'ſt the ground, if corn's thy only care,
'Firſt let king *Atlas*' daughters hide their heads
'At dawning of the morning.'

They are hid from our ſight the thirty-firſt day after the autumnal equinox, which falls almoſt upon the 23d of *September*; by which we ought to underſtand, that the wheat ſeed-time conſiſts of forty-ſix days; *viz.* from the ſetting of the *pleiades*, which happens before the 24th of *October*, to the time when the days are at the ſhorteſt; for ſo prudent Huſbandmen obſerve it as a rule, neither to plow, nor to prune a vine, nor a tree, for fifteen days before the ſhorteſt day falls out, nor for as many days after it is paſt. We alſo are in no manner of doubt, but this is the proper ſeaſon for ſowing our ſeed in land that is temperate, and not all moiſt; but in places that are ouſy, and meagre or cold,

ocymum or *ocimum*, as *Varro* ſays, *lib.* i. *cap.* 31. becauſe it grows up quickly. But probably *ocymum* ſignifies a mixture of green bean-ſtalks, fitches, tares, and ſuch-like, as bear-pods. But *farrago* properly ſignifies a mixture of wheat, barley, and ſuch ſorts of corn as bear ears, and not pods. Both *Columella* and *Pliny* ſay, it may be made of green barley alone. The word, which originally ſignified a mixture of ſeveral ſorts, was afterwards uſed to expreſs one ſort; *viz. farrago ex hordeo*, forrage of green barley. Probably from this word comes the *French* word *fourage*, and the *Engliſh* word *forrage*.

(1) *Pleiades* are the ſeven ſtars in the neck of the conſtellation or ſign *taurus* (the bull). They were called by the *Romans vergiliæ*, becauſe they riſe in the ſpring, about the time of the equinox. The *Greeks* called them *pleiades*, from πλέω, to ſail, becauſe their riſing pointed out the proper time for ſailing in thoſe days. The poets feign them to have been daughters of *Atlas* king of *Mauritania*, a great aſtronomer; and that, being placed in the heavens, they were called *Atlantides*.

(2) *Virg. Georg. lib.* i. 219.

or

or in ſuch only as are not expoſed to the ſun, for the moſt part, it is proper to ſow about the 1ſt of *October* (3),

'While th' earth's dry ſtate and pendent clouds permit;'

that ſo the roots of the corns may grow ſtrong, before they be infeſted with winter-ſhowers, froſts, or hoar-froſts.

But ſuppoſe the ſeed be ſown in due time, yet care muſt be taken to make wide diſtances between the ridges, and frequent water-furrows, which ſome call drains or gutters, and ſo convey all the water out of the corn-lands into drains. Nor am I ignorant, that ſome antient authors have directed, that lands ſhould not be ſowed till the earth be throughly wet with rains, which, I don't doubt, is for the advantage of the Huſbandman, if they come in due time; but if, as it falls out ſometimes, the rains come late, it is right to commit the ſeed to the ground, tho' it be thirſty; and this is alſo practiſed in ſome provinces, where the conſtitution of the climate is ſuch: for ſeed caſt into a dry place, and harrowed in, does not rot, more than if it were laid up in a barn; and, when a ſhower comes, what has been ſown many days before riſes up in one day.

Tremellius indeed affirms, that ſeeds ſown before it has rained plentifully, are conſumed by the fowls and ants, where the land is much dried by abundance of fair weather in ſummer; and this we have often found, and ſtill find, to be true. Nevertheleſs bearded wheat is more fit to be ſown in this ſort of land, than common wheat, becauſe it has a huſk wherein it is contained, which is firm and durable againſt moiſture of any long continuance.

CHAP. IX.

How many Modii *of Seed a* Jugerum *of Land requires; and of the Cure of Seeds.*

A *Jugerum* (1) of fat land requires, for the moſt part, four *modii* (2) of ordinary common wheat; but, of middling land, five. If the ſoil is fertile, it requires nine *modii* of bearded wheat; if it is middling,

(3) *Virg. Georg. lib.* i. 214.

(1) The *jugerum* was the moſt common meaſure of land amongſt the *Romans*. It contained 28 800 *Roman* ſquare feet; and, compared with the *Engliſh* acre, which contains 43,560 ſquare feet, is very near as 10 to 16, as has been ſaid already.

(2) The *modius* was the largeſt common meaſure of capacity for things dry mentioned by

middling, it requires ten: for altho' authors are not fully agreed about the quantity, yet our own experience has taught us, that this quantity ſeems to be what is moſt proper. But, if any one refuſes to conform to this, let him follow the precepts of thoſe, who direct him to ſow upon every *jugerum* of very fertile champain land five *modii* of common wheat, and eight of red-bearded wheat; and they are of opinion, that ſeed muſt be allowed to middling lands in this proportion.

We are not indeed of opinion, that the quantity we have before mentioned ought always to be obſerved; for either the ſtate and condi-

by our author. One may have very nearly an exact idea of the ſize of it, by comparing it with meaſures of capacity for things liquid, whoſe capacities are very exactly adjuſted.

Rhemnus Fannius ſays, it was the third part of the *amphora* or *quadrantal*, which was a meaſure of a cubic form, the dimenſions of the inſide of which was a foot every way; and it was kept in the *Capitol* for a ſtandard, and contained 80 pounds of rain-water; ſo conſequently the *modius* contained 26 pounds 8 ounces of rain-water.

The ſame *Rhemnus Fannius* ſays, that it contained 16 *ſextarii*. The *ſextarius* was the ſixth part of the *congius*, and from this it had its name. It is clear from ſeveral authors, that the *congius*, which was the eighth part of the *amphora*, contained 10 pounds of rain-water: ſo the *ſextarius* contained 20 ounces; and conſequently the *modius* contained 26 pounds 8 ounces, which come to about 24 pounds *Troy* weight: ſo that, if a veſſel were made, containing this weight of clear rain-water, it would ſhew the capacity of the *modius* pretty exactly.

There is another way of gueſſing at the capacity of the *modius*, which may be gathered from *Pliny*, *lib.* xviii. *cap.* 7. where, comparing different ſorts of wheat, he ſays, that a *modius* of *Gallican* wheat weighed about 20 *Roman* pounds, which is in *Engliſh Troy* weight 18 pounds 2 ounces and a half; that a *modius* of *Alexandrian* and *Sicilian* wheat weighed 20 pounds 10 ounces, which make 18 pounds 8 ounces *Troy* weight; with ſeveral other ſorts not needful to be mentioned: ſo that, if a veſſel were made, containing ſuch a weight of the beſt and hardeſt wheat, it muſt come very near the *Roman modius*. But the exact way to determine the capacity of it, is to conſider it as the third part of the *amphora*. The learned Dr. *Arbuthnot* makes it a little more than one peck *Winchester* meaſure.

Here it may be neceſſary to obſerve, how carefully the author adjuſts the quantity of ſeed of different ſorts of grain to be ſown on the *jugerum*, varying it according to the quality of the ground; and, by obſerving the proportion the *jugerum* bears to the *Engliſh* acre, which, as has been often ſaid, is near as 10 to 16, we may know the quantity, which, according to this author, ought to be ſown in an acre of ground. We ſhall mention a few inſtances:

5 *Modii* of wheat - - - - - - -
6 *Modii* of barley of two rows of grains
6 *Modii* of beans - - - - - - -
3 *Modii* of peaſe - - - - - - -
} to the *jugerum*.

Which in *Engliſh* meaſure is

Buſh.	Pecks.		
2	0¼	Wheat	
2	1⅛	Barley	} *per* acre.
2	1⅛	Beans	
1	0¼	Peaſe	

From the foreſaid quantities and proportions one may eaſily know the proportions of the other ſorts of ſeed of different grains mentioned in this chapter.

tion of the place, or of the ſeaſon of the year, or of the climate, makes an alteration in it. The condition of the place *makes it vary*, when we ſow the corn either in plains or upon hills; and theſe either fat, or middling, or lean. The ſtate of the time or ſeaſon varies it, when we ſow our ſeeds in autumn, or when the winter is near at hand; for the former part of the ſeed-time allows us to ſow thinner, but the latter part requires it to be thicker. The ſtate and condition of the climate or weather makes it to vary, when it is either rainy or dry; for that (*i. e.* the rainy) requires the ſame as the former part of the ſeed-time, and this (*i. e.* the dry) as the latter part of it. But all ſorts of corn thrive beſt in open, wide, champain land, declining and ſloping towards the ſun, and expoſed to the heat of the ſame, and of a looſe open ſoil; for hilly ground, tho' it may yield ſomewhat ſtronger wheat, yet not in ſo great quantity. Thick, chalky, and ouſy ground nouriſhes the white winter wheat, and the husky, red, bearded wheat, tolerably well.

Barley does not bear with any place, but what is open, looſe, and dry; and thoſe require the very richeſt land, and that which reſts and is agitated or laboured by turns every other year: this, *viz.* barley, requires no mediocrity; for it is thrown either into the fatteſt or the leaneſt ground. Thoſe, if, after continual ſhowers, if neceſſity requires, you ſcatter them upon ground that is yet ſlimy and wet, will ſupport the injury: this, if you commit it to miry ground, intirely dies. But if the land is tolerably chalky and ouſy, but not to a very great degree, there will be occaſion for a little more of the common wheat, and of the white winter wheat, for ſeed, than five *modii*, as I ſaid before. But if the place be dry, and looſe, and open, and the ſame be either fat, or thin, and lean, four *modii* will be neceſſary (3). For lean ground, for a contrary reaſon, requires the ſame quantity of ſeed; for, unleſs it be ſown very thin, it brings an empty ſmall ear: but when, from one grain of ſeed, many ſtalks ſhoot out, tho' the ſeed be thin ſown, yet the corn will grow up very thick.

Among other things alſo, we ought not to be ignorant, that land, planted with trees for ſupporting vines, requires a fifth part more ſeed, than that which is open, and free from trees. And we are ſtill ſpeaking of the autumnal ſowing; for we reckon this the principal and the beſt.

(3) When the ground is fat, commonly ſeveral ſtalks grow up from one grain; and the reaſon he gives, why no more of this ſeed is to be ſown upon lean ground, is, becauſe, if a greater quantity were ſown, it would not have ſtrength enough to nouriſh all the ſtalks.

But

But there is another or ſecond ſowing, when neceſſity forces. Huſbandmen call it the *trimeſtrian ſowing* (4). This is practiſed to very good purpoſe in very cold and ſnowy places, where the ſummer is wet, and without great heats; but, in other places, it very rarely anſwers: which trimeſtrian ſowing, nevertheleſs, it will be proper to diſpatch and finiſh very quickly, and, without fail, before the Equinox. But, if the condition of the lands, and of the weather, will allow it, the ſooner we ſow, the better it will grow, and the more increaſe we ſhall have; for there is no ſeed by nature trimeſtrian, as ſome have believed, becauſe the ſame ſeed, ſown in winter, anſwers better. But nevertheleſs there are ſome ſeeds better than others, which endure the heats of the ſpring, as *white wheat*, and *Galatian* barley (5), and that kind of husked bearded wheat, which they call *halicaſtrum*, and the grain of the *Mariſcan* bean: for, in temperate climates, the other corns ought always to be ſown before winter.

But ſometimes the earth uſes to vomit up a ſalt and bitter ouſineſs, which, with its continually flowing noxious moiſture, ſpoils and deſtroys the ſtanding-corn, tho' they be almoſt ripe, and makes broad

(4) *Trimeſtrian ſeed* is a ſort of wheat, which they ſow in the ſpring, and which grows up and comes to perfection in three months. *Columella* ſays, that there is no ſeed naturally trimeſtrian. *Pliny* contradicts this, *lib.* xviii. and ſays, that there are ſome ſeeds or ſorts of wheat, which ripen not only in three, but in two months. But, as father *Hardouin* ſays very juſtly, *Columella* does not deny, that there is ſuch a ſeed; but only ſays, that it is not different from that, which, if ſown in autumn, comes up better, and produces more.

(5) *Ordeum Galaticum. Palladius* calls this ſort of barley *grave & candidum*, heavy and white; and adviſes to ſow it in cold places about the firſt of *March*, but in very warm places about the 13th of *January*. Probably it was a corn brought from *Galatia*, a province of the *Leſſer Aſia*, and from thence had its name. This, and the *Phrygian* barley, were much commended for their whiteneſs, and yielding much meal. *Pliny* ſays, that ſome ears had two rows of grains, ſome more, even as far as ſix; and that there were ſome differences in the grains themſelves, ſome longer, ſome ſhorter, ſome rounder, ſome whiter, ſome blacker, and ſome of ſomewhat of a purple colour; that the whiter ſort was the leaſt able to ſupport tempeſtuous weather; that barley was the tendereſt of all corns, and was not fit to be ſown but in looſe and dry ground. That which approaches to a purple colour is reckoned to yield more meal, and is more able to reſiſt all the changes of the weather. See *Theophraſt. hiſt. plant.* and *Plin. lib.* xviii. *c.* 7.

Ordeum cantherinum, horſe-barley. *Cantherius* ſignifies a gelding. Probably this ſort of barley is ſo called, becauſe it is good for horſes, as *Columella* ſeems to inſinuate. But *Matthiolus* upon *Dioſcorides*, *c.* 79. *p.* 321. thinks it is ſo called, *quia folliculo caſtratum enaſcitur*; by which, no doubt, he underſtood, that it came out of its huſe free from husks, or much cleaner than other ſorts of barley; for *Pliny* makes uſe of this word *caſtrare*, in ſeveral places, for cleanſing and freeing the wheat from its husks, as *caſtrata filigo*, &c. And *Matthiolus* adds, that it grows chiefly in *France*; and that they call it there clean barley, *ordeum mundum*, becauſe it falls from its husks of its own accord; whereas the other ſorts are, with difficulty, ſeparated from it: that the whiteſt ſort of barley is the beſt, which is plump, weighty, and is eaſily boiled: and that the *Galatian* is the whiteſt and heavieſt of any, and has two rows of grains.

plots of ground intirely bare, without ſo much as one ſtalk from all the ſeed that was ſown upon it. It is proper, that marks ſhould be ſet upon theſe bare plots, that, at a proper time, we may cure diſeaſes of this kind; for where either this ouſineſs, or any other peſt, intirely kills the corn, there we ought to ſpread pigeons dung, or if this cannot be had, cypreſs-leaves, and then plow them into the ground. But the principal remedy of all is, to make a deep furrow, and thereby drain and convey from thence all the moiſture; otherwiſe the foreſaid remedies will be uſeleſs, and have no effect.

Some cover the ſeed-baſket with the ſkin of an Hyena (6), and ſo ſow the ſeeds out of it, after they have remained in it a little time, not doubting, but what is ſown in this manner will grow up, and come to perfection. Some ſubterraneous peſts alſo kill the corns after they are fully grown up, by conſuming their roots. To prevent this, they uſe, as a remedy, the juice of an herb, mixed with water, which ruſtics call *Houſleek* (7); for they ſow the ſeeds, after ſteeping them one night in this medicament. Some people ſqueeze out the juice of a ſerpentine cucumber (8), and bruiſe the root of it, and dilute the ſame with water; and after having, in the ſame manner, ſoaked the ſeeds therein, commit them to the earth. Others, when the corn begins to be infeſted, ſprinkle the furrows with this ſame water, or with unſalted lees of oil (9), and ſo remove the noxious animals.

I have

(6) *Hyena.* This is a beaſt reſembling a wolf, with a mane, like a horſe's, reaching all along its back. See *Ariſtotle de hiſtoria animalium*, and *Ælian's varia hiſtoria*. *Pliny*, in his viiith book, *cap.* 30. gives a particular account of it, and relates many particulars concerning it, which probably few people will believe till they ſee them. There are many of them in *Phrygia*; but they are more numerous in *Africa*; and they, who want to hear many ſtrange things of them, may conſult the forementioned authors.

(7) *Sedum*, in *Greek* called ἀίζωον, becauſe it lives always, houſleek, or ay-green, grows upon tiles or boards, but beſt upon thatched houſes. Our author, *lib.* xi. ſays, that certain of the antients, as *Democritus*, &c. direct all ſeeds to be medicated with the juice of this herb, and to uſe the ſame as a remedy againſt little beaſts, which deſtroy the roots of the corn; and that he found this to be true by experience. *Pliny* ſays the ſame, *lib.* xviii. *c.* 17.

(8) *Cucumeris anguini*, ſerpentine cucumber. In ſome countries there is a ſort of cucumber, which grows long, and ſomewhat winding like a ſerpent. *Lobelius* calls it *cucumis flexuoſus*, the winding cucumber, ſo called, no doubt, from the ſhape of its fruit. It is alſo called by the *Latins cucumis ſylveſtris*, *erraticus*, and *aſininus*, as *Pliny* ſays; and of the inſpiſſated juice of this they make what they call *elaterium*, in officinal preparations, *humor collectus*, *in ſole ſiccatus*, & *in paſtillos formatus*.

(9) *Amurca inſulſa*, unſalted lees of oil. *Varro*, *de re ruſtica*, *lib.* i. *cap.* 64. calls it *humor aquatilis ex olea expreſſus*, and *humor aquatilis & retrimentum*. It is the watery juice which flows out of the olive-berries, when they are firſt ſqueezed in the preſs, and comes before the oil. He calls it *retrimentum*, the refuſe and off ſcouring of it; and, tho' we call it *dregs*, yet it is really different from the ſediment in the bottom of oil-veſſels,

I have this further direction to give, that, when the corns are cut down, and brought into the threſhing-floor, we ſhould even then think of making proviſion of ſeed for the future ſeed-time; for this is what *Celſus* ſays, where the corn and crop is but ſmall, we muſt pick out all the beſt ears of corn, and of them lay up our ſeed ſeparately by itſelf. On the other hand, when we ſhall have a more plentiful harveſt than ordinary, and a larger grain, whatever part of it we threſh out, muſt be cleanſed with the ſieve; and that part of it, which, becauſe of its bulk and weight, ſubſides, and falls to the bottom of the ſieve, muſt always be reſerved for ſeed; for this is of very great advantage, becauſe, unleſs ſuch care be taken, corns degenerate, tho' more quickly indeed in moiſt places, yet they do ſo alſo in ſuch as are dry. Nor is there any doubt, but that, from a ſtrong ſeed, there may be produced that which is not ſtrong; but that, which at firſt grew up ſmall, it is manifeſt, can never receive ſtrength, and grow large: therefore *Virgil*, as of other things, ſo of this particular concerning ſeeds, has reaſoned excellently, and expreſſed himſelf in this manner:

(10) ' I've ſeen the largeſt ſeeds, tho' view'd with care,
' Degenerate, unleſs th' induſtrious hand
' Did yearly cull the largeſt. Thus all things,
' By fatal doom, grow worſe, and, by degrees,
' Decay, forc'd back to their primevous ſtate.'

But, if we take a grain of wheat of a bright red colour, and cleave it in two, we don't doubt but it is found, if it have the ſame colour inwardly; but that which is whitiſh on the outſide, and inwardly appears very white, ought to be looked upon as light, and without any ſubſtance. Nor let the white wheat deceive us, as if Huſbandmen were to

veſſels, which the word *dregs* commonly ſignifies. The antient Husbandmen made great account of this *amurca*, and uſed it many different ways, as may be ſeen in our author. They put it up in veſſels as carefully as they did oil or wine; they uſed to boil it in two-thirds; and, after it was cold, they put it up in veſſels; they uſed to moiſten and ſeaſon all their oil-veſſels with it, that they might not drink up the oil; they prepared their threſhing-floors with it, in order to drive away the ants, and to keep them from chapping; as alſo their barn-floors, and the plaiſtering of their walls and granaries, they ſprinkled with it; as alſo their wardrobes, to preſerve their cloaths from moths, and other noxious animals; they ſprinkled all their ſeeds with it; and with it they cured their diſeaſed cattle, and trees alſo; they applied it to ulcers in the mouth; they anoimted with it their bridles and ſhoes, and other things made of leather, and of braſs alſo, to preſerve them from ruſt, and to give them a fine colour; they alſo anointed with it all their wooden houſhold furniture, and earthen veſſels, wherein they kept their figs, *&c.* All which, with ſeveral other uſes to which they applied it, may be ſeen in this elegant ruſtic writer.

(10) *Virgil. Georg. lib.* i. 197.

take

take any great pleaſure in it; for it is but common wheat degenerated, and tho' it excels it in whiteneſs, yet it is far inferior to it in weight. But, in a climate of a wet conſtitution, it grows up very well, and brings a good increaſe; and therefore is fitteſt for ſuch places as are well moiſtened with frequent rains. Nor yet need we go far to ſeek it, or be at great pains to find it; for all common wheat whatſoever, after the third ſowing upon ouſy ground, changes into white wheat.

The next in uſe to theſe corns, is that ſort of barley, which the country-people call *barley of ſix rows.* Some alſo call it *horſe-barley*, becauſe it both nouriſhes other animals, which are kept in the country, better than common wheat, and is more wholſome nouriſhment for man, than bad wheat; nor is there any other thing, which, in times of ſcarcity, better ſupplies our wants, and is a greater relief to us, than it. It is ſown in dry and looſe ground, and in that which is either very ſtrong, or thin and lean, becauſe it is evident, that land grows lean and barren by bearing crops of it; for which reaſon it is committed either to the fatteſt land, whoſe exceſſive ſtrength it cannot hurt, or to that which is lean, to which no other thing is committed. If it be committed to fat ground, it ought to be ſown, after it has been twice plowed, almoſt in the middle of the ſeed-time, after the Equinox: if to poor ſlender ground, it ought to be ſown earlier. Five *modii* of ſeed will take up one *jugerum* of ground; and, after it is a little ripe, it ought to be cut down more quickly than any other corn; for, being of a brittle ſtalk, and its grain covered with no chaff, it quickly ſheds; and, for the ſame reaſons, it is more eaſily threſhed than other corns. But, after you have removed the crop it has produced, it is beſt to let the ground lie fallow for one year; if not, to ſatiate it with dung, and drive out all the poiſon that yet remains in the earth.

There is alſo another kind of barley, which ſome call *Galatian*, others barley of two rows. It is of an extraordinary whiteneſs and weight; ſo that, when mixed with wheat, it makes excellent food for a family. It is ſown in the very fatteſt, but cold places, about the month of *March*. Nevertheleſs it anſwers better, if the clemency of the winter allows it, when it is ſown about the 13th of *January*. A *jugerum* of land requires ſix *modii* of it.

Panic alſo and millet (11) muſt be ranked among corns, tho' I have already aſſigned them a place, and ranked them with legumes or pulſe; for,

(11) *Milium* bears leaves like thoſe of a reed, with a ſtalk two cubits long, thick, and jointed, and wooly, with a vaſt many roots, with panicles hanging down from the top of it, in which there are a vaſt many grains, ſomewhat roundiſh, ſolid, ſmooth, of a yellowiſh colour, covered with a thin coat. *Feſtus* ſays it is called *milium a milliari ſumma*, as if it conſiſted

for, in many countries, the Peaſants are ſupported with victuals made of them. They require a light, looſe, open ground. They not only grow very well, and bring a good increaſe, in gravelly, but alſo in ſandy ground, provided the climate be moiſt, or the ground be well watered; for they greatly dread that which is dry and chalky. They cannot be ſown before the ſpring, becauſe they thrive beſt, and rejoice moſt, in warm weather. Nevertheleſs they are very ſafely committed to the earth in the latter part of the month of *March*. Nor do they burden the Huſbandman's accounts with great expences; for, with four *ſextarii* of them, they fill a *jugerum* of land. Nevertheleſs they require frequent ſarcling or hoeing, and weeding, that they may be freed from weeds. After they have put forth their ears, before the ſeeds open and gape with the great heats, they gather them by hand, and hang them up in the ſun; and, after they are well dried, they lay them up very cloſe; and, being laid up in this manner, they keep longer without ſpoiling, than other corns. Bread is made of millet, which, before it grows cold, may be eaten without any diſlike. Panic, bruiſed in a mortar, and freed from bran, and millet alſo, in any time of ſcarcity, make a ſoop not at all to be diſliked, eſpecially with milk.

CHAP. X.

Of the proper Soil for every kind of Pulſe.

FORASMUCH as we have now given abundance of precepts relating to corns, let us next diſcourſe of the ſeveral ſorts of pulſe. *Lupines* (1) are firſt to be conſidered, becauſe they require leaſt labour, and

conſiſted of a thouſand grains. *Pliny* ſays, that the locks of the millet, which contain the grains, hang and bend downward, like fringes or hair, looſe and incompact. To this day they make bread of it in *Italy*, which, when hot, is very agreeable.

Panicum is alſo ranked among the corns. It is altogether like millet in its leaf, root, and ſtalk; but differs from it in its panicles, which are a foot long, turning down towards the earth, not ſeparated or divided, but compacted into thick cluſters, conſiſting of hairy or briſtly grains. *Pliny* ſays it is called *panicum*, from its panicles, with their tops bending downward in a languiſhing manner. It putteth forth its fruit grape-wiſe in bunches, without any diviſions or partitions, no otherwiſe defended but by ſmall skins or membranes. The ſtalk groweth ſmaller and ſmaller by degrees, almoſt as hard as wood. Some ſay it is called *panicum*, *quaſi panis vicium*, *quod vice panis fungatur*, becauſe it ſerves inſtead of bread, and men live upon it chiefly when there is a ſcarcity of wheat.

(1) *Lupinus* or *lupinum*. *Pliny* ſays, that they ſow it preſently *ex arvo*, as ſoon as it comes off the ground. Our author ſays *ſtatim ex area*; by which they mean, that it may be ſown preſently after it is gathered in. It is ſown not only for food, but alſo for dunging

and are bought exceeding cheap, and, of all things that are ſown, do moſt good to land; for they furniſh the beſt dung for emaciated vineyards, and for corn-lands alſo, and they thrive well even in barren ground, and, when laid up in the granary, will laſt an age. When boiled and macerated, they nouriſh oxen exceeding well during the winter; and they very ſeaſonably repulſe famine alſo, if men are ſurpriſed with a ſcarcity of corn, and a dearth. They ſow it preſently out of the threſhing-floor; and, of all kinds of pulſe, theſe only require no reſt in the barn; and, either in the month of *September* before the Equinox, or preſently after the firſt of *October*, you may throw them upon unplowed fallow-lands; and, how ſlightly ſoever you cover them with earth, they bear with the Huſbandman's negligence, without receiving any damage. Nevertheleſs they require warm weather in autumn, that they may take root quickly; for, if they have not gathered ſtrength before winter, they ſuffer very much by the colds. What remains of your ſeed, you will lay up beſt in a loft where the ſmoke comes, becauſe, if any moiſture reaches them, they breed worms, and, as ſoon as they have conſumed the little mouths or buds of the lupines, the remaining part cannot ſpring up. They, as I ſaid, love poor lean land, and eſpecially red land, like oker; for they greatly dread chalk, and don't come forth at all in ſlimy or miry ground. Ten *modii* of them take up one *jugerum* of land.

After theſe, it will be proper to commit the kidney-bean (2) to the earth, either in land that has lain fallow, or better in land that is fat,

ing land. It receives no hurt from peſtiferous plants growing near it; for it deſtroys all other noxious weeds whatſoever. *Pliny* adviſes to gather them after it has rained, becauſe, when they are gathered very dry, they ſhed, and fly from the reapers. *Creſcentio*, a *Florentine* writer upon Huſbandry both in *Latin* and *Italian*, ſays, that they ſow them at different times, according to the uſe they make of them. If for dung, they ſow them early in *Auguſt*; after they are grown up, they cut them hard by the ground, throw them into the furrow, ſow corn upon them, and then plow the land over them; and they ſuffice for dung not only for one year, but you may, the next year, ſow corn upon the ſame land without dunging it. He adds, that they may be ſown among panic after the ſecond hoeing; and, after the panic is taken away, they may ſtand to fatten the ground. It is beſt to ſow them in *October* and *November* for a crop of ſeed. They muſt neither be weeded nor hoed; for they themſelves, as has been ſaid, deſtroy all weeds, and, having but one root, the hoe deſtroys them.

(2) *Phaſeolus*, a kidney-bean. The grains reſemble the kidneys of four-footed beaſts. They are very frequent in *Italy*, both in gardens, and in the open fields. *Matthiolus*, who deſcribes the different kinds of them, diſtinguiſhed by their different colours, white, reddiſh, ſpotted, *&c.* ſays, that the grains of the white are leſs than the others, and are ſown in the fields as other pulſe; but the other ſorts are ſown in gardens, and other places, where they want ſhades; for, beſides yielding fruit in due time, they ſhelter from the ſun; for, with their tendrils, they climb up upon cottages, lodges, penthouſes, paliſades, rails, *&c.* and ſpread like a vine, or any other ſpreading vegetable.

and is plowed and ſown every year. A *jugerum* of land requires no more than four *modii* of it.

The ſame method is to be obſerved with reſpect to peaſe (3), which nevertheleſs require an eaſy, looſe, open ground, and a warm place, and a climate where it frequently rains. We may ſow a *jugerum* of land with the ſame quantity of theſe as of kidney-beans, or a *modius* leſs in the very beginning of the ſeed-time after the autumnal equinox.

The fatteſt place, or that which is well dunged, is ſet apart for the bean (4), and if there be any old fallow-ground, of a low ſituation, which receives moiſture from an higher part. Nevertheleſs we will firſt ſow the ſeeds, then till the ground, and, after it is tilled, reduce it into ridges, and harrow it, that they may be covered with a larger quantity of earth, and lie deeper; for this is a very great advantage, that, when the ſeeds ſpring up, their roots may be ſunk very deep in the ground. But, if we muſt make uſe of land that bore a crop of corn this very laſt year, after we have cut down the ſtubble, we will lay twenty-four loads of dung upon one *jugerum*, and ſpread it; and likewiſe when we throw the ſeeds upon unplowed ground, we will plow it in, and, after reducing it into ridges, harrow it; tho' there are ſome who deny, that beans ought to be harrowed in cold places, becauſe the clods, which ſtand up above the ground, ſhelter them, while they are yet young and tender, from the froſts, and afford them ſome warmth, when pinched with cold.

There are ſome alſo who may think, that beans ſupply the place of dung; which I ſo interpret, as to think, that the ground does not grow fat by ſowing them upon it; but that they conſume the ſtrength of the

(3) *Piſum*. *Matthiolus* ſays, that the pea has its name from *Piſa*, the place where formerly they grew very plentifully. It may ſeem ſuperfluous to give any deſcription of a thing ſo well known; but, as many people caſt their eyes upon this, and other beautiful vegetables, without forming any diſtinct idea of them, it may not be amiſs to bid them obſerve, that the pea grows up with a fiſtulous branched ſtalk, with many tendrils or claſpers ſhooting forth from their tops, with numerous longiſh, thick, and flattiſh leaves, with a cylinder-like pod, with a round and white ſeed. It puts forth a flower or bloſſom in the form of a butterfly, about the nevil or middle of a purple colour, ſometimes wholly white, with a weak root. The grains lie cloſe upon one another in the pods. There are ſeveral ſorts of them, which differ in colour, bigneſs, *&c.* Husbandmen commonly ſet branches of trees among the greater ſort to ſupport them. The ſame author ſays, that, in their whole ſubſtance, they have a certain ſimilitude to beans, but differ in two things; *viz.* that they are not ſo flatulent, nor have they any detergent faculty; therefore they do not paſs ſo quickly as beans.

(4) *Faba*, the bean, is the greateſt of all legumes. Some ſow it for fattening the land, and, when it begins to bloſſom, they plow it down; for, being a very juicy plant, when it rots under ground, it fattens it very much. The greater it is, the more it is ſtretched out into length; the leſſer, the rounder it is. For the moſt part, there are only three in a pod, five at the moſt, and that very rarely.

earth leſs than other ſeeds: for I am fully perſuaded, that the land which did bear nothing, is fitter for corns, than that which bore this huſk the preceding year. Four *modii* of beans, as *Tremellius* thinks, and, as we think, ſix *modii*, will take up one *jugerum* of land, if the ſoil be fat; if it be middling, they will take up a little more. And they can neither endure a place that is lean, nor that which is foggy; nevertheleſs they often anſwer very well in thick cloſe ground. A part of them ought to be ſown in the middle of the ſeed-time, and a part in the latter end, which is called the *ſeptimontial ſowing* (5). The early ſowing is more frequently the beſt; ſometimes nevertheleſs the late is better.

It is not very right to ſow them after the winter ſolſtice, and worſt of all in the ſpring, tho' there is alſo a trimeſtrian bean, which grows up and ripens in three months time, which is ſown in the month of *February*; and of this a fifth part more ſeed is requiſite, than of that which is ſown early; but it makes very ſmall ſtraw, and not many pods: therefore I hear old Huſbandmen commonly ſay, that they would rather have the ſtraw of the early-ſown bean, than the whole produce of the trimeſtrian ſowing. But, whatever time of the year it ſhall be ſown in, care muſt be taken, that the quantity we allot for ſeed be only ſown upon the fifteenth day of the moon, if nevertheleſs, upon that day, ſhe ſhall not run over and paſs the direct rays of the ſun, which the *Greeks* call ἀπόκρυσιν (6); if not ſo, then let it be ſown upon the 14th day, while the light is yet upon the increaſe, tho' we ſhould not be able to cover all the ſeed preſently; for it will ſuffer no manner of hurt from the night dews, or from any other cauſes, provided it be defended from the cattle and the fowls. But the antient Huſbandmen, and alſo *Virgil* himſelf, were of opinion, that it ſhould be ſteeped before-hand in lees of oil, or in nitre, and ſo be ſown,

(7) 'That, in the bean's fallacious ſhell, the grain
'Might bigger grow, when o'er a mod'rate fire
'The moiſten'd ſeed is warm'd, but ſoon remov'd.'

(5) The ſeptimontial ſowing was about the time they celebrated the feaſt they called *ſeptimontium*, which was in the month of *December*, a little before the *ſaturnalia*. This feaſt was inſtituted, as ſome think, in remembrance of the ſeventh hill being taken within the incloſures of, and added to, the city, at which time they offered their ſacrifices upon ſeveral, if not all, of the ſeven hills; and then the *Romans* ſent gifts to one another. It was celebrated, not in a polite, but ruſtic manner, as is uſual among villagers and mountaineers, probably in remembrance of their primitive ſimplicity.

(6) Ἀπόκρυσις. When the moon paſſes over the rays of the ſun diametrically oppoſite to her, it is called ἀπόκρυσις τῆς Σελήνης ἀποκρύω, i. e. *repello, repulſo*, as if the moon were driven, as it were, from the ſun, when ſhe begins to grow old or decreaſe.

(7) *Virgil. Georg. lib.* i. 195.

We

We have alſo found by experience, that the bean, being cured after this manner, when brought to maturity, was not ſo much infeſted by the wevil.

Alſo what we are going to ſay further, we lay it down as a precept from our own experience; *viz.* at the change of the moon, pull your beans before day-light. Then, when they are fully dried in the threſhing-floor, before it be full-moon, beat them out of their pods, and, after they are cooled, bring them into the granary. When they are laid up in this manner, they ſhall ſuffer no damage from the wevil. And this, of all other ſorts of pulſe whatſoever, can be the moſt expeditiouſly threſhed without horſes, and cleanſed without wind, in the following manner: Let a ſmall number of bundles be placed looſe at one extremity of the threſhing-floor, the which let three or four men move forward with their feet the whole length of the threſhing-floor, exactly through the middle of it, and beat the ſame with ſticks or little forks. Then, when they are come to the other extremity of the threſhing-floor, let them gather the ſtalks into heaps; for the ſeeds, that are beaten out, will lie upon the threſhing-floor, and upon them the reſt of the bundles will be beaten out by degrees in the ſame manner; and the hardeſt chaff will be removed and ſeparated by the beaters; but the ſmall, which falls with the beans from the pods, and ſettles with them upon the threſhing-floor, will be ſevered from them after another manner: for when the heap, conſiſting of grain and chaff mixed together, ſhall be thrown together into one place, let it be thrown by little and little, with fans, to another place at a good diſtance, by doing which, the chaff, which is lighter, will fall on this ſide; the beans, which will be thrown farther, will come pure and clean to the place whither the winnower ſhall throw them.

It is proper, that the lentil be ſown in the middle of the ſeed-time, when the moon is in her increaſe, till her twelfth day, in a thin, lean, looſe ſoil, or in a fat and dry place eſpecially; for, in the flower, it is eaſily corrupted with luxuriance, or over-rankneſs and moiſture. And, that it may come forth the ſooner, and grow big, they ought to be throughly mixed with dry dung, and ſcattered, after they have reſted ſo four or five days.

We obſerve two different times for ſowing them; the one early, about the middle of the ſeed-time; the other later, in the month of *February*. A little more than a *modius* of them will ſuffice for ſowing a *jugerum* of land. And, that they may not be deſtroyed by the wevils, (for they eat them even when they are in the pods) care muſt be taken, that, after they are threſhed out, they be put into water, and that the

about the beginning of October

firm and ſound be ſeparated from that which is empty, which preſently ſwims above. Then let them be dried in the ſun, and ſprinkled with the root of *ſilphium* (8), bruiſed with vinegar, and let them be well rubbed; and ſo, after they are dried in the ſun a ſecond time, and then cooled, let them be laid up, if there be a greater quantity of them, in a barn, if a leſſer quantity, in oil jars, or any other veſſels, wherein ſalt-fiſh or fleſh have been kept; which being filled therewith, when they are preſently covered with plaiſter, whenever we ſhall bring them forth to uſe, we ſhall find the lentils ſound. They may alſo, without being cured after this manner, be preſerved very well, if they be mixed with aſhes.

Linſeed (9) muſt not be ſown, unleſs it brings a great increaſe, in that country where you cultivate it, and the price it bears invites you; for,

(8) *Silphium*. *Columella* ſays, *lib.* vi. *cap.* 17. that the root, which the *Greeks* call *ſilphium*, was commonly called *laſerpitium* in his time. *Pliny* ſays, that it was found in the province of *Cyrene*; that they called the juice of it *laſer*; that it was of mighty eſteem in phyſic, and ſold for its weight in ſilver; but that, for many years, it had not been found there, becauſe all the ſtalks of it, as ſoon as they ſprout up, were eaten by the cattle conſtantly kept upon theſe lands by thoſe who farmed them of the public; that formerly the inhabitants did not ſuffer cattle to come where it grew. He ſays, that it only grew wild, and did not bear with culture; that it had a large thick root, a ferulaceous ſtalk, leaves very like thoſe of parſley; that the ſeed of it, from its flatneſs, (*planitie*) was called its leaf; that the leaves of it were of a golden colour, and were inſtead of its ſeed; and that they fell at the riſing of the dog-ſtar, and from theſe the *laſerpitium* ſprung; that both the root and the ſtalk were perfected in one year; that they took the juice of it two ways, *viz.* from its ſtalk, and from its root; that the firſt was far inferior to the ſecond, and ſoon ſpoiled. *Pliny* gives a large account of this herb, *nat. hiſt. lib.* xix. *c.* 3. of its ſeveral ſorts, and the uſes to which it was applied, and of the ways of adulterating it; that the genuine ſort is of a moderately red colour, and, when broken, white on the inſide, and preſently afterwards becomes tranſparent; that a drop or bit of it preſently diſſolves in water or ſpittle; that it is ſomewhat like myrrh (σμυρνίζων); that the true *ſilphium* was become ſo rare, that, in his memory, only one ſtalk of it had been found, which had been ſent to *Nero*, which he valued ſo much, that he kept it, with his gold and ſilver, in his treaſure, and produced it as a great curioſity (the words are, *he brought it out of his treaſure with his gold and ſilver*); that it was ſo kept by the *Cyrenians*, that it could not be exported, but by ſtealth. The curious may compare the deſcription that *Pliny*, *Theophraſtus*, and *Galen*, give of the *ſilphium* or *laſerpitium* of their days, and ſee if it agrees with what they call now by that name. It is ſtrange, that our author ſhould recommend the uſe of the root of this herb for preſerving lentils, ſeeing it was ſo rare to be found; but probably the herb, which they commonly called *laſerpitium*, was not the genuine *ſilphium*.

(9) *Linum*, flax. This is ſo uſeful a vegetable to mankind, that, next to corn that ſuſtains them, there is not any thing in nature of greater benefit to them. *Pliny*, in his *natural hiſtory*, ſays, it is ſown in gravelly places, in land once plowed; that nothing makes greater haſte; for it is ſown in the ſpring, and pulled in ſummer. He mentions many nations, who, in his time, made a traffick of flax, and manufactured it: *Egypt* particularly was famous for it, and carried it into *Arabia* and *India*; and, even in his time, this manufacture was common throughout all *Gaul*; and he ſays, that the enemies of the *Roman* empire, who lived beyond the *Rhine*, were very dextrous at it; and that their women's moſt beautiful garments were made of flax: ſo that, in his days, this uſeful manufacture

for, above all other ſeeds, it is hurtful to lands: therefore it requires the fatteſt place, and moderately moiſt. It is ſown from the firſt of *October* till the riſing of *aquila* (10) (the eagle), which is on the 7th of *December*. A *jugerum* of land is ſown with eight *modii* of it. Some think it proper, that the ſeed be committed exceeding thick to lean ground, that the flax may come up ſmall and fine; and they ſay, that, if it be ſown in rich ſtrong land, in the month of *February*, ten *modii* of it muſt be thrown upon one *jugerum*.

Seſamum (11), which is well watered, muſt be ſown earlier; but ſuch as is ſown in land which wants moiſture, muſt be ſown from the autumnal equinox to the 15th of *October*. For the moſt part, it requires that crumbling, looſe, rotten ground, which the *Campanians* call *black mould*. Nevertheleſs it does not thrive worſe in fat ſands alſo, and in ground gathered together from different places. And the ſame quantity of this ſeed is ſown upon a *jugerum* of ground, as of millet and panic, and ſometimes alſo two *ſextarii* more. But I myſelf indeed have ſeen this ſeed ſown in the months of *June* and *July* in the countries of *Syria* and *Cilicia*, and reaped in autumn, after it was fully ripe.

Chichlings, which are like to peaſe, ought to be ſown in the month of *January* or *February*, in rich fertile ground, and in moiſt weather. Nevertheleſs, in ſome parts of *Italy*, they ſow them before the firſt of *November*. Three *modii* of them fill a *jugerum* of ground. Nor is there any ſort of pulſe which does leſs hurt to land; but it very ſeldom anſwers, becauſe, in the bloſſom, it can neither bear droughts, nor ſouth winds; both which inconveniencies happen commonly at that time of the year, when it begins to caſt its bloſſoms.

What they call the *ram-chich-pea* (12), and that other ſort, which they

facture ſeems to have extended over all the *Roman* empire, and much farther. The uſe, both of the huſk, and of its ſeed, ſeems to have been known many ages before in the eaſtern parts of the world, eſpecially in *Egypt*, where the fineſt linen in the whole world was made long before the *Roman* empire made any figure in the world. The ſeed of it affords an oil of very great uſe, not only in phyſic, and many different trades, but for burning alſo, being more durable in lamps than oil-olive.

(10) *Aquila*, the eagle, a conſtellation of the northern hemiſphere, commonly joined with *Antinous*.

(11) *Seſamum*. *Pliny* ſays, that it came firſt from *India*, where they make great quantities of oil of it, not only for lamps, but alſo for eating. *Theophraſtus* ſays, that it has a ſtalk like millet, but thicker and higher, with red leaves, and graſs-coloured flowers; and that its ſeed is ſhut up in ſeed-veſſels, like poppy-ſeed. And *Pliny* ſays, that it has a ferulaceous ſtalk, a leaf of the colour of blood; and that the colour of the ſeed is white. *Theophraſt. lib.* viii. ſays, that, of all ſeeds, it is the moſt troubleſome to the ground, and emaciates it moſt.

(12) *Cicer*, a chich-pea. The *Greeks* call it ἐρέβινθος. *Pliny* ſays, that it has a certain faltiſh juice or liquor peculiar to itſelf; which, *Theophraſtus* ſays, if too much rain waſh

they call the *Punic* or *red chich-pea*, can be ſown all the month of *March* in a moiſt climate, and in the fertileſt ground; for it alſo hurts the earth: and therefore the wiſeſt Huſbandmen diſapprove of it. Nevertheleſs, if it is to be ſown, it muſt be ſteeped the day before, that it may ſpring out the ſooner. Three *modii* are ſufficient for one *jugerum*.

Hemp (13) requires fat, well-dunged, and well-watered ground, or that which is flat, moiſt, and manured very deep. They ſow ſix grains of this ſeed upon a foot ſquare, about the time that *Arcturus* (14) riſes, which is toward the latter end of *February*, about the 24th or 25th day. Nor will it be amiſs to ſow it at any time till the vernal Equinox, if the conſtitution of the climate, or the weather, be rainy.

After theſe ſorts of pulſe, we muſt take navews and turneps into conſideration; for both of them fill the bellies of ruſtics. Nevertheleſs turneps (15) are more uſeful, becauſe they both yield a greater increaſe, and

away, it rots, and is deſtroyed by the worms. There are ſeveral ſorts of it, as *Pliny* ſays, which differ in bulk, figure, colour, and taſte. There is one ſort of it *arietino capiti ſimile*, like a ram's head, which *Columella* calls *cicer arietinum*, and *Theophraſtus* κριὸς ἐρίφιος· and of this *Pliny* ſays there is both a black and a white ſort. There is another ſort, which they called *cicer columbinum*, becauſe perhaps they fed doves with it. This they called alſo *cicer Venereum*, becauſe they uſed it in *Venus's* vigils. It was white, round, ſmooth, and ſmaller than the ram-chich-pea, as *Pliny* ſays.

Cicercula, a chichling. It is a diminutive of *cicer*, a ſmaller ſort of chich-pea, ſhaped like a pea. *Pliny* ſays, that that is the ſweeteſt which is the likeſt the bitter vetch; and that the black and red is firmer than the white.

(13) *Cannabis*, hemp. *Pliny* ſays, the thicker it is ſown, the ſmaller it is; therefore our author adviſes to ſet ſix grains upon a foot ſquare of ground. When its ſeed is ripe, they ſtrip it off its ſtalk about the autumnal equinox, and dry it in the ſun, or wind, or in the ſmoke. The hemp itſelf is gathered after the vintage; ſo that, it ſeems, they gathered the ſeed before they pulled the ſtalks. There are two ſorts of it, the male and the female. The male pours forth more branches from its ſtalk, making the appearance of a little tree. The female has much ſmaller ſtalks, and not branched as the other. Both male and female have leaves like the aſh-tree, but ſmaller, and gradually ſerrated. They are larger and blacker in the male; and five or ſix of them come forth of one pedicle. The ſeed grows only upon the male, of an aſh-colour, the marrow of which is ſweet and white. The hemp that grows in *Italy* is reckoned very good, eſpecially that of the territory of *Bologna*.

(14) *Arcturus*, a fixed ſtar of the firſt magnitude, ſo called ἀπὸ τῆς οὐρᾶς τῆς ἄρκτου, becauſe, *Servius* ſays, it is placed after the tail of the Greater Bear. It is in the conſtellation *Arctophylax* or *Bootes*.

(15) *Rapum*, a turnep. *Pliny* ſays, that, if due order were to be obſerved, turneps ought to be conſidered next to corn, or at leaſt beans, ſince nothing is of more uſe; for they grow for all animals: four-footed beaſts delight in their leaves; and men are as well pleaſed with their tender leaves in their ſeaſon, as with ſprouts; and they are a great relief when there is a ſcarcity of corn, and often prevent a famine. He ſays, that, after corn and wine, they are the fruit, which the people, that live beyond the *Po*, have moſt in requeſt. They may be ſown where almoſt nothing elſe can be ſown. They are nouriſhed by the froſts, and fogs, and colds; and there are ſome of them of a wonderful bigneſs. *Pliny* ſays, he had ſeen ſome that weighed 40 pounds; and ſome authors affirm they have

and they are food not only for man, but for oxen alſo, eſpecially in *Gaul*, where this kind of root affords nouriſhment for the foreſaid cattle during the winter. Both of them require a rotten, crumbling, looſe ſoil, and don't grow in thick cloſe ground; but turneps thrive beſt in open plains, and moiſt lands. The navew (16) loves land that is ſhelving and dry, and which comes nearer to that which is lean and poor, therefore grows better in gravelly and ſandy lands; and the quality of the place changes the ſeeds of both the one and the other: for, in a different ſoil, in two years time, turneps are changed into navews, and navews aſſume the likeneſs of turneps. In grounds that are well watered, it is right to ſow them both after the ſummer ſolſtice; but in dry, in the latter end of the month of *Auguſt*, or in the beginning of *September*. They require ground that is well manured over and over again, either with the plough or the ſpade, and ſatiated with plenty of dung; for this is of great importance, not only becauſe they come forth better, and bring a greater increaſe, but becauſe, after a plentiful crop of them, ground, thus managed, bears excellent corn. There muſt not be more than four *ſextarii* of turnep-ſeed ſown upon one *jugerum* of land; and a fourth part more of navew-ſeed muſt be ſcattered upon a *jugerum* of land, becauſe it does not ſpread and inlarge itſelf into a broad belly, but ſtrikes its ſlender root downward. And theſe things, we are of opinion, ought to be ſown for the uſe of men, and thoſe that follow next for the uſe of cattle.

have ſeen ſome of a much greater bulk: ſo that it is not a little wonderful, that, of ſo ſmall a ſeed, there ſhould grow, in three months time, ſo great a root. It is common to ſee, among the *Alps*, ſome of them weigh 30 pounds. The turneps about *Nurſia*, a town of the *Sabines*, were in greateſt eſteem in our author's days. The next are thoſe of mount *Algido* in the *Tuſculan* land, next to mount *Albano*, about 15 miles from *Rome*. The *Amiternian* navews, which are of the ſame nature with turneps, rejoice equally in cold weather. *Matthiolus* ſays, that in *Inſubria* (*viz.* the ſtate of *Milan*, and ſome adjacent countries) they ſow their turneps and navews as ſoon as the corns are taken off their lands in *June* and *July*; and, in the month of *October*, when the root is grown to its utmoſt ſize, they pull it up. In *Greek* the turnep is called γογγύλη, from the round form of its root.

(16) The *napus*, navew, is by ſome thought to be what the *Greeks* called βύνιον but authors differ about it. And indeed if the *Greeks* called this root by this name from βῦνος, which ſignifies a little hill, or round riſing ground, it muſt be different from the *napus*, which, our author ſays, was not round.

CHAP.

CHAP. XI.

Of the ſeveral Sorts of Fodder, of Medic, Vetches, or Tares, Miſcelline, Oats, Fenugreek, the bitter Vetch, and the Chich-peaſe (1).

THERE are many ſorts of fodder, as medic, vetches, miſcelline or barley-fodder, alſo fenugreek (2) and oats, as alſo the bitter vetch, and the chich-pea. As for the reſt, we don't think it worth our while to enumerate them, and much leſs to ſow them. Nevertheleſs we except the *cythiſus* (ſhrub-clover) of which we ſhall ſpeak in thoſe books we have written of the ſeveral kinds of ſprigs or plants of trees. But, of all thoſe that pleaſe us, the herb medic (3) is the choiceſt,

(1) *Geſnerus*, in his notes upon our author, thinks, that the conſtruction in the beginning of this chapter confirms his opinion, that the preſent diviſion we have of this author into chapters was not made by *Columella* himſelf; otherwiſe he would have begun this chapter in a different manner: and his opinion ſeems very well founded; for there are about ten accuſatives without any verb to govern them, except you bring it from the laſt ſentence of the foregoing chapter, which is not very common; whereas, if there were no new chapter, the conſtruction would be natural enough; and either ſome word is wanting, or the author intended it as the continuation of the ſame ſentence: ſo that I have tranſlated them as if they were all nominatives, and added the ſubſtantive verb.

(2) *Farrago* has been before explained. *Pliny* ſays, that it was alſo made of the cleanſings or refuſe of the huſked bearded wheat, and ſometimes it had fitches mixed with it.

(3) *Medica*, medic. Father *Hardouin* ſays, it is now called *great trefoil*, or *Burgundy hay*, or *luzern*, more commonly *ſaintfoin*. *Pliny* calls it a foreign herb from *Greece*, and ſays, that it was brought thither by the *Medes*, during the *Perſian* war, in the time of *Darius*; and that it is of ſo great value, that it deſerves to be deſcribed amongſt the firſt; for, from once ſowing, it will laſt thirty years. Our author ſays, only ten, and from him *Palladius*. It has a jointed ſtalk and leaves, like trefoil; the higher it grows, the narrower are the leaves: that the ground where it is ſown muſt be freed from ſtones, and well manured in autumn, then afterwards plowed, then harrowed twice or thrice, five days intervening, and then dunged. It requires juicy land, or muſt be well watered. It muſt be ſown in *May*. All the ground muſt be covered thick with ſeed; and all the weeds, that grow amongſt it, muſt be plucked up. There muſt be twenty *modii* of ſeed to a *jugerum* of land. If the ground be moiſt or weedy, it ſoon degenerates into meadow ground: ſo, when it is an inch high, it ought to be cleared of herbs, rather by hand than with a ſarcle. They cut it when it begins to bloſſom, and as often as it bloſſoms anew, which it does ſix times a year, at leaſt four. It ought not to be ſuffered to ripen into ſeed, becauſe the fodder of it is more uſeful, till it be three years old, and then it ought to be cut cloſe to the ground. Thus the other herbs periſh, while it ſuffers nothing, becauſe of the deepneſs of its roots. *Matthiolus* ſays, that tho' this medic was formerly ſown for fodder in all parts of *Italy*, and was known to every body, yet, in his time, he ſcarcely found any who ever had ſeen it, ſo far were they from ſowing it. They ſay, that it abounds in *Spain*; and *Ruellius* ſays, it grows in *France*, and is there called the *greater trefoil* or *ſaintfoin*. From a long, ſmall, woody root come forth ſeveral little ſtalks, a cubit

ceſt, becauſe, when it is once ſown, it laſts ten years; and it can bear to be cut down four times, and ſometimes alſo ſix times, in a year, becauſe it dungs the land; and all emaciated cattle whatſoever grow fat with it, becauſe it is a remedy for ſick cattle; and a *jugerum* of it is abundantly ſufficient for three horſes the whole year. It is ſown as we ſhall hereafter direct.

About the beginning of *October*, cut up the place wherein you deſign to ſow medic the next ſpring; and let it lie all winter to rot and grow crumbly. Then, about the firſt of *February*, plow it carefully a ſecond time, and carry all the ſtones out of it, and break all the clods. Afterwards, about the month of *March*, plow it a third time, and harrow it. When you have thus manured the ground, make it, in the manner of a garden, into beds or diviſions ten feet broad, and fifty feet long, that ſo it may be ſupplied with water by foot-paths, and that there may be an open acceſs for the weeders on both ſides. Then throw old dung upon it; and ſo, in the latter end of *April*, ſow it in ſuch a proportion, that each *cyathus* of ſeed may take up a place ten feet long, and five broad. After you have done this, let the ſeeds, that are thrown into the ground, be preſently covered with earth with wooden rakes; for this is a great advantage to them, becauſe they are very quickly burnt up with the ſun. After the ſowing, the place ought not to be touched with an iron tool, and, as I ſaid, it muſt be raked with wooden rakes, and weeded from time to time, leſt any other kind of herb deſtroy the feeble medic. You muſt cut the firſt crop of it ſomewhat later, after it has put forth ſome part of its ſeeds. Afterwards, you are at liberty to cut it down as tender and young as you pleaſe, after it is ſprung up, and to give it to horſes; but, at firſt, you muſt give it them more ſparingly, till they be accuſtomed to it, leſt the novelty of the fodder be hurtful to them; for it blows them up, and creates much blood: but water it very often after you have cut it. Then, after a few days, when it ſhall begin to ſprout, weed out of it all herbs of a different kind. When cultivated in this manner, it may be cut down ſix times in a year; and it will laſt ten years.

cubit long, round, green, weak, and, for the moſt part, lying on the ground, about which grow leaves in the form of trefoil, firſt broader, then leſſer, oblong, and ſerrated all round. The flowers or bloſſoms come forth in the form of *trefoils*, in the wings of the leaves, and form, as it were, a ſpike, of a blue colour, to which ſucceed pods reſembling the ſhell of a ſnail, but narrower, and twiſted like a ram's horn, contracted into two or three windings, which contain a minute, oblong, and yellowiſh ſeed. It varies in its flowers, which are blue, violet, purple-blue, and blackiſh, *&c.* They ſow it in *Spain* for hay, and cut it down every month in ſummer. Thus far *Pliny*, and *Matthiolus* on *Dioſcorides*.

But there are two times for ſowing vetches (4); the firſt ſowing is for fodder, when, about the time of the autumnal Equinox, we ſow ſeven *modii* of it upon one *jugerum*. The ſecond ſowing is in the month of *January*, or even later, when we throw ſix *modii* of it upon a *jugerum*, for producing of ſeed. Both theſe ſowings may be made in unplowed land, but better in that which is tilled. And this kind of ſeed eſpecially does not love dews when it is ſown; therefore it muſt be ſcattered after the ſecond or third hour of the day, when all the moiſture is dried up by the ſun, or the wind: and no more of it ought to be thrown into the ground, than can be covered the ſame day; for, if the night come upon us before it be put under-ground, the leaſt moiſture ſpoils it. We muſt obſerve not to commit it to the earth before the twenty-fifth day of the moon; otherwiſe we commonly find, that the ſnail hurts it after it is ſown.

It is proper to ſow miſcelleny, or barley-fodder, in a place that is plowed and ſown every year, and exceedingly well dunged, and which has had a ſecond furrow. It turns out beſt, when ten *modii* of horſe-barley are ſown upon one *jugerum* of land about the time of the autumnal Equinox, but when the rains are impendent, that ſo, being ſown, and watered with ſhowers, it may come forth quickly, and take root, and become ſtrong, before the violence of the winter; for, in cold weather, when other ſorts of fodder fail us, this, when it is cut, is the beſt fodder we can give to oxen and other cattle; and, if you ſhall think fit to let them feed upon it, and eat it down frequently, while it is growing, it ſufficeth till the month of *May*. But, if you have a mind to reap ſome ſeed of it alſo, the cattle muſt be driven away, and kept from it, after the firſt of *March*; and it muſt be defended from all harm, that it may be fit for producing a good crop of grain.

The ſame method is to be obſerved with reſpect to ſowing of oats, which, being ſown in autumn, are partly cut for hay or fodder, while they are yet green, and partly kept for ſeed. *Fenugreek* (5), which Peaſants

(4) *Ervum*, ὄροβος, bitter vetch. It is a plant with many ſprays, full of leaves, lying upon the ground, its ſtalks and branches twiſting and folding themſelves with one another. Its leaves are ſmall, ſomewhat longiſh, leſs than thoſe of the lentil, many of them coming forth of one pedicle, riſing out of it on each ſide at ſmall diſtances, and one leaf by itſelf on the top. It has ſmall flowers, inclining ſomewhat to purple, and ſometimes to white. It bears a huſk almoſt like the pea, but ſhorter and ſlenderer, in which is incloſed a round ſeed, the huſk preſſed in cloſe betwixt each grain. It is of two ſorts, white and red. Some ſay it is called ὄροβος ἀπὸ τῦ ἐρέπεσθαι ὑπὸ τῶν βοῶν, becauſe oxen feed on it, and are fattened thereby.

(5) *Fenum Græcum*, fenugreek. This ſeed produces a plant like trefoil. It has its leaves all ſerrated, or jagged round, ſmall ſtalks, ſeveral of them coming forth from one root, with ſmall white flowers, from which come forth ſmall crooked pods, like horns, in

Peaſants call *ſiliqua* (the huſk), has two ſeaſons for ſowing, of which the firſt is in the month of *September* (when it is ſown for fodder) about the time of the Equinox, the ſame days on which they ſow vetches. The ſecond is on the laſt day of *January*, or on the firſt of *February*, when it is ſown for a crop of ſeed. But, in order to the firſt, we ſow ſeven *modii*, and to the laſt ſix, upon one *jugerum* of ground. Both theſe ſowings are made not incommodiouſly on land before it is plowed; and care muſt be taken to plow it very cloſe, but not deep; for, if its ſeed is buried deeper than four fingers, it does not come forth eaſily: for which reaſon ſome people, before they ſow it, till the ground with the ſmalleſt ploughs, and ſo throw the ſeeds upon it, and with rakes, cover them over with earth.

But the bitter vetch rejoices and thrives mightily in a lean, but not in a moiſt place, becauſe, for the moſt part, it rotteth, and is ſpoiled with luxuriancy. It may alſo be ſown in autumn, and equally well after the middle of winter, in the latter end of *January*, or during the whole month of *February*, provided it be before the firſt of *March*; which whole month Huſbandmen deny to be ſuitable and agreeable to this ſort of pulſe, becauſe, when it is ſown at this time, it is hurtful to cattle, and eſpecially to oxen, which it makes reſtive and headſtrong, when they feed upon it, and eat it as fodder. They ſow five *modii* of it upon a *jugerum*.

In that part of *Spain* they call *Bætica*, they give bruiſed chich-peaſe to oxen, inſtead of bitter vetches; which, after they have ſplit and broken them ſlightly with the ſuſpended milſtone, they ſteep a little in water, till they grow clammy, and ſo mix them with chaff and bruiſed ſtraw, and give them to the cattle. But twelve pounds of bitter vetches, and ſixteen pounds of chich-peaſe, ſatisfy one yoke of oxen. This ſame is neither unſerviceable nor unpleaſant to men. In taſte the chich-pea differs nothing from the chichling. It is only known and diſtinguiſhed by the colour; for the colour is more obſolete or faded, and nearer to black. They ſow them either after a firſt or ſecond plowing, in the month of *March*, according as the richneſs of the ſoil requires, becauſe four *modii* of the ſame, and ſometimes three, and ſometimes alſo two and a half, take up a *jugerum* of land.

in which is incloſed a yellowiſh fat ſeed, of a diſagreeable ſmell. It is ſown in fat ground in *February* and *March* in warm tracts of ground. From the form of its pod, it is called by the *Greeks* βυκίρας and αἰγικέρας. *Pliny* calls it *ſilica* and *ſilicia*; and ſays, that the earth muſt only be ſcarified when it is ſown, the furrow not deeper than four inches; and the worſe it is handled, ſo much the better does it thrive: a very rare thing, that negligence ſhould be profitable to any thing whatſoever!

CHAP. XII.

After what Manner, and with what Number of Labourers, each Sort of Corn and Pulſe may be cultivated.

FORASMUCH as we have fully treated of the time when every thing muſt be ſown, now we ſhall ſhew after what manner, and with what number of labourers, each of the things we have mentioned, muſt be cultivated. After we have finiſhed our ſowing, our next care is of ſarcling (1), concerning which authors are not agreed. Some deny that it is of any ſervice, becauſe the roots of the corn are laid open and uncovered with the ſarcle, ſome of them alſo are cut, and, if the colds come upon them, and ſurpriſe them, after ſarcling, the corns are killed by the froſt; but that it is better to cleanſe and weed them in due time. Nevertheleſs there are many who are of opinion, that they ſhould be ſarcled; but that it ought not to be done at random, either after the ſame manner, or at the ſame time every-where; for, in lands that are dry, and expoſed to the ſun, as ſoon as the corns can bear ſarcling, they ought to be covered with the earth, after it has been thoroughly ſtirred, that ſo they may be able to ſprout, and put forth their ſtem; which very thing muſt be done before winter, and then it muſt be done a ſecond time after the winter is paſt; but that, in cold and marſhy places, the corns ought to be ſarcled, for the moſt part, after the winter is over, but not covered with earth, but the earth throughly ſtirred with even, plain, ſmooth ſarcling. Nevertheleſs we find, that, in many countries, winter ſarcling is very proper, only indeed where the drineſs of the climate, and the gentle warmth of the weather, allow it. But neither are we of opinion, that that ought to be done everywhere, but that we muſt conform to the cuſtom of the inhabitants;

(1) *Sarculatio ſive ſarritio.* I have ſeen theſe two words ſometimes tranſlated *weeding* or *raking*; but it is a very different work, and may be performed where there are no weeds. *Sarculare* is to open the ſurface of the earth, hardened by the ſeverity of the winter, that ſo it may admit the freſh heat of the ſun. *Pliny* gives this explication of the word; and this hardened ſtate of the ſurface of the ground he calls *ſoli triſtitiam*, as if, by the colds, the earth was made ſad and depreſſed, from which it is relieved and made glad, as it were, by the admiſſion of the warmth of the ſun. I tranſlate it moſtly by a word which is not ſo common (*viz.* to ſarcle); but which, if commonly uſed, would better expreſs this action, than to *hoe*, which is more than moving the ſurface only, if I miſtake not; for thereby the earth is gathered and heaped up about the plant, which is not the meaning of the word *ſarculare*; for our author, when he orders this to be done, always adds to the plain ſarcling *aggerare terram*, or *terra obruere*, &c. which ſhews, that *ſarculare* does not expreſs ſo much.

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for countries have their own peculiar gifts and advantages beſtowed by nature, as *Egypt* and *Africa*, where the Huſbandman does not touch the corns, after he has ſown them, till the harveſt; becauſe the conſtitution of the climate, and the goodneſs of the earth, are ſuch, that ſcarcely any herb comes up but from ſeed ſown, either becauſe ſhowers are rare, or becauſe the quality of the ground does thus yield itſelf to them who cultivate it.

But, in thoſe places where ſarcling is requiſite, the corns that grow upon the ground muſt not be touched before they have intirely covered the furrows, even tho' the ſtate of the weather allows it. It will be right to ſarcle common wheat, and huſked bearded wheat, when they have begun to have four fibres or leaves (2); and barley, when it has five; beans, and other ſorts of pulſe, when they appear four inches above ground. Nevertheleſs lupins are excepted, ſarcling being hurtful to this ſeed, becauſe it has but one root, which if it be either cut with the iron tool, or wounded, the whole ſtalk dies: and, tho' this were not the caſe, yet this culture would be ſuperfluous, ſeeing this thing alone is ſo far from being annoyed with weeds, that itſelf deſtroys weeds. But other growing corns, which may be ſtirred even when they are wet, yet it is better to ſarcle them when they are dry; for, when they are managed after this manner, they are not annoyed with blaſting and mildew. But barley, unleſs it be exceeding dry, ought not to be touched.

Many indeed think, that beans ought not to be hoed, becauſe, being pulled up, and gathered by hand, they may both be ſeparated from ſuch other things as ought to be rooted up by the weeder, and alſo the graſs and herbs, which are grown up among them, may be reſerved for hay. *Cornelius Celſus* alſo is of this opinion, who, among the other advantages and good qualities of pulſe, reckons this alſo; *viz.* that, after you have gathered the beans, you may, from the ſame place, cut a crop of hay. But it ſeems to me a ſign of a very bad Huſbandman to allow weeds to come up with any thing whatſoever that he has ſown; for, if weeding be given over and neglected, it will diminiſh very much the increaſe of all ſorts of corn and grain whatſoever: for it is not at all the part of a prudent Huſbandman to apply himſelf more to procure fodder for cattle, than food for men, eſpecially conſidering, that that may be obtained by the culture of meadows. And I am ſo much of

(2) *Poſtquam cæperit eſſe quatuor fibrarum.* Father *Hardouin*, in his notes on *Pliny's nat. hiſt.* takes theſe words to ſignify *after the roots begin to have four fibres*; but *Palladius*, who, in moſt places, follows this author, underſtands them of the leaves or blades which the ſtem putteth forth, *triticum & far ſarritur quatuor foliorum*, *lib.* ii. *tit.* 9.

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the opinion; that beans are to be ſarcled, that, I think, they ought to be thrice ſarcled; for, when they are thus cultivated, we find, that they not only multiply their fruit, but that a very ſmall portion of their ſubſtance runs into the huſks; and that a *modius* of them, when ſhaled and cleanſed, will fill the *modius* almoſt as full as when they were intire; and that the meaſure is ſcarcely diminiſhed by ſtripping them of their pods: and, in general, as we have already ſaid, winter ſarcling is a very great help, and a vaſt advantage, when the weather is fair and dry, after the middle of winter is paſt, in the month of *January*, if there be no froſts. Moreover, it ought to be ſo done, that the roots of the corns may not be hurt, but rather that they be intirely covered, and the earth raiſed and heaped upon them, that the ſtalk may ſpread itſelf farther upon the ground (3). It will be of great uſe and advantage to have done this at the firſt ſarcling, but, at the ſecond, it will be hurtful; for, when the corn has given over pullulating, if you cover it with earth, it will rot: therefore nothing more ought to be done in ſarcling it a ſecond time, but to ſtir and move the ground equally. And this muſt be done immediately after the vernal Equinox is paſt, within twenty days, before the corn begins to knot; for, when it is ſarcled later, it is ſpoiled by the enſuing ſummer droughts and heats.

To ſarcling we muſt ſubjoin weeding (4); and we muſt take care not to touch the corn when it is in the bloſſom, but either before, or preſently after it has caſt its flower: for all kinds of corn and barley, and, in a word, whatever does not ſpring of a double ſeed (5), ſends forth the ear from the third to the fourth knot; and, after it has put it all forth, in eight days it caſts its bloſſom, and then continues to grow larger for forty days, in which, after the flower, it comes to maturity. Again, ſuch as ſpring of a double ſeed, as the bean, the pea, the lentil, bloſſom forty days, and, at the ſame time, continue to grow larger.

(3) *Ut latius ſe humi frutex diffundat*, that the ſtalk may diffuſe or ſpread itſelf the wider upon the ground. Perhaps the author alſo means, that, the earth being gathered together, and heaped upon the corns, not only its ſtalk may ſpread its blade, but that its root alſo may diffuſe itſelf the wider.

(4) *Runcatio*, weeding, ſets the roots of the corn at liberty, when it is jointed, by plucking up the uſeleſs weeds, and ſeparates and ſevereth it from the green turf, and common graſs, and other weeds, that choak it.

(5) *Duplicis ſeminis*. By double ſeed here ſome underſtand, that, when the ſeed of the bean, peaſe, *&c.* has been, for ſome time, committed to the ground, it divides itſelf into two diſtinct lobes, between which the germ or bud, which hitherto had lurked therein, unfolds itſelf, and comes forth; ſo that, afterwards, the lobes on each ſide ſtick to the plant like two leaves. It is certain, that wheat and barley, *&c.* when their ſeeds begin to bud in the earth, have a different appearance from beans, peaſe, *&c.* and do not ſeparate and divide themſelves after the ſame manner.

CHAP.

CHAP. XIII.

How many Day-labourers may be aſſigned to every Sort of Land, in Proportion to the Extent of it, and to the Manner of cultivating it.

AND that we may now reckon up with how many days labour the ſeeds we have committed to the earth may be brought to the threſhing-floor; four or five *modii* of common wheat take up four days labour of the Ploughman, one of the Harrower, two of the Hoer or Sarcler, for the firſt time, and one when they are ſarcled a ſecond time, one of the Weeder, and of the Reaper one and an half; the ſum of the whole, ten days labour and one half: five *modii* of white winter wheat require as many. Nine or ten *modii* of *ſeſamum* require the ſame number of days labour as five *modii* of common wheat.

Five *modii* of barley require three days labour of the Ploughman, one day's labour to harrow it, one and a half to ſarcle it, and one to reap it; in all ſix days labour and one half. Four or ſix *modii* of beans, in old fallow-ground, take up two days labour of the Ploughman, and, in land that has been plowed and ſown the ſame year, one day's labour. They are harrowed with one day's labour and an half; hoed with one day's labour and an half; hoed a ſecond time with one, and a third time with one; and they are reaped with one day's labour. The ſum of all the days labour is ſeven or eight.

Six or ſeven *modii* of tares, in old fallow-ground, require two days labour of Ploughmen, and, in that which bears a crop every year, one day's labour. Alſo they are harrowed with one day's labour, and cut down with one; in the whole, three or four days labour. Five *modii* of bitter vetches are ſown with the ſame number of days labour, and harrowed with one; alſo they are ſarcled, weeded, and cut down, with one day's labour each. They all together take up ſix days labour. Six or ſeven *modii* of *fenugreek* are put under-ground with the ſame number of days labour, and are reaped with one. Four *modii* of *kidney-beans* are put under-ground with the like number of days labour, are harrowed with one, and cut down with one. Four *modii* of *chichlings* require three days labour of the Ploughmen; they are harrowed with one day's labour, weeded with one, and pulled up with one. The whole amounts to ſix days labour. A *modius* and an half of *lentils* require the ſame number of days labour; they are harrowed with one, ſarcled with two,

two, weeded with one, and pulled up with one day's labour; eight days labour in the whole.

Ten *modii* of *lupins* are put under-ground with one day's labour, harrowed with one, and reaped with one. Four *ſextarii* of *millet*, and as many of *panic*, take up four days labour of the Ploughmen; they are harrowed with three, and ſarcled with three days labour. It is uncertain with how many days labour they are pulled. Three *modii* of chich-peaſe are ſown with the ſame number of days labour; they are harrowed with two, ſarcled with one, weeded with one, and pulled with three days labour; in the whole, ten days labour. Eight or ten *modii* of linſeed are ſown with four yoke of oxen; they are harrowed with three days labour, weeded with one, and pulled with three days labour. The whole amounts to eleven days labour.

Six *ſextarii* of *ſeſamum* are cultivated with three yoke of oxen, ſo far as tilling the ground for them; they are harrowed with four days labour, ſarcled with four, and ſarcled a ſecond time with two, and reaped with two; in the whole, fifteen days labour. Hemp is ſown as we have already taught; but it is uncertain how great expence and care it requires. But medic is put under-ground, not with the plough, but, as I ſaid, with ſmall wooden rakes. A *jugerum* of its land is harrowed with two days labour, ſarcled with one, and reaped with one.

By this ſum total of days labour we collect, that two hundred *jugera* of land may be manured with two yoke of oxen, as many Ploughmen, and ſix common labourers, provided it be free from trees; but, if it be planted with trees for ſupporting vines, *Saſerna* affirms, that the ſame quantity may be well enough cultivated with the addition of three men more: which computation teaches us, that one yoke of oxen may ſuffice for one hundred and twenty-five *modii* of wheat, and as many of pulſe; ſo that the whole autumnal ſowing may amount to two hundred and fifty *modii*; and, after this, nevertheleſs, there may be ſeventy-five *modii* of trimeſtrian ſeed ſown. And this is made out thus: The ſeeds, which are ſown in twenty-five *jugera* of land, after four times plowing (1), require one hundred and fifteen days labour of Ploughmen; for this quantity of land, tho' exceeding hard, is tilled with fifty days labour, it is plowed a ſecond time with twenty-five, and plowed a third time, and ſown, with forty days labour. The ſeveral ſorts of pulſe employ and take up ſixty days labour, that is, two months. Forty-five days alſo are computed for rainy weather and

(1) *Semina quæ quarto ſulco ſeruntur.* By ſeeds ſown in the fourth furrow is meant ſown upon land plowed four times over; ſo likewiſe ſown in one, ſecond or third furrow, ſignifies once, twice, or thrice plowing.

holidays, in which they don't plow. Alſo, when the ſeed-time is over, we reckon thirty days, in which they reſt from their labour: ſo they amount in the whole to eight months and ten days. Nevertheleſs, over and above, there are three months and twenty-five days of the year remaining, which we may ſpend either in ſowing *trimeſtrian ſeed*, or in carrying of hay, and fodder, and all ſorts of dung, and other things neceſſary for our uſe.

CHAP. XIV.

What Sorts of Pulſe are hurtful to Lands, and what are of of Benefit to them.

BUT the ſame *Saſerna* thinks, that, by ſome of the ſeeds which I have mentioned, lands are dunged and helped; and that, on the contrary, by others they are burnt up and emaciated; and that they are dunged with lupins, beans, tares, bitter vetches, the lentil, chichling, and peaſe. As to lupins, I am in no doubt, nor yet as to the tare, when ſown for fodder, provided that the plough follow it immediately after it is cut down green, and that the Plough-ſhare tear up, and cover with earth, what the ſickle has left, before it withers; for this ſupplies the place of dung. But if, after the fodder is cut down, the roots of it, that are left, ſhall wither in the ground, they will take away all the juice of it, and conſume the ſtrength of the earth; and it is likely, that this is the caſe with beans alſo, and the other ſorts of pulſe, wherewith the earth ſeems to be fattened: ſo that, unleſs it be ripped up as ſoon as the crop you have of them is taken away, they will be of no benefit at all to corns that are ſown in that place afterwards. And *Tremellius* ſays alſo, that of all ſorts of pulſe that are pulled by hand, the poiſon of chich-peaſe and flax does moſt hurt to the ground; the one, becauſe it is of a ſaline, and the other, becauſe it is of an exceeding hot nature; which *Virgil* alſo intimates, by ſaying (1),

> 'A crop of *flax*, and *oats*, and *poppies* ſoak'd
> 'In *Lethe*'s drowſy ſtream, burns up the ground.'

Nor is there any doubt, but the land is annoyed and worſted, both by theſe ſeeds, as alſo by *millet* and *panic*; but there is one preſent

(1) *Virg. Georg. lib.* i. 77.

medicine and ſovereign cure for all ground that is worn out by crops of the foreſaid legumes, *viz.* that you help and relieve it with dung, and, by this ſort of nouriſhment, as it were, repair and reſtore its exhauſted ſtrength; and that not only for the advantage of ſeeds, which are committed to furrows made with the plough, but alſo for the benefit of trees and ſhrubs, which thrive much better with this ſort of nouriſhment. Wherefore, if it is, as it ſeems to me, exceeding profitable to Huſbandmen, I think it proper to diſcourſe of it more carefully, conſidering, that tho' this thing has not been intirely neglected by antient authors, yet they have treated of it but very ſuperficially.

CHAP. XV.

Of the ſeveral Kinds of Dung (1).

THERE are three principal ſorts of dung; *that* produced by fowls, *that* by men, and *that* by cattle. Of fowls that is reckoned the beſt, which is brought out of pigeon-houſes. Next to it is that which hens and other poultry breed, excepting nevertheleſs ſuch as live in fens and marſhes, and ſwimming fowls, as that of ducks and geeſe; for that is alſo hurtful. Nevertheleſs we approve moſt of pigeons dung, becauſe we find, that it ferments the earth, when it is moderately ſcattered upon it.

The *ſecond* is that which men make, if it be mixed with the other filth and ſweepings of the manor-houſe; for it is naturally very hot by itſelf, and therefore burns up the ground. Nevertheleſs human urine, which you have let grow old for ſix months, is fitter for ſhoots

(1) Moſt of the ruſtic writers, both *Greek* and *Latin*, agree in their notions about dung; and, if they ſeem to differ at any time, it is only when they ſpeak of the different application of it: ſo, when they ſeem to differ from our author, it is becauſe they ſpeak of applying it to trees, and he to corn-lands, *&c.*

Varro ſays, that pigeons dung is the beſt of any, becauſe it is exceeding hot, and ferments the earth; and he diſapproves of that of water-fowl, as geeſe, ducks, *&c.* as other antient authors alſo do, becauſe of its too great humidity. Pigeons dung is not to be ſpread upon land thick like other dung, but to be ſcattered very thin. Some mix it with the ſeed, and ſo ſow it. They who lett their aviaries, often reſerved the dung, and conſequently lett them much cheaper.

Varro places the dung of goats, ſheep, and aſſes, in the third rank; but *Columella* places that of aſſes before that of goats and ſheep, for a very good reaſon, becauſe theſe animals chew their food better. *Varro* ſeems not to approve of horſe-dung for corn-lands; but ſays, that all dung of horſes and other cattle is beſt for meadows, becauſe it breeds many herbs.

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and young trees. If you apply it to vines, or to apple-bearing trees, there is nothing that contributes more to make them bear abundance of fruit; nor does this thing only produce a greater increaſe, but it alſo improves both the taſte and the flavour of the wine, and of the apples.

Old lees of oil alſo, which have no ſalt in them, mixed with this, may very properly be made uſe of for watering fruit-bearing trees, and eſpecially olives; for lees alſo applied by themſelves are of great benefit to them; but both the one and the other is to be uſed chiefly during the winter, and even in the ſpring, before the ſummer heats, while the roots of the vines and the trees don't lie open and bare.

The dung of cattle obtains the third place, and in it alſo there is ſome difference; for that which the aſs makes is reckoned the beſt, becauſe that animal eats very ſlowly, and therefore digeſts more eaſily, and yields a dung that is well prepared, and fit for the land immediately. After theſe we have mentioned is ſheeps dung, and next to it that of goats, and then that of horſes, and other large cattle of all ſorts. Hogs dung is reckoned the worſt of all. Yea, aſhes alſo, and ſoot, have been of great benefit to things that are either planted or ſown; and the ſtalks of lupins, cut down, ſtrengthen as much as the beſt of dung.

Nor am I ignorant, that there is a certain kind of land, and ſome places in the country, wherein neither cattle nor fowls can be kept; yet it is a ſign of a ſlothful Huſbandman, even in ſuch a place as that, to be deſtitute of dung: for he may amaſs and put together any kind of leaves, and collections of any other things, out of thickets and highways; he may cut down ferns, without doing any injury to his neighbour; yea, he may even do him ſervice by it, and mix them throughly with the dirt and ſweepings of the court-yard; he may ſink a pit, ſuch as we directed to be made in our firſt book, for laying up dung in, and gather into it, in one heap, aſhes and dirt of the kennels, ſinks, and common ſewers, ſtraw, and ſtubble, and the other things that are ſwept out of the houſe.

But, in the middle of this ſame place, it is proper to faſten ſome oak-wood; for this will hinder miſchievous hurtful ſerpents to lurk in the dung. Theſe things muſt be done where the land is deſtitute of cattle; for where there are flocks and herds of four-footed beaſts abiding for ordinary, there are ſome things, which ought to be cleaned every day, as the kitchen and the dairy; and ſome things on rainy days, as the cow-houſes, the ox-ſtalls, and the ſheep-folds. But, if you have only corn-land, there is no occaſion to keep the ſeveral ſorts of dung ſeparate. But, if the ground is laid out and prepared for plantations of young trees, and for corns, and alſo for meadows, the dung muſt be laid up

ſeparately, according to its kind, as that of goats and of fowls. Then the other ſorts muſt be all gathered into the hollow place before-mentioned, and glutted with continual moiſture, that ſo the ſeeds of the herbs, that are mixed with the ſtalks, and the ſtraw and ſtubble, and other things, may rot. Then, in the ſummer-months, the whole dunghil muſt be throughly mixed and ſhuffled with ſpades, in the ſame manner as if you repaſtinated it, that it may rot the more eaſily, and be fit for corn-lands. And I think, that thoſe Huſbandmen are not very diligent, with whom each of the leſſer cattle, in thirty days, makes leſs than one load of dung (2), and their greater cattle alſo leſs than ten loads each, and each of the men as many, who may draw together and amaſs into one place, not only the filth which comes out of their own bodies, but all the dirt that the houſe and the court-yard daily produce.

I have this further precept alſo to add, that all kind of dung laid up in due time, which has reſted one whole year, is the moſt uſeful for corn; for it both has its ſtrength as yet intire, and does not breed weeds; but ſo much the older it is, the leſs good it does, becauſe it has leſs ſtrength: therefore the very freſheſt dung ought to be thrown upon meadows, becauſe it produces more herbs. And it is expedient, that this be done in the month of *February*, during the increaſe of the moon; for even this alſo contributes ſomewhat to a good crop of hay. What further uſe is to be made of dung, and after what manner it ought to be uſed with reſpect to every thing, we ſhall explain, when we come to treat of every particular thing by itſelf.

CHAP. XVI.

At what Times Lands muſt be dunged.

IN the mean time, whoever has a mind to prepare lands for corns, if he is reſolved to ſow his ſeed in autumn, let him lay ſmall heaps of dung in due order upon it, in the month of *September*; but, if he deſigns to ſow in the ſpring, let him lay his dung at any time in winter, while the moon is decreaſing, ſo that a *jugerum* of plain level land may hold twelve loads of dung, and a *jugerum* of that which is hilly and ſhelving twenty-four loads; and, as I ſaid a little before, let him not ſpread the heaps till he is going to ſow. Nevertheleſs, if any thing

(2) *Vehes ſtercoris.* Their load of dung contained 80 *modii, lib.* xi. 2. which amounts to about 20 buſhels and almoſt 2 pecks.

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has hindered him from laying the dung upon the land in due time, the next method to be taken is, to ſcatter all over the corns before you ſarcle them, as if you were ſowing ſeed, the duſt of the dung of the poultry-coops and aviaries; but, if you have not this, you muſt throw goats dung with your hand, and then, with hoes, mix it throughly with the earth. This makes corns thrive exceedingly. *Sarculis in Latin*

Nor muſt the Huſbandman be ignorant, that as land, which is not dunged, grows cold, ſo that, which is too much dunged, is burnt up; and that it is more for the advantage of the Huſbandman to do this rather frequently than immoderately. Nor is it to be doubted, but watery land requires a greater plenty, and that which is dry a leſſer quantity of it; the one, becauſe, being chilled with continual moiſture, it is thawed by applying this to it; the other, becauſe, being warm of itſelf, and, by reaſon of the droughts, when it has aſſumed a larger quantity of it, is intirely parched: for which reaſon ſuch kind of ſtuff muſt neither be given it too ſparingly, nor yet in too great plenty. If nevertheleſs you are provided with no kind of dung, it will be of great advantage to it to do, what I remember *Marcus Columella* my uncle, a moſt learned and diligent Huſbandman, was frequently wont to do; *viz.* to throw chalk or marle upon ſuch places as abound in gravel; and to lay gravel upon ſuch as are chalky, and too denſe and ſtiff: and thus he not only raiſed great plenty of excellent corn, but alſo made moſt beautiful vineyards; for this ſame moſt ſkilful Huſbandman denied, that dung ought to be applied to vines, becauſe it would ſpoil the taſte of the wine; and thought, that ſtuff gathered together out of thickets, and from among briars and thorns, or, in a word, any other ſort of earth fetched from any other place, and carried to them, was much better for making a plentiful vintage.

But now indeed I am of opinion, that ſuppoſing the Huſbandman were deſtitute of all theſe things, yet certainly the moſt expeditious and ready aſſiſtance of lupins can never be wanting to him, which, when he ſcatters them upon poor land about the thirteenth of *September*, and plows them in, and then, in due time, cuts them down, either with the plough-ſhare, or the ſpade, will have as good effect as the beſt and ſtrongeſt dunging whatſoever. But, in gravelly lands, lupins muſt be cut down after they have put forth their ſecond flower; and, in lands which are full of red earth, after the third flower. There they are turned up while they are young and tender, that they may quickly rot; and here when they are grown ſtronger, that they may bear up and keep the more ſolid and ſtiff clods of earth the longer ſuſpended, that

theſe, being heated and dried up with the ſummer ſuns, may be opened, and reſolved into duſt.

CHAP. XVII.

After what manner arable Lands may be reduced into Meadows.

AND theſe things the plower may be able to effectuate, if he not only makes proviſion of the ſeveral ſorts of fodder I have mentioned, but alſo of a great plenty of hay, that he may better ſupport and maintain his oxen, without which it is difficult to labour the ground conveniently and to advantage: and therefore the culture of the meadow, to which the antient *Romans* gave the precedence in agriculture, is alſo neceſſary for him. Alſo they gave it its name *pratum* (1), from its being preſently ready, and becauſe it did not require much labour. *Marcus Porcius* (2) did alſo make mention of thoſe farther advantages; *viz.* that it would not be afflicted with ſtormy tempeſtuous weather as other parts of the farm; and, ſtanding in need of very little expence, would yield a very good income every year, and that not of one particular ſort only, becauſe it would yield no leſs in paſturage, than in hay: therefore we take two kinds of it into conſideration, of which the firſt is naturally dry, and the other well watered.

In a rich and fat champain land, a conſtantly running rivulet is not wanted; and the hay, which grows naturally in a juicy ſoil, is reckoned better than that which is forced by conſtant watering, which nevertheleſs is very neceſſary, if the leanneſs of the ground requires it; for a meadow may be made both in ſtiff and denſe land, and alſo in that which is looſe and open, tho' it be poor, if we have the conveniency of watering it. And it neither ought to be a plain of a hollow ſituation,

(1) *Pratum, quaſi paratum*, always ready at hand, or becauſe it was, as it were, a certain yearly income, that could be moſt depended on.

(2) *Marcus Porcius Cato*, in his firſt book, places the meadow in the fifth place only; ſo that, by his ſetting ſuch a value upon meadow and paſturage, and yet not placing them in the firſt place, we may obſerve, that, when he enumerates the things, which one who purchaſes a manor ought principally to have in his eye, he does not rank them according to the value he ſet upon the things themſelves; otherwiſe he would not have placed his willow-groves before the olive-yard or the corn-field. *Tully*, in his iid book *de officiis*, and *Columella*, in his preface to his vith book, ſeem to ſay, that he gave the preference to paſturing of cattle; and yet, as is ſaid, in his own book, he places it in the fifth place; ſo that, it ſeems, he had no regard to the value of things in ranking them.

nor

nor upon a very ſteep hill; not the former, leſt it contain too long the water that gathers in it; nor the latter, leſt it pour it off headlong in an inſtant. Nevertheleſs land that ſhelves gently, if it is either fat, or well watered, may be reduced into meadow; but ſuch a level ground is moſt approved, which, having a very ſmall gentle deſcent, does not ſuffer the ſhowers, nor the rivulets that flow into it, to abide long in it; or, if any water comes upon it, it creeps off ſlowly: therefore, if in any part it be low and marſhy, and the water ſtagnates upon it, it muſt be carried off by furrows; for either great abundance, or ſcarcity of water, is equally pernicious to graſs of all ſorts.

CHAP. XVIII.

After what manner Meadows, when they are made, muſt be cultivated.

BUT the culture of meadows is more a buſineſs of care, than of labour. The firſt and principal thing is, that we don't ſuffer plants with ſtrong roots, or thorns, and herbs that grow up to a greater ſize, to remain in them; and that we extirpate ſome of them during the autumn, and before winter, ſuch as *bramble-buſhes*, *ſhrubs*, *ruſhes*; and pluck up others of them in the ſpring, as *endive* and *thorns*, that grow up about the time of the ſolſtice; and that we neither allow a hog to feed therein, becauſe, with its ſnout, it digs up and raiſes the turf, nor larger cattle, unleſs when the ground is exceeding dry, becauſe they ſink their hoofs into it, and bruiſe and cut the roots of the herbs. Moreover, in the next place, the leaner and pendent places muſt be aſſiſted and refreſhed with dung in the month of *February*, during the increaſe of the moon. All the ſtones, and if there be any other things, that lie in the way of the ſithe, ought to be gathered together, and carried to a great diſtance out of the ground, and the meadows ſhut up, and left to grow, either ſooner or later, according to the nature of the places.

There are alſo ſome meadows all covered over with naſtineſs, for want of draining, and other neceſſary culture, and with old or coarſe thick moſs, which Huſbandmen uſe to cure, by throwing ſeeds from the hay-loft, or laying dung upon them, neither of which will be of ſo much benefit to it as laying aſhes very often upon it. This thing kills the moſs. Nevertheleſs theſe remedies are ſomewhat too ſlow; whereas

the moſt efficacious is, to plow up the place afreſh; but this we ought to do, in caſe we have entered into the poſſeſſion of meadows already made to our hand; but, if we muſt either make new ones, or reſtore thoſe that are old, (for there are many of them, as I ſaid, which, thro' negligence, fail and decay, and become barren) it is expedient ſometimes to plow them up, even to ſow corn upon them, becauſe ſuch land, after lying long idle, brings a plentiful crop of corn.

Therefore, having plowed up in ſummer the place we have deſtinated for a meadow, and manured it over and over again, during the autumn we will ſow it with turneps, or navews, or even with beans; then the following year with corn. The third year we will plow it carefully, and intirely root out all the ſtronger herbs, bramble-buſhes, and trees, that ſtand here-and-there in our way, unleſs that the advantage we reap by the trees, that are planted there, hinders us to do this. Then we will ſow tares upon it, mixt with ſeeds of hay; then, with hoes and rakes, we will open and break all the clods; and level it, by drawing a hurdle or harrow over it; and diſſipate all the hillocks, which, for the moſt part, the harrows make at the turnings; ſo that the mower's ſithe may no-where ſtrike againſt any thing.

But it is not proper to cut down theſe tares before they be fully ripe, and have dropped ſome of their ſeeds upon the ground that lies under them. Then we muſt bring in the mower and the hay-maker, and, after the graſs is cut down, bind it up in bundles, and carry it out of the ground. Then we muſt water the place, if we have the convenience of water, provided the earth be denſe, and cloſer than ordinary: for, where the ground is open and looſe, it is not expedient to convey a great quantity of water into it, before the mould is condenſed, and bound together with the herbs; becauſe the force of the waters waſhes away the earth, and, by uncovering the roots of the graſs, does not ſuffer it to grow up: for this reaſon indeed we ought not to put cattle into meadows that are yet young and tender, and ſubſiding, but, with the ſithe, cut down the graſs when it ſprings up; for, as I have already ſaid, the cattle faſten their hoofs into the ſoft ground, and, bruiſing and breaking the roots of the herbs in two, hinder them to ſpread gradually, and condenſate it. Nevertheleſs, the ſecond year we will allow ſmaller cattle to be admitted, after the hay harveſt is over, provided the dryneſs and condition of the place will ſuffer it. Then the third year, when the meadow is become more hard and ſolid, it may receive greater cattle alſo.

But, upon the whole, care muſt be taken, that, at the time when the weſtern winds begin to blow, about the thirteenth of the month of *February*,

February, the grounds that are leaner, and lie higher, be dunged, and that there be hay-ſeeds mixed with the dung; for a higher riſing ground yields nouriſhment alſo to thoſe grounds which lie below it, when a ſhower coming ſuddenly upon it, or a rivulet carried through it, or water conveyed into it by hand, draws the juice of the dung along with itſelf into the lower part; and therefore prudent Huſbandmen, even in plowed lands, commonly lay more dung upon a hill than a valley, becauſe, as I ſaid, the rains always carry the fatter matter down to the lower grounds.

CHAP. XIX.

After what manner Hay ought to be managed, when it is cut down; and how it ought to be laid up.

BUT it is beſt to cut down hay before it begins to wither; for you gather a larger quantity of it, and it affords a more agreeable food to cattle. But there is a meaſure to be obſerved in drying it, that it be put together neither over-dry, nor yet too green; for, in the firſt caſe, it is not a whit better than ſtraw, if it has loſt its juice; and, in the other, it rots in the loft, if it retains too much of it: and often, after it is grown hot, it breeds fire, and ſets all in a flame. Sometimes alſo, when we have cut down our hay, a ſhower ſurpriſes us. But, if it be throughly wet, it is to no purpoſe to move it while it is wet; and it will be better, if we ſuffer the uppermoſt part of it to dry with the ſun. Then we will afterwards turn it, and, when it is dried on both ſides, we will bring it cloſe together into cocks, and ſo bind it up in bundles: nor will we, upon any account, delay to bring it under a roof: or, if we cannot conveniently either carry the hay into the manor-houſe, or bind it up in bundles or truſſes, it will certainly be proper to build it up in ricks, whatever part of it ſhall be dried in the manner it ought to be, and to form them into very narrow ſharp points; for thus the hay is commodiouſly preſerved from rains; and, tho' there ſhould be none, yet it is not amiſs to make the foreſaid ricks, that ſo, if there be any moiſture in the herbs, it may ſweat out, and be dried up in the ſtacks: for which reaſon prudent Huſbandmen, tho' they have already brought it under a roof, don't preſently ſtow it, and put it up in mows, before that they ſuffer it to heat, and concoct itſelf, and then grow cool, after

having thrown it looſely together for a few days. But now, after the hay-making, follows the care of the harveſt.

CHAP. XX.

Of making and putting a Threſhing-floor into due Order.

LET the threſhing-floor alſo, if it be of earth, and not paved, that it may be fit for threſhing upon, be firſt pared, then delved, and ſmeared over with lees of oil, which have never been ſalted, and chaff, throughly mixed together; for this preſerves the corns from being plundered by mice and ants. Then let it be levelled, and beaten cloſe with rammers, or with a mill-ſtone; and let chaff be again thrown upon it, and trodden into it; and ſo let it be left to be dried by the ſun.

Nevertheleſs there are ſome, who rather order a certain quantity of the beans, that grow at a ſmall diſtance, to be threſhed; and, after they have cut down and gathered the beans, they ſmooth and prepare the place for a threſhing-floor: for, while the cattle tread out the pulſe, they alſo bruiſe the herbs and weeds with their hoofs; and ſo the place grows bare and ſmooth, and becomes a threſhing-floor fit for threſhing any thing whatſoever upon.

CHAP. XXI.

Of reaping Corns, and of threſhing them.

BUT, as ſoon as the corn is ripe, let it be cut down, before it be parched with the heats of the ſummer-ſun, which are exceeding great about the time that the Dog-ſtar riſes; for delaying is prejudicial to them, and occaſions great damage: firſt, becauſe it gives the corn as a prey to fowls, and other animals; next, becauſe the grain, and even the ears themſelves, quickly fall down from the withered ſtalks and beards. But, if ſtorms of winds, or whirlwinds, ſhould ſurpriſe us, the greater part of it falls to the ground: for which reaſons, no further delays ought to be made, but, when the corns are all over equally yellow, before the grains be intirely hardened, when they have contracted a reddiſh colour, you muſt begin to reap, that ſo the corns may rather grow big in the threſhing-floor, and in the ſtacks, than upon the

the corn-fields; for 'tis certain, if they be cut down in due time, they afterwards grow ſomewhat bigger. And there are ſeveral ways of reaping corn: many cut the ſtraw by the middle with ſmall cradle-ſithes (1), or with ſickles; and theſe are either made with a beak, or dented. Many gather the ears themſelves with forked irons (2), others with ripples or combs (3); and this is very eaſy where the corn is thin, but moſt difficult where it is thick. But if the corn, with a part of the ſtraw, is cut down with ſickles, it is preſently put together in a heap, or carried under a ſhed; and, being ſcorched from time to time with the ſun, as opportunity offers, it is threſhed. But, if only the ears of the corn are cut off, they may be carried into the barn, and then, in winter, beaten out either with ſtaffs or flails, or bruiſed out with cattle.

But, if you have the conveniency of threſhing the corn in a threſhing-floor, there is no manner of doubt, but that buſineſs may be better

(1) Our author mentions four different ſorts of reaping inſtruments, of which he gives no ſuch particular deſcription, as to make us exactly underſtand their figure. The *falces* were of different ſizes, according to the uſes to which they were applied; and *falx* ſeems to ſignify both a *ſithe* and a *ſickle*. It is probable they bore a great reſemblance to thoſe ſtill in uſe, tho' the ſickles ſeem not to have been ſhaped ſo much like a creſcent as moſt of the modern ones are. It is not eaſy to tell what our author means by *falces verriculatæ*, or what analogy there can be between *falx* and *verriculum*, which properly ſignifies a *drag* or *ſweep-net*; and therefore it is very probable, that the true reading is *vericulatæ*, which is as naturally formed from *vericulum*, the diminutive of *veru*, as *geniculatus* from *geniculum*, the diminutive of *genu*, and ſome other words of the like formation. If ſo, then theſe *falces vericulatæ* did certainly reſemble what they call cradle-ſithes, which are much in uſe in *Kent*, and other places; and as theſe are framed of one or more long ſmall pieces of wood, ſhaped and pointed at one end like a ſmall ſpit (*vericulum*), which being ſo fixed in a ſmall frame of wood, which riſes out of the lower end of the handle, near where it is joined to the ſithe, as to run parallel to the ſithe, and placed at a ſmall diſtance the one little ſpit above the other, they ſerve to ſupport the ſtalks of corn when cut with the ſithe, and keep them from falling backward towards the ſtanding corn, till, by the ſwing of the ſithe, they are thrown off towards the left-hand, where they lie in due order out of the way of the mower. It is not at all improbable, but this inſtrument, as moſt other things relating to Husbandry, might originally come from the *Romans*; and that thoſe *falces vericulatæ*, mentioned by our author, might have been framed very near after the ſame manner, but of a much ſmaller ſize, if they were uſed in *Italy*, where *Pliny* ſays, *feniſex dextra una manu ſecat*; but here he inſinuates, that they managed the ſithe with both hands in other countries. The ſickles he diſtinguiſhes into two ſorts, ſome with teeth, others beaked; both which ſorts are ſtill in uſe.

(2) The third inſtrument for reaping was the *merga*, by *Pliny* called *merges*, which no doubt took its name, as *Feſtus* ſays, from fowls, which dive into the water, and riſe up again in a different place; for, as theſe dive in purſuit of the fiſh, ſo the reapers plunge this ſmall forked inſtrument into the corn, that they may lift up handfuls of it.

(3) The fourth reaping tool was the *pecten*, a comb or heckle. *Pliny* ſays, that the ears of corn were cut away with this hand-heckle or comb put under them, juſt as they do with mens hairs when they poll them; and he ſeems to inſinuate, that, when the ſtraw was cut in the middle, the ears were ſtripped off *inter duas mergites*, between two forked inſtruments. They made uſe of theſe forked inſtruments both to gather the ears, and to throw the corn into heaps.

done with horſes, than with oxen; and, if you have but few pairs or yokes of them, you may make uſe of the cart or dray made of rough boards, or of a ſlead (4); both which very eaſily bruiſe the ſtraw: but it is better to beat out the ears themſelves with cudgels or flails, and to cleanſe them with fans; but, when the corns are mixed with chaff, let them be ſeparated with the wind. The weſt wind, which blows gently and equally in the ſummer months, is reckoned excellent for this purpoſe: nevertheleſs to wait for it is a ſign of a ſlow dilatory Huſbandman; for, while we are waiting for it, a hard winter overtakes us: therefore, after the corns are threſhed, they muſt be laid in heaps upon the threſhing-floor in ſuch a manner, as they may be winnowed with any breeze. But if, for many days, the wind is ſilent on every ſide, let them be cleanſed with fans, leſt, after the winds have been exceſſively dull, a vaſt ſtorm deſtroy, and render uſeleſs, the labour of the whole year. Then the pure corns, if they are laid up for years, ought to be winnowed a ſecond time; for, the cleaner they are, the leſs will they be eaten up, and deſtroyed by wevils. But, if they be deſigned for uſe immediately, it is to no purpoſe to cleanſe them a ſecond time; it is ſufficient to cool them in the ſhade, and ſo bring them into the garner. Alſo no other care is to be taken of legumes, than of other ſorts of corn; for thoſe likewiſe are either for preſent conſumption, or are laid up in ſtore. And this reaping and gathering in of the harveſt is the ſupreme and ultimate advantage and gain, which the plower propoſed to himſelf, when he committed the ſeeds to the earth.

(4) *Trahæ* was a kind of dray made of boards full of teeth, with ſmall wheels, which was drawn over the threſhing-floor, in order to beat the corn out of the ears.

Tribulum, or *tribula*, was a plank ſtuck full of ſmall flint-ſtones or iron, upon which they placed a great weight, and drew it with horſes over the corn, which they had placed regularly upon the threſhing-floor. Sometimes the driver ſat upon it, and drove the oxen or horſes backward and forward, and, partly by the feet of the oxen and horſes, partly by the weight and friction of the machine, the grains were ſoon ſeparated from the ears; and the ſtraw was drawn by the teeth ſtuck in the planks, and by the ſmall wheels, to the ends of the threſhing-floor. This was the way of threſhing in the eaſtern countries, as alſo among the *Romans*, *Varro*, *lib.* i. *cap.* 52. See alſo the prophet *Iſaiah*, chap. xxviii. ver. 26. wherein there is mention made of the different ways of threſhing. It was the cuſtom in thoſe days to threſh their corns in the fields, as they do at preſent in many hot dry countries, as ſoon as they are cut down.

CHAP.

CHAP. XXII.

What Things a Husbandman may lawfully do upon Holidays, and what not.

BUT foraſmuch as our anceſtors thought it highly reaſonable to give as ſtrict an account of their idle and ſpare time, as of their time for buſineſs; we alſo think it proper to admoniſh Huſbandmen what things they ought, or ought not to do, upon holidays; for there are certain things, which, as the poet ſays (1),

'Both civil and religious laws allow
'On feſtivals. No ſacred laws forbid
'To drain our lands, or waters to diſpenſe,
'Or with a hedge our corn-fields to ſurround;
'For birds hid ſnares to lay; to burn up briars;
'And bleating flocks in healthful ſtreams to plunge.'

Tho' the *Pontiffs* (2) deny, that we ought to make hedges round our corn-fields on holidays, they alſo forbid us to waſh our ſheep upon the account of the wool, but only by way of phyſic. *Virgil* has inſtructed us upon what conſiderations it may be lawful to waſh a flock in a river upon holidays; and therefore added, *in healthful ſtreams to plunge*; for there are diſeaſes, upon the account of which, it may be of great advantage to bathe the cattle.

But the cuſtoms and rites of our anceſtors allow alſo thoſe things to be done on holidays; *viz. to bray husked and bearded wheat in a mortar*;

(1) *Virgil. Georg. lib.* i. 268.

(2) *Pontifices.* The Pontiffs were a college of prieſts firſt inſtituted by *Numa*, who choſe them out of the ſenators. They were, at firſt, only four in number, but afterwards increaſed to eight, and then by *Sylla* to fifteen. Their office was to give judgment in all religious cauſes, and to inſpect the manners of the inferior prieſts, and puniſh them when they ſaw occaſion; to preſcribe rules for public worſhip; to regulate the feſtivals, ſacrifices, and all other things relating to religion. The maſterſhip or headſhip of this college was one of the moſt honourable offices in the commonwealth; and *Numa* inveſted himſelf therewith. *Julius Cæſar*, *Auguſtus*, and moſt of the ſucceeding Emperors, exerciſed this office; and no wonder, conſidering the great dignity and power annexed to it, he being looked upon as the ſovereign judge and arbitrator in all things both divine and human. The college had power to inſtitute new religious rites and ceremonies, and were conſulted by the people upon all religious occaſions. See *Dionyſius Halicarnaſſeus*, and *Cicero*, in his oration for his own houſe. The head of the college was called *pontifex maximus*, not from his age or precedency, but from his power and authority.

to cut torches; *to make tallow-candles*; *to cultivate a hired vineyard*, or which we have undertaken to dreſs at a certain price; *to purge and cleanſe fiſh-ponds*, *ponds*, *and old ditches*; *to mow meadows a ſecond time*; *to ſpread dung*; *to lay up and ſtow hay in the hay-lofts*; *to gather the fruits of an olive-yard*, which we have hired, or undertaken to manage at a certain price; *to ſpread apples*, *pears*, *and figs*; *to make cheeſe*; *to bring home trees*, *either upon our ſhoulders*, *or upon a pack-mule*, *in order to plant them:* but we are not allowed to carry them with one that is yoked in a cart or a waggon, nor to ſow or plant any thing, that we have brought home, nor to open the ground, nor to prune or lop trees; but you muſt not ſo much as do any thing relating to ſowing, unleſs you have firſt ſacrificed a puppy; nor cut hay, nor make it up in truſſes, nor carry it home: nor is it lawful, according to the religious ſyſtems of the Pontiffs, to gather the vintage upon holidays, nor ſhear your ſheep, till you have firſt offered a puppy in ſacrifice.

It is lawful alſo to make rob of grapes, or ſodden wine, by boiling the muſt in to one third of the firſt quantity, and to mix it with the wine (3). It is alſo lawful to gather grapes and olives for preſerving. But it is not lawful to cloathe the ſheep with ſkins. Whatever you do in your garden, relating to pot-herbs, is allowed; and, upon public holidays, it is not lawful to bury a dead man. *Marcus Porcius Cato* (4) ſaid, that there were no days of vacation for mules, horſes, and aſſes. The ſame author allows us to yoke oxen, in order to bring home wood and corn. We read in the books of the Pontiffs, that, only upon ſuch holidays as were obſerved in private families on the tenth day after the death of any perſon (5), it is not lawful to yoke mules; but, on other holidays, it is allowed.

I am perſuaded, that, in this place, ſome perſons, after I have reckoned up the ſolemn feaſts, will deſire to know the cuſtom obſerved by the antients in their luſtrations which they made, and ſacrifices which they

(3) *Defrutum*. I believe this word might properly enough be rendered *rob of grapes*, if any ſort of rob be made without ſugar. However, the thing is this: The antient *Romans* uſed to take a certain quantity of their beſt and ſweeteſt muſt, and boil it in to a certain quantity. What they boiled in to one half of the firſt quantity, they called *ſapa*; and that which they boiled in to one third, they called *defrutum*. With it they mixed and boiled ſeveral ingredients. This *defrutum* or *ſapa* they applied to ſeveral uſes, but chiefly they uſed it for preſerving their wines, fruits, *&c.* They thought, that a certain quantity contributed much to preſerve their wines from ſpoiling. They alſo made uſe of them for curing ailments both of men and cattle, as we ſhall ſee in the ſequel of this work.

(4) *Cato*, *cap.* 138.

(5) *Feriæ denicales*. Theſe were holidays kept by private perſons upon the tenth day after the death of any perſon in the family. They fanſied, that the houſe was polluted by the dead body, and they were wont to make uſe of certain religious rites and ceremonies to purge the ſame.

offered

offered for the fruits of the earth (6); nor do I refuſe to be at the trouble of inſtructing them in theſe things: but I put it off to the book I deſign to compoſe, after I have done writing upon the whole art of Huſbandry. In the mean time I ſhall put an end to the preſent argument, and, in the next book, ſhall give an account of what antient authors have written concerning vineyards, and plantations of trees for ſupporting vines, and what I myſelf have ſince found out by my own experience.

(6) It was the cuſtom of the *Romans*, at certain times of the year, to lead ſacrifices round their fields with great ceremony and attendance, and afterwards to offer them up to *Ceres*, or ſome other of their gods, with prayers, that they would preſerve the fruits of the ground from thunder, lightning, ſtorms, mildew, and all other plagues and misfortunes whatſoever. Private perſons uſed always to luſtrate their lands; and a part of their prayer to their gods was, that they would avert all peſtilence, barrenneſs, *&c.* and proſper the culture of their lands, *&c.* Our author deſigned to write upon this ſubject; whether he did ſo, or not, I know not. If he did, I ſuppoſe nothing of it is come to our times.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK THIRD.

CHAP. I.

What Kind of Vine may be proper for every Soil, and ſuitable to the State of the Climate.

THUS *far of tillage*, as ſaith that moſt excellent poet (1); for nothing hinders us, *Publius Silvinus*, who are going to ſpeak of the ſame things, auſpiciouſly to begin with the firſt words of that moſt renowned poem. The care of trees follows, which is even the greateſt part of Huſbandry. There are divers ſpecies of them, and of very different appearances; for there are ſeveral ſorts of them, which (as the ſame author (2) tells us) *come of their own accord, no man compels.* Many of them alſo, after being planted with our own hand, grow up. But ſuch of them, as are not produced by human aſſiſtance, are wild and ſavage, and bear apples or ſeeds agreeable to their ſeveral natures. But ſuch of them, as have labour beſtowed upon them, are fitteſt for producing fruit proper for food.

We muſt therefore ſpeak firſt of that kind, which affords us nouriſhment; and it is divided into three different ſorts: for, from a ſprig, or ſhoot, or cutting, there proceeds either a tree, as the *olive*; or a ſhrub, as the champain *palm* (3); or a certain third thing, which I cannot pro-

(1) *Virg. Georg. lib.* i. 1.
(2) *Virg. Georg. lib.* ii. 10.
(3) *Palma campeſtris*, a champain palm. *Pliny*, in his *nat. hiſt. lib.* xiii. *c.* 4. mentions a ſort of a palm-tree, that does not exceed a ſhrub.

perly call either a tree or a ſhrub, as is the *vine* (4). This, with very good reaſon, we prefer to all other ſtems whatſoever, not only for the ſweetneſs

(4) All the antient ruſtic authors agree, that there is ſo great a variety in vines, that it would be both vain and unprofitable to attempt to enumerate or deſcribe the different ſorts of this uſeful and delightful little tree; ſo that they have only taken notice of ſome of the moſt commendable, which they have ranked into a few claſſes, according to their ſeveral characters. *Pliny* has indeed mentioned a great many in his *natural hiſtory*; but *Virgil* thought it enough to give a place in his admirable poem only to fifteen of them. Our author has ranked them in three claſſes, and has mentioned about fifteen of the firſt note, about twelve of the ſecond, and ſeven or eight of the third note; but, of ſome of the ſame claſs and name, he makes different ſorts, which have ſome peculiarity or other to diſtinguiſh them from each other, though they may ſeem to be the ſame to a ſuperficial obſerver. He alſo mentions a few, to which he has aſſigned no claſs. Of all the different ſorts, there are not many, which theſe authors have ſo particularly deſcribed, as to enable even a curious obſerver to diſtinguiſh and know them at preſent; for many of them they juſt name, with the character of being fruitful, early or late ripe, thriving in ſuch and ſuch a ſoil and weather, *&c.* without giving any particular deſcription of their wood, leaves, flower, fruit, *&c.* as are neceſſary to make them eaſy to be known to after-ages. Some of their names indeed denote ſome eſſential character, which diſtinguiſh them from all others; but theſe are but few. Many of them bear the names of the places where they were firſt known to grow, or did moſt abound, or of the perſons who firſt brought them into *Italy*, and cultivated them; but, as they have now loſt their names, there is but little knowledge can be gathered from moſt of them. And it is remarkable, that, even in *Italy* itſelf, where all theſe vines were cultivated in great abundance in our author's days, and where, no doubt, many of them ſtill ſubſiſt, yet very few, if any, retain their antient names; ſo that the language of the *Romans* has not ſuffered a greater change in any part of it, than in the names of vines; ſo that it is not now eaſy to determine to which of the vines now growing the antient names belong. A few of them indeed are ſo exactly deſcribed by *Pliny* and this author, that one cannot miſtake, though they are now called by different names.

It is probable, that thoſe vines, which are not particularly deſcribed, were ſo well known, that it was ſufficient only to name them, and nothing more was needful but to relate ſome of their particular qualities: and the chief deſign of *Columella* ſeems to have been to point out to the Husbandman, which of them were fitteſt for his purpoſe, and which not, and the manner of their cultivation; and ſuch of them, as he has more accurately deſcribed, ſeem not to have been ſo generally well known, and were cultivated only in few places, where the ſoil was moſt agreeable to their nature.

From the elegant deſcription he has given us of many, if not of all, the moſt commendable ſorts, we have an opportunity to obſerve and admire the beautiful and ſurpriſing variety, that there is in this one ſmall tree or ſhrub, whatever we pleaſe to call it; which is ſo great, that I know not if there be the like in any other tree or ſhrub whatſoever: for tho' all the various ſorts agree in many eſſential things, which diſtinguiſh them from all other trees or ſhrubs whatſoever, and from which they all have the general appellation or name of *vines*, yet each of them has ſome remarkable character, which confines them to a certain *ſort*, and diſtinguiſhes them from all others. Thus we ſee, that our author tells us, that ſome are exceeding fruitful; others produce tolerably well; others little or nothing; ſome are afraid of fogs, froſts, hoar-froſts, others not; ſome are early ripe, others ripen late; ſome loſe all their fruit in the bloſſom, others caſt their bloſſoms exceeding well; ſome are brittle, and eaſily broken by the winds; others of them are ſo ſtrong and tough, that they ſuffer nothing from them; ſome of them dread rains, others are afraid of dry weather; ſome of them have frequent joints and knots, others but few, and diſtant from each other; ſome have long and thick branches and ſhoots, others have them ſmall, and few of them; ſome of them have a large pith, others have it very ſmall; ſome of them

ſweetneſs of its fruit, but alſo for that facility, wherewith it anſwers the pains that mortals beſtow upon it, almoſt in every country, and in every latitude of the world, except in the frozen or the torrid zones; and it grows as happily in plains as upon hills, and thrives as well in denſe thick ground, as in that which is looſe and open; and often alſo in land that is poor, as in that which is fat; and in a dry ſoil, as well as in that which is naturally moiſt; and it alone does beſt endure both the one and the other intemperature of weather, either under a cold, or under a ſcorching hot or ſtormy climate.

Nevertheleſs it is of great importance what kind, or what quality and habit the vine is of, which you reſolve to cultivate, according to the ſtate and condition of the country; for neither is the culture the ſame in every climate and ſoil, nor is this ſtem of one and the ſame kind; and which of them all is the chief, it is not eaſy to tell, ſince experience teaches, that every country has its own, which is more or leſs proper for it. Nevertheleſs a prudent Huſbandman will eaſily find out, that that kind of vine is proper for a plain, which endures fogs and hoar-froſts, without receiving any hurt; and for a hill, that which can bear drought and winds. To a fat and fertile land, he will give a ſmall ſlender vine, and which is not naturally too fruitful; to lean ground, he will give a vine that bears great plenty of fruit; to denſe and thick land, one that ſhoots out vehemently, and puts forth abundance of hard wood and leaves; to a looſe, open, and rich ſoil, one that is thin of ſprays and twigs. He will know, that a vine of a tender fruit, and of a grape of a larger ſize, is not rightly committed to a moiſt place, but one of a callous, narrow, ſlender fruit, and full of grape-ſtones; and that, to a dry place alſo, plants of a different nature are rightly appropriated.

But, beſides theſe things, the proprietor of the place will not be ignorant, that the quality of the climate, hot or cold, dry or dewy, ſubject to hail and wind, or calm, ſerene, or foggy, is of much greater influence than any other thing: and to a climate of a cold or foggy conſtitution he will adapt two ſorts of vines, either ſuch as are early ripe,

have their leaves cut very deep, others but very little cut, and in a different manner, and others of them are not cut at all, but intirely round; ſome bear white, ſome red, others black grapes, and the bunches and grains of different ſizes and ſhapes; ſome have berries very callous, ſome ſoft, ſome hard; ſome of them have them very beautiful and bright, and others dark; ſome ſweet, others acid; ſome produce durable wines, others that which ſoon corrupts: with many other varieties too tedious to relate.

Pliny, in his *natural hiſtory*, ſays, that the antients reckoned vines amongſt trees; and that there was a ſtatue of *Jupiter* in a town of *Tuſcany* made of a vine. He mentions alſo a temple of *Juno*, ſupported by pillars made of vines; but he ſuppoſes they were wild vines; and that no wood is ſo durable.

whoſe

whoſe fruit comes to maturity before winter, or thoſe of a firm and hard grape, whoſe cluſters caſt their bloſſoms in the midſt of the fogs, and afterwards ripen and grow mellow with the hoar-froſts and froſts, as other grapes do with the heats. Alſo in a climate of a windy and tumultuous conſtitution, he will, with confidence, commit to the ground ſuch as take firm hold of it, and bear hard grapes. Again, to a warm climate he will entruſt ſuch as are more tender, and abound in fruit. To a dry he will deſtinate ſuch as rot with rains and continual dews; to a dewy, ſuch as ſuffer by droughts; to a climate ſubject to hail, ſuch as grow with hard and broad leaves, that they may protect the fruit the better; for there is no ſort of vine that a calm and ſerene climate does not admit, but moſt commodiouſly that, whoſe bunches, or ſingle grains, quickly fall off.

But if a place for vineyards, and the ſtate of the climate, were to be choſen according to your wiſh, as *Celſus* judges very truly, that ground or ſoil is the beſt, which is neither too denſe, nor too looſe and open, nevertheleſs approaches more to that which is looſe; neither poor nor exceeding rich, but which is next to that which is very fruitful; neither champain nor ſteep, nevertheleſs like to a riſing high ground; neither dry nor naturally wet, nevertheleſs moderately moiſtened with dew; which does not flow with ſprings, either upon the ſurface, or deep below ground, but that it convey to, and ſupply the roots of the vines with the neighbouring moiſture; and that that be neither bitter nor ſaltiſh, leſt it corrupt the taſte of the wine, and check the growth of every green thing with a certain rough ſcabby ruſt, as it were, if ſo be we believe *Virgil*, who ſays (5),

'A ſalt and bitter land in all its fruits
'Unhappy proves; nor can the lab'ring plough
'Its rugged nature tame, and make it mild.
'There *Bacchus'* favourite plant, the fruitful vine,
'Does loſe its kind, and apple-trees their names.'

Moreover, as I ſaid before, a vineyard neither requires a cold icy climate, nor, on the other hand, one that is ſcorching hot; nevertheleſs it rejoices and thrives better in a warm than in a cold climate, and is offended and ſuffers more hurt by rains, than by fair weather, and is more friendly to a dry ſoil, than to that which is too much expoſed to rain. It rejoices in gentle and moderate paſſing gales, and is liable to ſuffer by

(5) *Virg. Georg. lib.* ii. 238.

tempeſtuous ſtormy weather. And this is the quality both of the climate and ſoil, which is the moſt to be approved.

CHAP. II.

What Vines muſt be planted for Food in Lands near the City.

THE vine is planted either for food to eat, or for a liquor to drink. It is not expedient to inſtitute vineyards for food, unleſs when the land is ſo contiguous to the city, that it may turn to as good account to ſell the fruit thereof to ſuch as buy it before we bring it into our ſtorehouſe, as we do apples (1); and, when this is the caſe, the early ripe vines, and ſuch as bear firm and hard grapes, with thick tough ſkins, and then the purple-coloured, and the *Bumaſt* (2) and date-like grapes (3), and the *Rhodian*, *Libyan* (4), and the *Ceraunian* (5) alſo, ought eſpecially to be planted; and not only ſuch as can be commended for their excellent taſte, but alſo for their beautiful appearance, as the coronary (6), the three-feet-long (7), the uncial (8), and the

(1) *Veluti promum*. Some editions have *pomum*, and I have tranſlated it accordingly; and the meaning is, that it is expedient to plant vineyards for food, if we can as eaſily ſell our grapes to huckſters and others, as we do our apples, pears, *&c.* Other copies have *promum*. If this is the true reading, then the meaning of the author is, that it is not expedient, unleſs we can ſell the fruit thereof as eaſily before we bring it into our ſtorehouſes, as we do our other fruits, when we bring them out of the ſame; and then *promus* is an adjective in this place, and *fructus promus* will ſignify fruit laid up in ſtore, and afterwards brought forth for uſe, or to ſell, *&c.*

(2) *Bumaſti* are vines which produce cluſters of grapes, like cows udders or dugs. *Varro*, *lib.* ii. *c.* 5. calls this ſort of grape *uvam bumammam*. Bi, added to any word, increaſes the ſignification of it; and, as this author ſays, moſt part of great things are expreſſed by the addition of this word, which is owing to the great value they anciently put upon this uſeful animal: and this ſort of vine was probably ſo called, from the cluſters of grapes reſembling a cow's udder and dugs, both in their bulk and ſhape. Some think, that the berries were round and ſwelling, and therefore ſo called.

(3) *Dactyli*, date-like grapes, ſhaped like a date, or ſmall and long like the finger. The *French* call them *raiſins au long grain*.

(4) *Rhodiæ & Libycæ vites*. Theſe vines have their names from the countries whence they were brought into *Italy*.

(5) *Ceraunia*. *Iſidorus* ſays they are ſo called from their firy colour.

(6) *Stephanitæ*, from στέφανος, a crown. *Pliny* ſays they are ſo called, becauſe they naturally grow ſomewhat like crowns or chaplets of flowers, the leaves running between the berries, as if they were artificially mixed, and made into coronets; ſo that they cannot be ſo called from the vine itſelf being twiſted and formed into the figure of a crown. Theſe grapes were alſo called *forenſes*, market-grapes, becauſe they come ſoon, are ſaleable for their beauty, and eaſy to be carried. The *French* call them *foiraus*, which, as father *Hardouin* ſays, ſeems to be the old name ſtill retained.

(7) *Tripedaneæ vites*, three feet long, ſo called from the length of their ſtock, according to *Pliny*.

(8) *Unciariæ*, by *Pliny* called *unciales*, from the weight of their berries.

quince-

quince-vines (9); as alſo thoſe vines, whoſe grapes are put up in veſſels, and are durable, and can be kept during the whole winter, as the *Venuculan* (10), as the *Numiſian* (11), which have been lately found by experience to be exceeding proper for theſe uſes.

But, when wine is what we have principally in view, we make choice of a vine, which is ſtrong and mighty both in fruit and in firm wood, becauſe the one contributes very much to the income of the Huſbandman, and the other to the durableneſs of the ſtock; but then that is the chief and the choiceſt, if it neither promiſes too quickly, and caſts its flower alſo very early in the beginning of the ſeaſon, nor ripens and grows mellow too ſlowly, and alſo eaſily repels and ſtands out againſt hoar-froſts, fogs, and blaſting, and neither rots with ſhowers, nor ſhrivels and decays with droughts.

Let us make choice of ſuch a vine as this, ſuppoſe it be but indifferently fruitful, provided the place has the reputation of producing wines of a noble and precious taſte and flavour; for, if they be of a paltry and baſe taſte, and little accounted of, it is an advantage to plant there every ſort of vine, that bears the moſt fruit, that, by the vaſt increaſe and quantity of the fruit, our revenue and yearly income may be augmented. But whatever conſtitution or quality the lands may be of, commonly champain lands produce the greater quantity of wine; and ſuch as are hilly, that which is more delicious. Nevertheleſs theſe places themſelves, in a moderate ſtate of the climate, bring a more plentiful vintage, when they decline towards the north; but the wines are more generous, when they lie towards the ſouth.

Nor is there any doubt, but ſuch is the nature of ſome vines, that, according to the ſituation of places, they either excel, or are excelled, in the goodneſs of their wine. *Aminean vines alone* (12), a too cold ſtate

(9) *Cydonitæ vites*, quince-vines, whoſe fruit had ſomewhat of the taſte of quinces.

(10) *Venucula vitis*. *Pliny* calls it *venicula*. *Horace* makes mention of the grapes of this vine as proper to be put up in pots, *ſat.* ii. 4, 71. Some think, that this word is formed of *ve*, *augendi particula*, and *nucleus*, as if it ſignified grapes with big kernels.

Pliny, *lib.* xiv. 2. gives no particular deſcription of this vine; only ſays, that it is called by different names in different places. Thoſe names ſignify very little to explain any quality peculiar to it. He adds, that they caſt their bloſſoms very well, and are proper to be put up in jars. Some think, that they are what the *Venetians* call now *marzemina*. *Pliny* ſeems to ſay, that, at *Terracina*, they took it for the *Numiſian*, which follows here.

(11) *Numiſianæ vites*. *Pliny* does not ſeem to make them to differ much from the *Venuculan*; ſays, that they have no peculiar ſtrength in themſelves, but derive all from the ſoil, according to the ſtrength and goodneſs of which they change their qualities.

(12) *Aminneæ vites*. Some write it only with one *m*. *Macrobius*, *ſat. lib.* ii. *c.* 16. ſays, that they had their name from the country where they grew, which, he ſays, was where now *Falernum* is; but father *Hardouin* corrects this, and ſays, it ought to be *ubi nunc Salentum eſt*; *viz.* the *Salentine* land, where antiently was the *Regio Peucetia*, *Plin. hiſt. nat.*

ſtate of the climate excepted, are reported to ſurpaſs all others in flavour and taſte, tho' they may degenerate, and, when compared with one another, yield wine of a more or leſs exquiſite taſte. Theſe, tho' they all bear the ſame name, yet are not all of the ſame ſort, nor have the ſame appearance. We have known two of them that are ſiſters, of which the leſſer caſts its bloſſom ſooner and better, and is fit both for the tree and the frame. Upon the tree it requires fat ground, and, on the frame, middling: and it far ſurpaſſes the greater, becauſe it endures rains and winds with greater fortitude; for the greater is quickly ſpoiled in the bloſſom, and more upon frames, than on trees. Therefore it is not fit for vineyards, and ſcarcely alſo for a place where it is ſupported by trees, unleſs it be in very fat and ouſy ground; for neither does it thrive and enjoy good health in ordinary and indifferent ground, and much leſs in that which is poor. It is known by its great number of long branches of firm wood, and by the largeneſs of its leaves, cluſters, and grapes. It is alſo thinner of joints; and the leſſer excels it in the large quantity of its fruits; but this is not inferior to it in taſte and flavour: and both theſe are indeed *Aminean* vines.

But there are two other vines, that reſemble one another, which are called the *twin-Amineans*, becauſe they put forth double cluſters. They yield a rougher harſher wine, but equally laſting. The leſſer of theſe is exceeding well known, becauſe it covers the moſt famous hills of *Veſuvius* and *Sorrento* in *Campania*. It is chearful amongſt the ſummer gales of the weſt wind; but is afflicted with ſouth winds; therefore, in the other parts of *Italy*, it is not ſo fit for vineyards as for plantations of trees made for the ſupport of vines; whereas, in the foreſaid countries, the frame moſt commodiouſly ſupports its firm woody branches, and its fruit, which it produces not unlike that of the leſſer *ſiſter-Aminean*, except that its cluſters are double, as the greater *twin-Aminean* produces alſo fruit like to the greater *ſiſter-Aminean*; which leſſer *twin-Aminean* is

nat. lib. iij. *ſect.* 16. and a part of this country was called *Aminea*. It ſeems they were firſt brought from this country to other parts of *Italy*; but they were chiefly cultivated on mount *Veſuvius*, a famous hill near *Naples*, once very remarkable for its noble wines; but now, in a great meaſure, deſtroyed, and made unfit for cultivation, by the frequent eruptions of the vulcano upon the top of it; as alſo about *Sorrento*, an antient city about 18 or 20 miles diſtant from *Naples*. The hills about it are much celebrated, both in former and later times, for the excellent wine they produce. There are ſeveral other reaſons aſſigned, why theſe vines are ſo called; but ſeem to have very little foundation. *Pliny* mentions five different ſorts of them. Our author, who gives a very diſtinct account of them, mentions a ſixth ſort, which he magnifies very much. *Servius* gives but a poor reaſon why they are called *Amineæ*, viz. *quaſi ſine mixto*, i. e. *rubere*, becauſe their wine is white; which is true of many other vines beſides theſe, and *Pliny* makes mention of a black *Aminean*.

better

better than the greater in this reſpect, that it is more fruitful in an indifferent ſoil; for we have already ſaid, that that does not anſwer but in very fat ground.

Some approve moſt of the *woolly-Aminean* vine, which does not therefore aſſume this name, becauſe it only, of all other *Aminean* vines, grows white or hoary, with a cotton or down upon it, but becauſe this eſpecially has more of it than the others. It yields indeed good wine; but lighter than thoſe others above-mentioned. It puts forth alſo a great quantity of firm wood, and therefore caſts its bloſſoms but very indifferently, becauſe of the thickneſs of its branches and leaves; and the ſame quickly rots after the fruit is ripe.

Over and above the number we have mentioned, there is an *Aminean* vine, which is reckoned ſingular, not unlike to the greater *ſiſter-Aminean*, but to be preferred to it; firſt, for the make and beautiful appearance of its ſtock, and ſhoots, and leaves; but ſomewhat inferior to it in the flavour and taſte of its wine, tho' notwithſtanding it is moſt generous. Next, it is preferable alſo upon the account of its own peculiar qualities; for it is both more fertile, and caſts its bloſſom better, and bears thick, cloſe, and whitiſh cluſters, and of a plumper and more ſwelling grape. It does not degenerate in thin poor land, and therefore it is numbered among the moſt fruitful vines.

The *Nomentan* vines (13) follow next after the *Aminean* in the nobleneſs of their wine; but, in fruitfulneſs, they even come before, or have the precedency; becauſe, as they have a numerous conception, ſo, what they have once brought forth, they preſerve and maintain exceeding well. But of theſe alſo the leſſer is the more fertile; and the leaf of it is more ſparingly cut, and its wood is not ſo red as that of the *Aminean*, from which colour they are called *rubellian*. The ſame are alſo called *dreggy* vines, becauſe they bring more dregs than other vines do. Nevertheleſs they make up this diſadvantage by the multitude of cluſters, which they produce even upon a frame, but better upon a tree. They ſuffer valiantly both winds and ſhowers, and quickly caſt their bloſſoms, and therefore ripen the ſooner, bearing with every inconveniency, except heat; for, becauſe they have cluſters with ſmall berries, and hard ſkins, they ſhrink with violent heats. They rejoice moſt in fat land, becauſe it is able to give fruitfulneſs to vines that are naturally ſmall and ſlender.

(13) *Nomentanæ vites*, vines growing about *Nomentum*, formerly a city belonging to the *Sabines*, now a village about ten miles from *Rome*, upon the river *Anien* or *Teverone*. *Pliny*, who ranks them next to the *Aminean*, ſays, that their firm hard wood was red; for which reaſon they were by ſome called *rubellæ*, red vines.

Eugenian

Eugenian vines (14) bear, without any inconveniency, with a cold and dewy ſoil and climate, ſeeing they grow on mount *Albano*; for they ſcarcely anſwer their name after they have changed their place. This is alſo the caſe with *Allobrogian* vines (15), the deliciouſneſs of whoſe wine is changed with the country.

The three *Apian* (16) vines are commended alſo for their great and excellent qualities. They are all fertile, and fit enough for both the frame and the trees; yet the one with bare leaves is more generous; for the two that are woolly, tho' they are alike in the make and ſhape of their branches, leaves, and ſhoots, yet they are unlike and different in the quality of the liquor that flows from them; for one of them is ſlower in receiving the carioufneſs of antiquity. In a fat ſoil they are exceeding fertile, and in an indifferent alſo, they are fruitful, and their fruit is early ripe; therefore they are very proper for cold places. They yield a ſweet wine; but they are not good for the head, nerves, and veins. Unleſs they be gathered in due time, they become a prey to the rains, winds, and bees; and, becauſe the bees prey upon them, and plunder them, they are ſurnamed from them.

And theſe are the vines, which are moſt celebrated for their precious taſte. Nevertheleſs vines of the ſecond note may be commended alſo for their increaſe and fruitfulneſs, ſuch as the *Bituric* (17) and the *Baſilic* (18), the leſſer of which the *Spaniards* call *cocolubis*. Both of them

(14) *Eugeniæ vites*, a *Greek* name, importing the nobleneſs and generouſneſs of the wine they produce. When tranſplanted, they loſe their quality, as is the caſe of many others, which leave their excellency behind them, and never carry it elſewhere. Theſe vines flouriſhed on mount *Albano*, near the antient city *Alba* in *Latium*, whither they were brought from the *Taorminan* hills in *Sicily*, as *Pliny* ſays.

(15) *Vites Allobrogicæ*. The *Allobrogians* were a people that inhabited the country that lies between the lake of *Geneva*, the *Rhone*, and the *Alps*, comprehending all *Savoy* on this ſide mount *Senis*, and a part of *Dauphiny*. *Pliny* ſays, that they throve in cold places, ripened with the froſts, and were of a black colour.

(16) *Apianæ vites*, ſo called from the liking that bees have to them; for they feed greedily upon them. Our author mentions three ſorts of them, of one of which, he ſays, *tardius recipit cariem antiquitatis*; which, I believe, is applicable not to the vine, but to the wine. By this *carioufneſs of antiquity*, the antients meant a certain agreeableneſs of taſte and flavour, which certain wines contracted by long-keeping, *Pliny*, *lib.* xv. *c.* 2. *Blanda inveterati vini caries ad ſervandum invitat*. Theſe wines were at firſt ſweet, but contracted an agreeable roughneſs by long-keeping. *Hardouin* ſays, that this grape is now called *uva tranſcatella*, becauſe the flies attack it with their darts.

(17) *Vitis Biturica*, ſo called from the country where they grow about *Bourges* in *Berry* in *France*. Father *Hardouin* thinks, that they comprehend alſo ſuch as grow about *Bourdeaux*, and in *Gaſcony*.

(18) *Baſilica vitis* ſeems to have its name from its ſtately appearance.

Our author makes two ſorts of this vine, the leſſer and the greater; and *Pliny* alſo ſays, that, in *Spain*, there are two ſorts of them; that it is thin of cluſters, and endures the violent heats, and the ſouth winds; that one ſort bears an oblong berry, the other a round

them are next to the very beſt of all; for their wine bears with long-keeping, and, by years, it arrives to ſome degree of goodneſs. Now, theſe indeed excel all the other vines I have before mentioned in fruitfulneſs, as alſo in their patience, becauſe they endure moſt courageouſly both whirlwinds and ſhowers, and flow very well; nor do they fail in lean ground. They bear the colds better than they do rains, and rains better than droughts; nevertheleſs they are not grieved and made ſad with the heats.

Next to theſe the *Viſula* and the leſſer *Argitis* (19) thrive and rejoice in land that is but indifferent; for, in that which is fat, by their too great ſtrength, they become luxuriant; and, in that which is lean, they come up ſmall, and empty of fruit. They are more friendly to the frame, than to trees. But the *Argitis* is even fertile upon high trees, and over-abounds in a vaſt quantity of firm wood, and cluſters of grapes. The *Viſula* is fitter for the loweſt ſtories of the frame. It puts forth but ſhort hard wood, and a broad leaf, by the largeneſs of which it defends its fruits exceeding well againſt the hail; which nevertheleſs fall to the ground, if they be not gathered as ſoon as they are ripe. They rot alſo with too much moiſture before they fall off.

There are alſo the *Helvolæ* (20), which ſome call various or particoloured. They are neither purple-coloured, nor black, and are ſo called (if I am not miſtaken) from their carnation-colour. That which is more of the black is preferable for the abundance of its wine; but the other, that is nearer to a purple colour, is more precious and valuable for its taſte. The colour of the berries does not appear equal to the eye neither in the one nor the other. Both of them yield more or leſs white muſt every other year by turns. They clothe a tree beſt, but a frame alſo

one; and that they gather them the laſt of all; the ſweeter the wine of the leſſer is, the better it is; that the ſweet, with age, becomes rough, and the rough becomes ſweet; that they produce fruit in great abundance; but are hurtful to the head, tho' of great benefit to the bladder. According to ſome authors, there is great plenty of this ſort of vine in the kingdom of *Granada* in *Spain*.

(19) *Viſula* and the leſſer *Argitis*. *Pliny* gives us no reaſon why *vitis Viſula* is ſo called; only ſays, that it is very humourſome and whimſical in chuſing its ſoil, can neither bear continued heat nor cold; that it rots in a fat, and does not grow at all in a lean ground; but delicately ſeeks a middle temperature, and therefore is very familiar to the *Sabinian* hills. He ſays, that its grape is *indecora viſu*, ugly to the eye, but pleaſant to the taſte. It would be ſtretching Etymology too far to ſay, it is ſo called, becauſe it is ugly to look upon. *Argitis* ſeems to be ſo called from its white colour, and probably of its wood and leaves. I do not find it under this name in *Pliny*. *Hardouin* thinks, that the leſſer *Viſula* is by *Columella* called *Argitis*; but, according to the account he gives of it, he ſeems to mean a different vine, making two ſorts of the *Argitis*, and not calling the leſſer *Viſula Argitis*, as he thinks. *Pliny* ſeems to make two ſorts of the *Viſula*, the leſſer and the greater, as *Columella* does of the *Argitis*.

(20) *Helvolæ*, ſo called from their remarkable colour, as *Pliny* alſo ſays, which is a middle between purple and black, which, in *Latin*, is called *helvus*. They are alſo called *variane*, their berries ſeeming to change their colour.

tolerably well. They are alſo fruitful in an indifferent ſoil, as the *Precian vines* (21), the leſſer and the greater; but theſe are more commended for the generouſneſs of their wine; and they ſhoot out into much wood, and abound in boughs and leaves, and they ſoon ripen.

The *Albuelis* (22) (as *Celſus* ſays) is more profitable upon a hill, than upon a plain; upon a tree, than upon a frame; upon the top of a tree, than upon the lower part of it. It both bears plenty of grapes, and abounds in firm wood. For thoſe ſmall *Greek* vines, as the *Mareotic* (23), *Thaſian* (24), *Pſythian* (25), *Sophortian* (26), tho' they have a tolerable good taſte, yet, in our climates, they yield but little wine, from the thinneſs of their cluſters, and the ſmallneſs of their berries. Nevertheleſs the black *Inerticula* (the ſluggiſh vine), which ſome *Greeks* call *Amethyſton* (27), may be placed, as it were, in the ſecond tribe, becauſe it both yields a good wine, and is harmleſs; from which alſo it took its name, becauſe it is reckoned dull, and not to have ſpirit enough to affect the nerves, tho' it is not dull and flat to the taſte.

Celſus makes a third claſs of thoſe that are commended for their fruitfulneſs only; as the three *Helvenacian* vines (28), of which the two larger

(21) *Pretiæ* or *preciæ vites*. *Columella* ſeems to inſinuate, that they are ſo called from the precioufneſs of their wines. *Pliny* ſays, that their grapes are very proper to be put up and kept in jars; and that they have abundance of hard wood, and a leaf like parſley, *i. e.* their leaves are cut very deep. *Hardouin* ſays, they are like thoſe the *Burgundians* call *raiſins fendans*. *Servius* ſays, they were called *preciæ*, *quaſi præcoquæ*, becauſe they ripen before others.

(22) *Albuelis vitis*. Neither *Pliny*, *Columella*, nor *Iſidorus*, tell us why it is ſo called; whether from its colour or place, I know not.

(23) *Mareotides*, *Mareotis*, a country in *Egypt*. There is a lake there of the ſame name. Theſe vines have their name from the place where they firſt grew, and probably were thence tranſported into *Greece*, and from *Greece* into *Italy*; which may be the reaſon why *Columella* ranks them among the ſmall *Greek* vines.

(24) *Thaſiæ vites*. Theſe vines have their name from the iſland *Thaſus*, by ſome called *Thaſſos* and *Thaſſus*. It lies in the *Ægean* ſea, not far from *Lemnos*, of old, as *Pliny* ſays, called *Aeria* or *Æthria*, now *Thaſo*.

(25) *Pſythiæ vites*. I don't find in *Pliny*, or any other author I have looked into, why they were ſo called. *Virgil* mentions them, and ſays, that their grapes were beſt for drying in the ſun, and afterwards making wine of them; which, I ſuppoſe, he means, when he ſays, *paſſo pſythia utilior*. *Servius*, and other commentators I have ſeen, skip over it. *Jenſon's* edition of *Columella* has *Pythiæ vites*.

(26) *Sophortiæ vites*. It is doubtful whether it ought to be thus read, or *Sophrotiæ*. *Pliny* ſays nothing of them under this name. There is a ſmall iſland in the *Ægean* ſea they call *Sophonia*; ſo that perhaps it ought to be *Sophoniæ vites*.

(27) *Inerticula nigra*. The *Greeks* call it ἀμέθυσον, from the little effect that its wine has to make one drunk. *Pliny* ſays, that there is more reaſon to call it the *ſober vine*; and that its wine is commendable when it is very old.

(28) *Helvenaceæ vites*. *Pliny* calls them likewiſe *Helvicas vites*, *ager Helviorum*, the *Vivarais* in *France*. The town is called *Viviers* upon the *Rhone*. *Pliny* ſpeaks of *Alba Helvia*; and *Cæſar*, in his ſeventh book, ſays, that mount *Gebenna* ſeparates the *Arverni* from the *Helvii*; ſo that the *Helvenian* vines were ſuch as were originally of the country of the *Helvii*.

larger are, by no means, eſteemed equal to the leſſer, either in the goodneſs or abundance of their muſt. One of theſe, which the inhabitants of *Gaul* call *Emarcum*, yields an indifferent wine; the other, which they call the long, as alſo the greedy vine, yields a ſordid paltry wine, and not in ſo great quantity, as from the number of its cluſters of grapes our firſt hopes promiſe us. The leaſt and beſt of the three is moſt eaſily known by its leaf; for, of all other vines whatſoever, it bears the roundeſt; and is commendable, becauſe it patiently endures droughts far beyond any others, and bears colds, provided nevertheleſs they be without rains; and becauſe, in ſome places alſo, its wine is poured into veſſels, in order to be kept for years, till it be very old; and eſpecially becauſe it alone, by its fruitfulneſs, recommends and gives reputation alſo to the leaneſt ground.

But the *Spianian* vine (29) is very bountiful and liberal of its muſt, and is rather fertile in the largeneſs, than in the number of its cluſters, as the *olive-like vine* (30), the *Murgentine* (31), which is the ſame with the *Pompeian*, the *Numiſian*; as the *Venuculan* (32), which is the ſame with the *Scirpula* and *Sticula*; the black *Fregellan* (33), the *Merican* (34), the *Rhætian* (35), and the greater *Arcelacan*, which, of all

Helvii. Our author makes three ſorts of them, one of which the inhabitants called *emarcium*, perhaps from its being apt to fade and wither. It is diſtinguiſhed by the roundneſs of its leaf.

(29) *Spionia vitis*. *Pliny* ſays, ſome call it *ſpinea*, probably from its having leaves, or ſome other things, prickly, or like to thorns, about it. He ſays, that it thrives beſt in a moiſt, rainy, and foggy country; and for this reaſon it is peculiar to the country of *Ravenna*.

(30) *Oleagimea vitis*. *Pliny* ſays, that this vine is ſo called, from the reſemblance it bears to the olive.

(31) *Murgentina vitis*, from the city *Murgentum* in *Sicily*. *Ager Murgentinus* is mentioned by *Tully*, in his oration againſt *Verres*. *Columella* ſeems to make it the ſame with the *vitis Pompeiana*, ſo called from *Pompeii*, a town in *Campania*, at the mouth of the river *Sarno*. It was once a municipal town, but now ruinous.

(32) *Vitis venucula*. Sometimes it is called *venuncula*; others read it *venicula*. It is ſo called, becauſe its berries are diſtinguiſhed and marked with veins and lines, and chanelled, as it were. It is alſo called *ſticula*, *a στίχος*, from the regular manner wherewith it is thus marked. It is by *Pliny* alſo called *ſcripula*, *ſcirtula*, and *ſcribula*, all which cannot be true readings; but the name ſeems to import, that the grains or berries have ſomething, as it were, written upon them.

(33) *Fregellanæ vites*, from *Fregellæ*, once a famous town and colony in *Latium*. Some authors ſay, it is now called *Monte Corvo*.

(34) *Vitis merica*. In *Pliny* it is with a diphthongue. In ſome manuſcripts it is *metica*. Why ſo called, is very uncertain. *Pliny* ſays, it is exceeding firm againſt rain, and all kind of weather. It bears black grapes, and its wine grows red, when it is long kept.

(35) *Rhætica vitis*, from the country where they originally grew. *Rhætia* comprehends the country of the *Griſons*, *Tyrol*, &c. They cultivated them much in the *Valteline*, and upon the river *Addua*. *Pliny* ſays, that there was a vine of this name, which grew below the *Alps*, upon the ſea-coaſts, towards *Genoa*, which produced very bad wine; that the grapes had very thin skins, and but one kernel; that they were very different from the other *Rhætian* vines firſt-mentioned.

the vines we have known, abounds moſt in grapes. By many it is falſly thought to be the *Argitis*. For thoſe others, which have lately come to my knowledge, I mean the *arbour* or *gallery-vine*, the *Irtiola* (36), and *Feriola* vines, I would not, for certain, affirm in what claſs they ought to be reckoned; becauſe, tho' I know, that they are fruitful enough, nevertheleſs I have not been able, as yet, to judge of the goodneſs of the wine they produce.

We find alſo, that there is one early-ripe vine, which, before this time, we knew nothing of, and which, in the *Greek* language, we find, is uſually called *Dracontion* (37), which, for its fruitfulneſs and deliciouſneſs, may be compared to the *Arcelacan*, *Biturican*, and *Baſilican vines*, and, for the generouſneſs of its wine, to the *Aminean*. Moreover, there are many other ſorts of vines, of which we can neither tell the number, nor the names, with any certainty to be depended upon; for, as the poet ſays (38),

'It ſerves no end their numbers to deſcribe.
'The man, that's fond of this laborious taſk,
'With equal eaſe, may learn how many ſands,
'By weſtern winds, are toſs'd in *Libyan* plains.'

Becauſe all countries whatſoever, and almoſt all particular parts of countries, have their own peculiar kinds of vines, which they name according to their own cuſtom and language. Some ſtocks alſo have changed their names with their places; ſome of them alſo, by changing their places, have departed from their peculiar quality; ſo that they cannot be known and diſcerned from one another. Therefore, in this *Italy* itſelf, not to ſay in the ſo widely extended globe of the whole earth, they vary their names. Neighbouring nations alſo diſagree in their names, and give them different appellations; wherefore it is the part of a prudent maſter not to take up the ſtudent's time with hawking after a nomenclature of this kind, which they can never make themſelves maſters of, but, upon the whole, to lay down that as a precept, which both *Celſus* ſays, and before him *Marcus Cato*, that no ſort of vine ought to be planted, but that which is approved by fame; and none to be kept

(36) *Irtiola vitis*. *Pliny* ſays, that this vine abounds in *Umbria*, and about *Ancona*; but why it is ſo called, no reaſon is given by any of the ruſtic writers, which is the caſe with reſpect to ſeveral others here mentioned; and it ſignifies nothing to indulge one's fancy, when it gives no light to the thing.

(37) *Dracontion*, probably ſo called from the twiſting and winding of its branches, and the colour and appearance of its bark, reſembling a dragon.

(38) *Virg. Georg. lib.* ii. 103.

for

for a long time, unleſs it be approved by experiment; and *Julius Græcinus* ſays, that, where many advantages of the country ſhall invite us to plant a noble vine, we will inquire and look out for one that is generous. Where there is nothing at all, or not much, that may encourage and allure us, we will rather purſue and ſearch after fruitfulneſs, which, in the ſame proportion, is not ſo much excelled by the price, as it does excel by its abundance. But, concerning this opinion, tho' I myſelf, a little before, was of the ſame mind, nevertheleſs what my ſecret judgment is, upon cloſer conſideration, I ſhall preſently tell in its proper place; for I am reſolved to teach after what manner vineyards may be conſtituted equally fruitful, and productive alſo at the ſame time of a precious liquor.

CHAP. III.

That there is nothing of greater Advantage, and more expedient for Huſbandmen, than to cultivate Vineyards.

NOW, before I come to diſcourſe of the planting of vines, I don't think it improper to lay, as a certain foundation for our future diſputation, that we have before throughly weighed, and wiſely conſidered, whether the culture of vineyards will enrich a maſter of a family; for it is almoſt to no purpoſe to give directions about planting them, while that which is the chief point, and firſt to be conſidered, is not yet granted; *viz.* whether or not we ought to have any vines at all? And this very many people are in ſo great doubt of, that many avoid it, and are much afraid of employing their land in this manner, and think, that an eſtate in meadows, paſturage, or copſes, is more to be deſired and wiſhed for; for, as to lands planted with trees for ſupporting vines, there has been alſo no ſmall diſpute among authors, *Saſerna* diſliking and rejecting this kind of land, and *Tremellius* greatly approving of the ſame. But we ſhall take this opinion alſo into conſideration in its own place.

In the mean time they, who ſtudy agriculture, muſt be taught this in the firſt place, that the income of vineyards is the moſt plentiful and abundant of any; and, that I may take no notice of the happy condition of lands in antient times, of which both *Marcus Cato* long ago, and afterwards

wards *Terentius Varro* (1), have given us an account, that each *jugerum* of vineyards did yield ſix hundred *urns* of wine (2); and *Varro* poſitively affirms this in his firſt book of Huſbandry; and that this did not uſe to happen in one region only, but was the uſual quantity, that both the *Faventine* land, and alſo that part of *Gallia Ciſalpina*, now called *Picenum*, did produce: yes, marry, theſe things were for thoſe times! But, at this preſent time, the *Nomentan* region (3) is very much celebrated by fame, and is in very great reputation, and eſpecially that part of it, which *Seneca*, a perſon of an excellent genius and learning, does poſſeſs, upon whoſe eſtate it is certainly known, that each *jugerum* of his vineyards have, for the moſt part, yielded eight *cullei* (4): for the things that happened in our *Ceretanian* vineyards (5) ſeem ſomewhat ſtrange and extraordinary, and have ſomething of a prodigy, that, in your land, a certain vine ſhould exceed the number of two thouſand cluſters of grapes; and, with me, eighty ſtocks, planted not two years before, ſhould produce ſo much as ſeven *cullei*; and that the beſt vineyards ſhould yield an hundred *amphoræ* (6) *per jugerum*, when mea-

(1) *Varro* ſays, *lib.* i. *c.* 2. that *Cato*, in his *libro originum*, gave this account of the vaſt produce of vineyards; and that this did not happen in one place only, but was common in the *Faventine* land, or the territory of *Faventia*, a town upon the *Æmilian* road, about 20 miles from *Ravenna*, now called *Faenza*; as alſo in *Picenum*, a part of *Gallia Ciſalpina*, now called *Marca d'Ancona*, and ſubject to the Pope.

(2) Six hundred urns, which make 300 *amphoræ*, or 15 *cullei*, amount in *Engliſh* wine-meaſure to 2150 gallons, or 35 hogſheads eight gallons and a ſmall fraction more. The
gall. pints. fol. inc. dec.
urn contained 3 4½ 5,33. Our author ſeems ſcarcely to believe this vaſt produce; and ſays, that it was only for thoſe antient times, and ſo paſſes to what he knew himſelf.

(3) *Nomentana regio*, the territory of *Nomentum*, a town in *Sabina*, upon the river *Anien* or *Tiverone*, about 20 miles from *Rome*. It is now a village. Here *Seneca*, the famous moral philoſopher, well known by his writings ſtill extant, had an eſtate. He was tutor to the emperor *Nero*, who, for ſome time after his acceſſion to the empire, was very fond of him, and beſtowed great riches upon him; but, as tyrants cannot long endure good men, he added this wickedneſs to his other monſtrous crimes, that he put him to death. It is probable our author wrote this book, before *Seneca* was entruſted with the education of *Nero*.

(4) *Culleus* or *culeus* was the greateſt meaſure of liquid things among the *Romans*. It con-
gall. pints. fol. inc. dec.
tained 20 *amphoræ*, or 40 urns, and, in *Engliſh* wine-meaſure, contained 143 3 11,095 ſo that 8 *cullei* make 1147 gallons, or 18 hogſheads and 13 gallons, and 7 *cullei* contained 1003 gallons 7½ pints, or 15 hogſheads 58 gallons and 7½ pints, or thereabout.

(5) *Ceretanian vineyards*. The *Ceretani* were a people of *Hiſpania Citerior*. The wine that grew in their country was in great requeſt, and mentioned by ſeveral authors. *Columella* muſt here mean either the vineyards which he had in that country, or probably vineyards which he had planted in *Italy* with vines brought from thence, to which he gave the name of the country from whence he brought the vines.

(6) *Amphora*, from the *Greek* word ἀμφιφορεὺς, or, by a ſyncope, ἀμφορεὺς. It is ſo called from its two handles for carriage. It contained 2 urns or 8 *congii*, in *Engliſh* wine-
gall. pint. fol. inc. dec.
meaſure 7 1 10.66 ſo that 100 *amphoræ* contained 717 gallons, or 11 hogſheads 24 gallons, or thereabouts.

dows,

dows, paſturages, and woods, ſeem to do mighty well for, and to turn to very good account to, the owner, if they bring him in a hundred *ſeſtertii* (7) on each *jugerum*; for we can ſcarcely remember when corns, in the greateſt part of *Italy* indeed, have anſwered with a fourth part of this.

Why then is this thing in ſo great diſreputation? *Græcinus* ſays, that it is not from its own fault, but from mens; firſt, becauſe nobody gives diligence in examining and trying the plants; and therefore moſt part of men plant vineyards of the worſt kind. Then they don't cheriſh and nouriſh them, after they are planted, in ſuch a manner, that they may grow ſtrong, and ſhoot up, before they are parched and burnt up with the heat; but if peradventure they grow up, they cultivate them negligently. Now, from the very beginning, they think, that it is of no importance what place they plant; yea, they even pick out the very worſt part of their lands, as if that ground, which can bear no other thing, were only the fitteſt for this ſtem; but they don't even ſo much as throughly underſtand the way of ſetting them, nor put it in practice when they do underſtand it: alſo they ſeldom prepare, and lay up beforehand, a portion or dowry, that is, the neceſſary furniture and implements for vineyards; whereas this thing, if neglected, exhauſts many days labour, and always empties the maſter of the family's coffers.

Moſt people indeed are mighty intent upon having as much fruit for the preſent as is poſſible, and make no proviſion for the time to come; but, as if they lived altogether from hand to mouth, and only had regard for the preſent time, they ſo force the vines, and load them with ſo many fruit-bearing branches, that they have no regard for the intereſt of their poſterity. After having been guilty of all, or at leaſt of moſt, of theſe things, they will rather do any thing than confeſs their own fault; and they complain, that the vineyards don't anſwer their expectation, which they themſelves have deſtroyed, either through covetouſneſs, ignorance, or negligence. But if there be any, who, when they have added diligence to knowledge, cannot indeed (as I reckon) receive forty or thirty, yet, as *Græcinus* ſays, who makes the loweſt computation,

(7) The *Roman ſeſtertius* was a ſilver coin, equal in value to $2\frac{1}{2}$ *aſſes*, and is ſo called from *ſemiſtertius*, *i. e.* 2 *aſſes* and the half of the third. It was equal to the fourth part of the *denarius*, as is clear from the beſt claſſical authors; which I need not mention. The *denarius*, which was the chief ſilver-coin among the *Romans*, weighed about 62 grains, and is, by the beſt judges, computed to be worth 7*d.* $\frac{1}{4}$ *Engliſh*, allowing 8 *Engliſh* grains to the ſilver-peny; ſo that, according to this valuation, 100 *ſeſtertii* amount to 16*s.* 1*d* $\frac{1}{4}$ which was the common or ordinary yearly rent of a *jugerum* of paſture, meadow, or copſe land.

if

if they ſhall receive twenty *amphoræ* (8) of each *jugerum*, they will eaſily, in the increaſe of their eſtate, ſurpaſs thoſe who hug, and are mighty fond of their hay and their pot-herbs: nor is he miſtaken in this, becauſe, as a good reaſoner, and a diligent accountant, after he had made his calculation, he ſaw, that this kind of Huſbandry conduced moſt to improve his eſtate.

For let us ſuppoſe the largeſt expences that vineyards may require, nevertheleſs ſeven *jugera* (9) don't require above the labour of one Vine-dreſſer; which the vulgar indeed value at a very low price, and think, that even a malefactor, expoſed to public ſale, may be purchaſed for that purpoſe; but I, who diſſent from the opinion of very many people, think, that an excellent Vine-dreſſer, purchaſed at an high price, is one of the firſt and principal things, and of the greateſt advantage; and, ſuppoſe he be bought for ſix, or rather for eight thouſand *ſeſtertii* (10), when I reckon that the ground itſelf, conſiſting of ſeven *jugera*, is purchaſed for juſt ſo many thouſand *ſeſtertii*, *viz.* ſeven thouſand (11); and that the vineyards, with their dowry, that is, with ſtakes or props, and willows, are planted for two thouſand *ſeſtertii per jugerum* (12); then

	gall.	pints	roods	ſq. poles	ſq. feet &c.
(8) 20 *amphoræ per jugerum* amount to	143	3½	upon 2	18	250.05 *Engliſh* meaſure.

(9) 7 *jugera* make 4½ acres.

(10) 8000 *ſeſtertii*, the price of an excellent Vine-dreſſer, make in *Engliſh* money 64 *l.* 11 *s.* 8 *d.*

(11) The price of the land proper for vineyards is computed by our author at 1000 *ſeſtertii per jugerum*, which, for the whole ſeven *jugera*, amounted to 7000 *ſeſtertii*, which, according to the value of the *ſeſtertius* before-mentioned, make in *Engliſh* money 56 *l.* 10 *s.* 2½ *d.* ſo that a *jugerum* of ſuch kind of land being worth 8 *l.* 1 *s.* 5½ *d.* an *Engliſh* acre, according to this rate, was worth about 13 *l.* 1 *s.* 1 *d.* the *Roman jugerum* being to the *Engliſh* acre near as 10 to 16. as has been often ſaid. Here it may be proper to obſerve, that *totidem millibus*, in the text, do not refer to the 8000 *ſeſtertii* paid for the Vine-dreſſer, but to the laſt-mentioned number, *ſeptem jugerum*; and ſignify the ſame thing, as if the author had ſaid, that he counted the land at 1000 *ſeſtertii per jugerum*; ſo that, there being 7 *jugera* here mentioned, his meaning by *totidem millibus* is, that he computed the land at 7000 *ſeſtertii*. This is manifeſt by adding the ſeveral ſums together, which, the text ſays, amount to 29,000 *ſeſtertii*; whereas, if theſe two words referred to the 8000 *ſeſtertii* paid for the Vine-dreſſer, they would, with the 14,000 *ſeſtertii* expended upon planting the 7 *jugera*, amount to 30,000 *ſeſtertii*. The not adverting to this has been the occaſion of a miſtake made by a very worthy and learned gentleman, in his diſſertations on antient coins, weights, meaſures, *&c. p.* 155. *chap.* viii. *Of the price of lands among the* Romans; where, from this place of *Columella*, he makes a wrong calculation of the value of a *jugerum* of land at that time among the *Romans*, and of an *Engliſh* acre of land after the ſame rate. This miſtake any perſon would eaſily fall into, who did not carefully attend to what follows after theſe two words, and omit to add the different ſums there mentioned together.

(12) 2000 *ſeſtertii*, i. e. 16 *l.* 2 *s.* 11 *d.* computed to be the expence of planting one *jugerum* of vineyard, which amount to 14,000 *ſeſtertii* for the whole 7 *jugera*; add to this ſum the price of the Vine-dreſſer, *viz.* 8000 *ſeſtertii*, and the price of the 7 *jugera* of land, *viz.* 7000 *ſeſtertii*, the whole amounts to 29,000 *ſeſtertii* principal money laid out for

then the price of all theſe, added together, amounts to twenty-nine thouſand *ſeſtertii:* add to this ſum the intereſt at ſix *per cent. per annum* for two years, when the vineyards, being, as it were, in their infancy, bear no fruit, which amounts to three thouſand four hundred and eighty *ſeſtertii*; the whole principal and intereſt amount to thirty-two thouſand four hundred and eighty *ſeſtertii*; which ſum if a Huſbandman would make his vineyards, as it were, debtors for, in the ſame manner as an uſurer does with his debtors, ſo as the owner may have the foreſaid intereſt of ſix *per cent. per annum*, he ought to receive yearly one thouſand nine hundred and fifty *ſeſtertii* (13). By which computation nevertheleſs the yearly income of the ſeven *jugera*, even according to the opinion of *Græcinus*, exceeds, or is much better than, the intereſt of thirty-two thouſand four hundred and eighty *ſeſtertii*; for, ſuppoſe the vineyards were of the very worſt ſort, yet, if they be cultivated, each *jugerum* will certainly produce a *culleus* of wine (14); and ſuppoſe the forty *urns* may be ſold for three hundred *ſeſtertii*, which is the loweſt price wine can be ſuppoſed to be ſold at, nevertheleſs the ſeven *cullei* make up the ſum of two thouſand and one hundred *ſeſtertii* (15). Moreover, this ſum exceeds the intereſt of ſix *per cent.* and this calculation, which we have made, comprehends *Græcinus*'s computation. But we are of opinion, that thoſe vineyards ought to be extirpated, which yield leſs than three *cullei* of wine the *jugerum* (16); and yet we have made our computation, ſo as if there were no quick-ſets to be taken up out of the paſtinated ground, when that very article

purchaſing and planting 7 *jugera* of vineyard. This, in *Engliſh* money, comes to 234 *l.* 2 *s.* 3½ *d.*

The intereſt of 29,000 *ſeſtertii* for two years, at ſix *per cent.* is 3480 *ſeſtertii*, which, added to the principal, make 32,480 *ſeſtertii*, or, in *Engliſh* money, about 262 *l.* 3 *s.* 6 *d.* which is the whole charge of purchaſing and planting the 7 *jugera* of land, and the two years intereſt before it is ſuppoſed to anſwer.

(13) The intereſt of 32,480 *ſeſtertii* at 6 *per cent.* is 1948⅘ *ſeſtertii*; but the text, in the copies I have ſeen, has 1950. Probably the author was willing to expreſs an even ſum, without a fraction, or elſe there is an error in the copies. This intereſt amounts, in *Engliſh* money, to about 15 *l.* 14 *s.* 10 *d.*

(14) *Singula jugera*, &c. The author ſays, that vineyards of the worſt kind, if cultivated, would produce *per jugerum* a *culleus* of wine, *i. e.* about ⅘ of an *Engliſh* acre would
gall. pints. fol. inc. dec.
produce 143 3 11.098, or 2 hogſheads 17 gallons and 3 pints, with the fraction, which, the author ſays, when ſold at the loweſt price, will bring 300 *ſeſtertii*, or 2 *l.* 8 *s.* 5¼ *d.* At this rate a gallon comes to about 4 *d.* but this is ſuppoſed to be both of the worſt vineyards, and of the worſt wine, and conſequently the loweſt price that wine could then be ſuppoſed to be ſold at.

(15) The 7 *cullei* make up the ſum of 2100 *ſeſtertii*, or 16 *l.* 19 *s.* 0¼ *d.*

(16) Three *cullei* of wine the *jugerum*, *i. e.* 430 gallons and 2 pints. Our author ſays, ſuch vineyards, which did not yield this quantity, ought to be extirpated, *i. e.* which did not yield 10 hogſheads and 20 gallons an *Engliſh* acre.

alone may, by the price it bears, free the ground of all expences whatſoever, provided it be not provincial, but *Italian* land.

Nor ought this to remain a doubt with any perſon, after he has looked into, and conſidered, both our computation and that of *Julius Atticus*; for we, at this preſent time, ſet twenty thouſand ſhoots or cuttings amongſt the rows of vines upon one *jugerum* of vineyard; he plants four thouſand leſs. But, ſuppoſe his way to be the beſt, yet there is no place, even tho' it be ever ſo bad, which will not yield a greater profit than the charges it has had beſtowed upon it. But let us ſuppoſe, that, by the careleſſneſs of the Vine-dreſſer, ſix thouſand of the plants ſhould periſh, yet the remaining ten thouſand any farmer of vineyards (17) will willingly purchaſe for three thouſand *ſeſtertii* (18), and gain by them: which ſum exceeds, by its third part, the two thouſand *ſeſtertii*, which, we ſaid before, was the charge that the planting of a *jugerum* of vineyard amounts to, altho' we, by our care, have now brought things to ſuch an improvement, that the Ruſtics purchaſe of me quickſets very chearfully at ſix hundred *ſeſtertii* a thouſand. But another perſon will ſcarcely be able to come this length; for nobody will eaſily believe, that there is ſo great abundance of wine upon our ſmall parcel of land, as you, *Silvinus*, very well know. I have therefore fixed the quickſets at an ordinary and common price, that they who, through ignorance, are afraid to meddle with this part of Huſbandry, may be brought over to my opinion, without any one perſon diſſenting from it; therefore either the advantage we ſhall make of our paſtinated ground, or the hope we have of future vintages, ought to encourage us to plant vineyards: and, ſeeing we have proved, that it is conſiſtent with reaſon to plant them, we ſhall now give precepts and directions for inſtituting them, and putting them into due order (20).

CHAP.

(17) *Redemptor.* This word is applied by authors to many different things. *Feſtus* ſays, that antiently *redemptores* were ſuch as undertook to do or furniſh any thing for the public, and, after performance, were to receive a ſum of money. Afterwards the word came to be uſed for any perſon, who hired the uſe of any thing, and was obliged to pay a certain ſum of money, or ſome other conſideration, for the ſame. In this place it muſt ſignify a farmer of a vineyard, who commonly paid the half of the fruit thereof.

(18) 10,000 vine-plants ſold for 3000 *ſeſtertii*, in *Engliſh* money 24 *l.* 4 *s.* 4½ *d.*

(19) 600 *ſeſtertii*, the price of 1000 quickſets or vine-plants, *i. e.* 4 *l.* 16 *s.* 10½ *d. Engliſh* money.

(20) At the end of this chapter it may not be amiſs to obſerve, that *Columella* makes uſe of *nummus*, *nummus ſeſtertius*, and *ſeſtertius*, as equivalent terms denoting the ſame ſum.

It may likewiſe be of ſome uſe to obſerve his manner of expreſſing the rate of the intereſt of money at the time he wrote; and, in order to underſtand his expreſſion, we muſt know, that, among the *Romans*, the higheſt legal intereſt was one *per cent.* a month, or twelve *per cent.* a year; and that it was the cuſtom to pay this one *per cent.* on the calends of every month, from which came the phraſe *triſtes calendæ*. And, as this one *per cent.*

CHAP. IV.

What Things he ought to obſerve, who plants Vineyards.

WHOEVER has the making of vineyards much at heart, let him beware, above all things, of chuſing to entruſt them rather to the care of another perſon, than to his own; nor let him purchaſe any quickſets, but let him plant at home ſhoots and cuttings of the moſt approved kind, and make a nurſery of vines, out of which he may cloath his lands with vineyards; for ſuch ſtrange plants, as are tranſplanted from a different quarter, are not ſo familiar to our ſoil, as thoſe that are natives of it, and brought up in it; therefore, as if they were of a foreign extraction, they greatly dread a change of climate and ſituation: but neither can they give us any certain evidence, that they are of the generous kind, ſeeing it is uncertain, whether he who planted them did ſet that ſort of ſhoot, which had been carefully examined, tried and approved: wherefore the ſpace of two years muſt not at all be thought long, within which time plants come ſuch a length, as duly to anſwer our expectation, ſeeing, as I ſaid, it will always turn to good account to have ſet a ſtem of an excellent kind.

Then, after theſe things, let him remember to be very exact in chuſing a place for the vineyards, which when he is come to a final reſolution about, let him know, that he muſt give the greateſt diligence to paſtinate it as it ought to be; which when he has throughly done, let

cent. was the hundredth part of the principal, it was therefore called *centeſima uſura*; and tho' it was not contrary to law to take ſo great intereſt, yet it was, for the moſt part, accounted oppreſſion: ſo that it was common enough to take ſix or eight *per cent.* more or leſs, according as the borrower had credit, and could find a reaſonable lender. However, the *uſura centeſima* was the integer, which authors had in view, when they mentioned the *quantum* of intereſt. It is alſo further neceſſary to know, that, in order to expreſs any integer, they made uſe of the name of a braſs coin they called *as*, which conſiſted of twelve ounces or diviſions, each of which had a different appellation; ſo, to expreſs any part of the integer, they gave it the name of that part or diviſion of the *as*, which correſponded to it. Thus, to expreſs the whole *centeſima uſura*, they ſaid *aſſes uſuræ*; and to expreſs a part, they ſaid *triens uſuræ*, *quadrans uſuræ*, &c. through all the diviſions of it. Thus *Columella*, in this chapter, to expreſs $\frac{1}{2}$ *per cent.* a month, and ſix *per cent.* a year, calls it *ſemiſſis uſurarum*. And, that this is his meaning, we may eaſily ſee, by calculating the ſeveral ſums mentioned in the text; ſo, according to this analogy, he would have ſaid *trientis uſurarum* to expreſs four *per cent.* a year, and $\frac{1}{3}$ *per cent.* a month; *quadrans uſurarum*, three *per cent. per annum*, and $\frac{1}{4}$ *per cent.* a month; *dodrans uſurarum*, nine *per cent.* a year, and $\frac{1}{4}$ *per cent.* a month; and ſo of all the reſt of the diviſions of the *as*, correſponding to the *centeſima uſura*. Some authors indeed have expreſſed this matter differently; but they muſt mean the ſame thing.

him, with no leſs care, plant the vine; and, after he has planted it, let him apply himſelf to the culture of it with the greateſt ſedulity; for this is the chief and principal point, as it were, in all expences, becauſe it conſiſts in this, whether a maſter of a family has acted better or worſe in committing his money to the earth, than if he ſhould finger it in idleneſs, and not employ it at all. Therefore I ſhall now proſecute, in their order, each of theſe things I have propoſed.

CHAP. V.

In what ſort of Ground, and after what manner, a Nurſery of Vines muſt be made.

A Nurſery of vines muſt not be made either in hungry ground, nor in that which is ouſy; nevertheleſs the land muſt be juicy, and rather middling than fat, altho' all authors almoſt have deſtinated the richeſt and fruitfulleſt place for this purpoſe, which I don't at all think is for the Huſbandman's advantage; for the ſtems being ſet in a ſtrong ground, tho' they quickly ſtrike root, and ſhoot up, yet, when they are become quickſets, if they be tranſplanted into a worſe ſoil, they ſhrink and wither, and cannot grow up to their full ſtature; for it is the part of a prudent Huſbandman to tranſplant rather from a worſe to a better, than from a better to a worſe ſoil: for which reaſon, in the choice of a place, *mediocrity* is moſt approved, becauſe it is placed in the confines of, or in the middle between, good and bad; for whether neceſſity ſhall afterwards require us to commit theſe plants, when they are fit to be removed, to a hungry ſoil, they will not feel any great difference when they are tranſplanted from indifferent ground to that which is poor; or whether it be a richer land, which is to be planted therewith, they will improve and grow up much faſter with plenty and abundance of *nouriſhment*.

Moreover, it is not at all for our intereſt, or agreeable to reaſon, to make a nurſery of vines in a very thin poor ſoil, becauſe the greater part of the ſhoots or cuttings periſhes, and what remains becomes ſlowly fit for tranſplanting: therefore a middling and moderately dry land is fitteſt for a nurſery of vines; and it ought firſt to be broken up and ſubdued with the double-hoe or trenching-ſpade, which is the depth of the paſti-

nation,

nation, when the ground is turned up to two feet and an half (1). Then having left ſpaces of three feet, by which the plants may be cultivated, you muſt plant ſix hundred ſhoots or cuttings in each row, conſiſting of two hundred and forty feet. This number makes up all together twenty-four thouſand plants upon the whole *jugerum*. But the careful examination and choice of the ſhoots or cuttings precedes this care; for, as I have now often told you, it is the foundation, as it were, of the foreſaid affair, to ſet the moſt approved kind of them.

CHAP. VI.

What Sort of Shoot or Cutting muſt be choſen, and from what Parts of the Vine it muſt be gathered.

BUT the choice muſt be made with a twofold regard; for it is not enough, that the mother, from which the plants are ſought, be fruitful; but greater ſubtilty of reaſon muſt be uſed, that they may be taken from thoſe parts of her body, which are both genital, and the moſt fertil: for a vine, whoſe offſpring we are deſirous to ſet apart for bearing fruit, ought not to be eſteemed for this reaſon only, becauſe it produces very many cluſters of grapes; for this may happen from the vaſtneſs of its trunk, and the great number of its fruit-bearing branches (1): nevertheleſs I would not call that a fertile vine, where ſingle cluſters are ſeen upon each ſpray or twig, but if, upon every young twig of the preſent year, a greater number of bunches hangs down; if, from each eye upon its very many firm branches, it germinates with fruit; if, laſtly, it puts forth from its hard part alſo a twig with ſome cluſters upon it; if alſo it is pregnant with the fruit of the nephews,

(1) *Bipalium*, a tool they made uſe of for trenching ground. *Pliny* calls it *bidens ternos pedes bipalio alto*, which muſt ſignify, that the iron part of it was 3 feet deep. Father *Hardouin* ſays, that *bipalium* was the iron part of the *bidens*, wherewith the earth was digged. *Columella*, I reckon, means a *bipalium* of 2 feet, or 2½. The firſt was called *bipalium non altum*; the ſecond *bipalium altum*, which may ſignify a trenching-ſpade or mattock 2 or 2½ feet deep.

(1) *Palmites* are the young branches or ſprays of vines, which ſhoot forth from the vine, like fingers from the hand; and, as has been already ſaid, they are called *palmites*, from their reſembling the human hand. There are two ſorts of them, one which grows out of the firm hard wood of the vine, and, for the moſt part, bears only leaves the firſt year, and is called *pampinarius*; the other is that which ſprings out of a branch of one year old, and, becauſe it preſently brings forth fruit, is called *fructuarius*.

or

or ſecondary ſhoots (2). This vine, without doubt, being fruitful, ought to be deſtinated for ſhoots to be gathered from it.

But a *malleolus* (3) or *mallet-ſhoot* is a young vine-branch or tendril growing out of a rod of the former year, taking its ſurname from its likeneſs to the thing by which it is called, becauſe, in that part which is cut off from the old branch, it is prominent on each ſide, and has the appearance of, or reſembles a mallet. We are of opinion, that this ſhould be gathered from the fruitfulleſt ſtem every time the vineyards are pruned, and be carefully covered over with earth in a place moderately moiſt, but not ouſy, leaving three or four eyes ſtanding out above-ground; provided nevertheleſs, that this be always a principal point with us, to examine and take due care, that the vine, from which it is taken, be not liable to uncertainty, with reſpect to the event of its bloſſom; that its berry does not with difficulty grow big; that it neither brings early ripe fruit, nor that which is too late in coming to maturity; for the former is infeſted by the fowls of the air, and the latter by ſtormy weather.

Moreover, we cannot have any certain proof of ſuch a kind of vine by one vintage; for even a vine that is naturally unfruitful may, for

(2) *Nepotes* are twigs or ſmall ſprays growing out of a ſpray or twig of the ſame year. I call them ſecondary ſhoots. *Columella*, *lib.* iv. *cap.* 24. ſays, *ipſos palmites quos vindemiæ præparamus, claviculis ac nepotibus privandos cenſeo*; he ordered the fruit-bearing branches, which were prepared for the vintage, to be bereaved of their tendrils and nephews, or ſecondary ſhoots, and *quicquid a tenero proceſſit ſicut nepos parcius detondetur*; ſo that *nepos* ſignifies a twig, that grows out of a twig of the ſame year, which, with reſpect to the branch of which it is the iſſue, is, as it were, the grandchild; for there is in the vine what our author calls *durum*, *i. e.* the firm hard wood, become ſo by time; and there is the *tenerum*, which is a twig or young branch, which is, as yet, but ſoft and ſpongy, and has not had time to harden; ſo that, I think, the learned father *Hardouin* miſtakes *Pliny*, *lib.* xvii. *cap.* 21. when he ſays, that *nepotes* are *virgæ quas vitis ciet e radicibus aut caudicis lateribus*, rods which the vine putteth forth out of her roots, and the ſides of her trunk; for theſe, I think, are always called *ſtolones*.

(3) *Malleolus*. Our writers upon gardening, I ſee, retain this word, as they do many other original words, both *Greek* and *Latin*, which may be neceſſary perhaps in the names of trees, plants, *&c.* where their own language furniſhes them no words; but, when this is carried too far, very few people can read their books with that pleaſure, which otherwiſe they would have; ſo that it is to be wiſhed, that theſe ingenious gentlemen would ſometimes make uſe of circumlocutions in expreſſing things, that ſo more people might profit by their learned writings. It would be eaſy to draw up a catalogue of words, which they uſe, which frighten *Engliſh* readers, who underſtand neither *Greek* nor *Latin*. The ingenious Mr. *Millar* has indeed, in a great meaſure, remedied this inconveniency in his moſt uſeful dictionary, by an alphabetical catalogue of thoſe hard words, with their explanations, which, in time, may make them as familiar to the reader, as other *Engliſh* words; and the learned Dr. *Martin* has followed the ſame method in his firſt lecture of his courſe of botany.

I have tranſlated *malleolus* a mallet-ſhoot or cutting, as our author explains it. It is a cutting taken off the branch, with a bit of the old wood on each ſide of it, which makes it reſemble a mallet; but cuttings, which were not of this form, and had nothing of the old wood adhering to them, notwithſtanding ſtill retained the old name.

once,

once, bring forth abundantly, either from the great plenty of the year, or from ſome other cauſes; but, when a vine has once eſtabliſhed its reputation, ſo as to be depended upon by the merit, as it were, of the ſervice of a great many years, there is no further doubt to be made of its fruitfulneſs. Nevertheleſs ſuch an inquiry is not to be extended above the term of four years; for that time commonly, wherein the ſun returns to the ſame part of the Zodiac through the ſame numbers by which it began its courſe, diſcovers the generous qualities of all green things whatſoever; which periodical courſe of one thouſand four hundred and ſixty-one whole days they, who apply themſelves to the ſtudy of celeſtial things, call ἀποκατάστασιν, or the reſtitution of things to their former ſtate (4).

CHAP. VII.

How you may know and diſcover the Fruitfulneſs of a Vine.

BUT I am perſuaded, *Publius Silvinus*, that you are long ago tacitly inquiring what kind this fruitful vine, which we ſo accurately deſcribe, may be of, and whether or not one of thoſe, which are not commonly eſteemed the moſt fertile, is not pointed at; for very many people extol and praiſe the *Bituric*; many the *Spionian*; ſome the *Baſilis*; and ſome the *Arcelacan* or *arbour-vine*. We alſo do not unjuſtly deprive theſe ſorts of vines of our commendation; for they yield a vaſt quantity of wine: but we have reſolved to teach you to plant ſuch vineyards, as may bring no leſs plenty of fruit, than thoſe ſorts already mentioned, and of as precious a taſte as that of the *Aminean*, or, at leaſt, not far from that taſte.

I know, that almoſt all Huſbandmen differ from us in their opinion upon this point, which, with reſpect to *Aminean* vines, is become inveterate, and now has prevailed a long time, as if they laboured under a

(4) Ἀποκατάστασις ſignifies the reſtitution of any thing into its former ſtate or form. *Columella*, no doubt, means, by this word, the *Julian* year of 365 days and ſix hours, four times repeated, which make 1461 days. This word is alſo applied to the annual revolution or return of a heavenly body to the ſame ſign; as for example, from *Aries* through the 12 ſigns to *Aries* again. It is alſo made uſe of to ſignify what they call the *Dionyſian period*, which is, by multiplying the cycle of the ſun of 28 years with the cycle of the moon of 19, which produces 532 years; which being finiſhed, it was believed, that the new-moons and full-moons returned to the ſame day of the year, and of the week; and this was called *converſio anni magni*. But what influence the revolution of four years can have upon trees, plants, and other green things, our author does not explain.

natural

natural and innate ſterility; for which reaſon, it is more neceſſary, that the method, which we have recalled, and brought back from long diſuſe and neglect, and which, being condemned by the ſlothfulneſs, and no leſs by the imprudence of Huſbandmen, and, as it were, kept in obſcurity by the darkneſs of ignorance, has not been fairly repreſented, nor ſet in a true light, ſhould be ſupported and eſtabliſhed by very many examples: wherefore it is not improper to turn our thoughts firſt towards thoſe things, which ſeem proper to correct this public error.

CHAP. VIII.

What Quality you are principally to have regard to, in Ground that you deſtinate for Vineyards.

THEREFORE, *Publius Silvinus*, if, with the eyes of our mind, as it were, we would more intently contemplate *Nature*, the former of all things, we ſhould find, that ſhe has eſtabliſhed the like law of fecundity for every green thing, as for men, and other living creatures; and that ſhe has not beſtowed peculiar gifts and advantages upon ſome nations and countries, ſo as wholly to deny the like endowments to others. To ſome nations ſhe has given the advantage of propagating a numerous offſpring, as to the *Egyptians* and *Africans*, with whom it is a very common and ordinary thing almoſt every year to have two children at a birth; and of *Italian* extraction alſo, ſhe has been pleaſed to endow with exceeding great fruitfulneſs ſome *Albanian* ladies of the *Curiatian* family (1), who were mothers of three children at a birth. She has graced *Germany* with armies of exceeding tall men; but has not wholly deprived other nations of men of excellent ſtature; for both *Marcus Tullius Cicero* is a witneſs, that *Nævius Pollio* (2), a *Roman* citizen, was a foot taller than the talleſt man whatſoever, and lately we ourſelves might have ſeen, in the apparatus for the pompous celebration of the *Circenſian* games, a man of the *Jewiſh* nation, who was taller than the talleſt *German*.

(1) *Albanas Curiatiæ familiæ*. *Dionyſius Halicarnaſſeus* gives an account of two daughters of an *Albanian* gentleman being married, one into the family of the *Curiatii* of *Albano*, the other into the family of the *Horatii* at *Rome*; and that they both had three children at one birth. The *Egyptians*, *Pliny* ſays, are alſo thus fruitful, which he attributes to their drinking of the water of the *Nile*, which he calls *fetifer Nilus*; of which *Solinus* ſays, *cap.* 1. that it not only makes the land fruitful, but alſo the woman's womb.

(2) *Nævius Pollio*. *Tully* wrote a book *de admirandis*, which *Pliny* mentions in his thirty-firſt book of *natural hiſtory*. It is probable he mentioned this giant in that book.

I paſs

I paſs now to cattle: *Mevania* (3) is famous and remarkable for herds of tall cattle, and *Liguria* (4) for ſmall; but, in *Mevania*, ſometimes there is ſeen a low ox, and in *Liguria* a bull of an eminent ſtature. *India* is reported to be wonderful for the vaſt bulk of its wild beaſts; nevertheleſs who will deny, that, in this land, there are bred terrible beaſts of equal hugeneſs? ſince we may obſerve, that there are elephants brought forth within our walls.

I return to the fruits of the earth of ſeveral kinds: they ſay, that *Myſia* (5) and *Libya* abound in large crops of corn; nor are the lands of *Apulia* and *Campania* (6) inferior to them in plentiful crops; that *Tmolus* (7) and *Corycus* (8) are reckoned famous for the ſaffron-flower, and *Judæa* and *Arabia* for their precious odours. But neither is our city deſtitute of the foreſaid ſtems, foraſmuch as we ſee at one time caſſia putting forth its leaves, and thriving in many parts of the town; at another time the frankincenſe-plant, and the gardens bloſſoming with myrrh and ſaffron. Certainly, by theſe examples, we are given to underſtand, that *Italy* is moſt obſequious to the induſtry of mortals, it having learned to bear whatever grows in any other part almoſt of the whole earth, when Huſbandmen have applied due diligence and care: for which reaſon we are in leſs doubt about that fruit, which, being, as it were, originally a native of the country, is natural, familiar, and peculiarly adapted to this ſoil; for there is no doubt, but the vines of the *Maſſican*, *Surrentinian*, *Albanian*, and *Cæcuban* lands are, for the nobleneſs of their wine, the chief and the moſt excellent of all thoſe that the earth ſuſtains.

(3) *Mevania*, now called *Bevagna*, a city in *Umbria* in *Italy*. It was the country of *Propertius* the poet, who celebrates the *tauriferi campi Mevaniæ*.

(4) *Liguria* comprehended all that country now called *La Riviera di Genoa*, which extends a great many miles upon that part of the *Mediterranean* ſea called *Mare Liguſticum*. It comprehended alſo a great part of *Gallia Ciſalpina*, between the *Apennines* to the ſouth and eaſt, the *Cottian Alps* to the weſt, and the river *Po* to the north, comprehending *Montferrat*, a great part of *Piedmont*, and a part of the duchy of *Milan*.

(5) *Myſia*, a country of the *Leſſer Aſia*, now called *Natolia*, ſubject to the *Turks*.

(6) *Campania*, a moſt beautiful and fruitful country in the kingdom of *Naples*, now called *Terra di Lavoro*.

Apulia, now called *Puglia*, a province in the kingdom of *Naples*.

(7) *Tmolus*, a mountain in *Phrygia* in *Leſſer Aſia*, upon the confines of *Lydia*, famous for ſaffron, of which both *Virgil* and *Ovid* make mention.

(8) *Corycus*, a city of *Cilicia*, by ſome called *Corcur* and *Curcho*; as alſo a mountain in that country famous for ſaffron. Some ſay, that the ſaffron has its name from the mountain; others from the city. It is much celebrated by *Dioſcorides*, *Galen*, *Pliny*, and others.

CHAP. IX.

How you may make Aminean *Vines fruitful.*

IN theſe perhaps *fruitfulneſs* is wanting; but this may be promoted by the induſtry of him that cultivates them: for if, as I ſaid a little before, *Nature*, the moſt bountiful parent of all things, has enriched every particular nation and country with peculiar gifts, yet ſo as not wholly to deprive others of the like endowments, why ſhould we doubt, that ſhe has obſerved the foreſaid law alſo in vines? That altho' ſhe has thought fit, that ſome kind of them ſhould be particularly fruitful above all others, as the *Bituric* and the *Baſilic*, yet ſhe has not made the *Aminean* kind ſo barren, that, of many thouſands of them, there ſhould not be found a very few fruitful ones, as theſe *Albanian* ſiſters among the *Italian* ladies.

But as this is very likely, ſo alſo experience has taught us, that it is true; foraſmuch as in the *Ardeatine* land (1), which we ourſelves have had in our poſſeſſion for theſe many years, as alſo in the *Carſeolian* (2) and *Albanian* lands, we have had *Aminean* vines of this character; very few indeed, but ſo fertile, that, upon a frame, each of them yielded three urns (3); and, in arbours, they amounted to ten *amphoræ* of wine each (4). Nor ought this fruitfulneſs in *Aminean* vines to ſeem incredible; for how could *Terentius Varro*, and, before his time, *Marcus Cato*, affirm, that each *jugerum* of vineyards yielded to the antient Huſbandmen ſix hundred urns of wine, if *Aminean* vines were deficient in fruitfulneſs, they being, for the moſt part, the only vines, which the antients were acquainted with? unleſs we think, that the vines which they cultivated were of the *Bituric* or *Baſilic* kind, which, being lately brought from very diſtant countries, are juſt now come to our knowledge; whereas, at this preſent time, we reckon the *Aminean* vineyards to be the moſt antient.

(1) *Ardea*, formerly a famous town of *Latium*, between *Oſtia* and *Antium*, now intirely ruinous. It was more antient than *Rome*, and the metropolis of the *Rutili*.

(2) *Carſeoli* and *Carſeola*, a colony and town in *Latium*, near to the *Lacus Fucinus* in the Pope's dominions. It was antiently a town of the *Æqui*, now called *Arſoli*.

(3) Three urns, *i. e.* 10 gallons 6 pints.

(4) Ten *amphoræ*, *i. e.* 71 gallons 3 pints. This ſeems to be too great a quantity; for it is not probable, that a vine's growing in the form of an arbour, and its branches expanded, and extended to a great length, ſhould make it ſo much more fruitful than that which grows upon the *jugum* or frame; ſo that it is probable, as the learned *Geſnerus* ſays, that there is an error in the text; and that it was, at firſt, *ſenas* or *binas*, and not *denas*, as we have it now. Errors, in numbers, eaſily creep into books.

If

If any man therefore would, for ſeveral vintages, obſerve and mark ſuch *Aminean* vines, as I told you I had in my poſſeſſion a little while ago, that, from them, he might chuſe the moſt fertil cuttings, he might raiſe vineyards equally generous and abundant in fruit; for there is no manner of doubt, but it was the will and pleaſure of Nature itſelf, that the offspring ſhould be like to the mother. Hence it is, that the ſhepherd alſo, in the *bucolics*, ſays (5),

'I've known the puppy, and the wanton kid,
'Each like its dam grow up.'

And hence it is, that they, who are fond of contending for the maſtery in the ſacred games, keep, with great diligence and care, the breed of the ſwifteſt horſes, and conceive hopes of future victories from the offſpring, which has been propagated of a generous ſtud. Let us alſo, for the like reaſon as they in chuſing the breed of the *Olympian* mares, found all our hopes of future vintages in chuſing the ſeeds of the moſt fruitful *Aminean* vines.

Nor is there any reaſon, that the tedioufneſs of the time ſhould deter any perſon; for, whatever delay there is, it is taken up in examining and making a trial of the ſhoot or cyon. But, when once the fruitfulneſs of the vine has been ſufficiently proved, it is very quickly raiſed to a very great number by engraftments. Of this thing, you, *Publius Silvinus*, can give evidence for us, ſeeing you will very well remember, that I completely finiſhed the planting of two *jugera* of vineyard in leſs than two years time, by making engraftments from one early ripe vine belonging to you in your *Ceretanian* eſtate. What number of vines therefore do you think might be planted within the like ſpace of time from the cuttings and ſhoots of two *jugera*, when theſe two *jugera* themſelves are the offspring of one vine?

Wherefore, if, as I ſaid, we would beſtow labour and care, we ſhall eaſily, by the foreſaid method, form as fruitful vineyards of the *Aminean*, as of the *Bituric* and *Baſilic* kinds: only it will be of great importance, that, in tranſplanting the plants, we obſerve and keep the like ſtate and conſtitution of the climate, and alſo the quality, ſituation, and diſpoſition of the place, and of the vine itſelf; becauſe, for the moſt part, a cutting or cyon degenerates, if either the ſituation, or the quality of the land, or of the air, be repugnant to it; or alſo, if it be brought from a tree, and put upon a frame.

(5) *Virg. ecl.* i. 23.

Therefore we muſt tranſplant from cold to cold, from hot to the like ſtate, and from vineyards into vineyards. Nevertheleſs an *Aminean* ſtem, when removed from a cold ſtate, can better bear that which is hot, than from a warm ſituation, that which is cold; becauſe every kind of vine, but eſpecially that before-mentioned, is naturally more delighted with warmth, than with cold.

But the quality of the ſoil alſo helps very much, that it be removed from that which is lean or indifferent, to that which is better; for that which has been accuſtomed to a fat ſoil can by no means endure a lean ground, unleſs you dung it often: and theſe are the precepts we have given you in general concerning the care that is to be taken in the choice of mallet-ſhoots or cuttings. Now we come to give you particular directions, that they may be choſen, not only from the fruitfulleſt vine, but alſo from that part of the vine, which bears the greateſt plenty of fruit.

CHAP. X.

From what Part of the Vine the Plants muſt be choſen.

BUT the moſt fertil plants are not, as antient authors have taught us, the extreme part of it, which they call the head of the vine, that is, the utmoſt, and the moſt produced or longeſt rod of it; for in this alſo Huſbandmen are deceived: but the cauſe of this error is the firſt beautiful appearance and number of the cluſters, which, for the moſt part, is ſeen upon the longeſt and moſt produced branch; which thing ought not to deceive us, for it happens not from the natural, innate fertility of the fruit-bearing branch, but from the conveniency and advantage of the place, becauſe all the moiſture and nouriſhment, which the ground diſpenſes, paſſes quickly through the other parts of the trunk, till it comes to the laſt; for the whole nouriſhment of any green thing, as if it were a certain ſoul, is, by its natural ſpirit, drawn to the top, through the marrow of the trunk, as through a ſiphon, which mechanics call a *diabetes* (1); to which place when it is come, it ſtops there, and is conſumed: and hence it is, that, either in the head

(1) *Diabetes* is a *Greek* word, which comes from a *Greek* verb, which ſignifies to *paſs through*. It is an incurvated inſtrument, or crooked glaſs tube, for drawing liquor out of a veſſel, and is ſo called from the liquor paſſing quickly through it. In alluſion to this, that diſeaſe of the body, wherein whatever one drinks does ſuddenly flow through the veſſels, and paſs by urine, is called by this name; becauſe the moiſture of the body does not ſtop any-where, but paſſes from place to place, juſt as water does through a ſiphon.

of

of the vine, or in the ſhank, next to the roots, are found the firm wood-branches, that ſhoot forth the moſt vehemently; but thoſe ſhoots, which are produced out of the hard part of the vine, are approved by them for two reaſons, becauſe they are without any offspring, or are empty of fruit, and alſo becauſe they are nouriſhed by the freſh, pure, and unmixed juice next to the earth; and thoſe others are reckoned fertil and firm, becauſe they creep forth out of the tender part of the vine, and whatever nouriſhment, as I ſaid above, comes to them, is not divided, and diſperſed to other parts. The ſhoots that ſprout out of the middle of the vine are the leaneſt, becauſe the moiſture paſſes quickly by them, and is partly intercepted on this ſide of them, and drawn from them on the other: therefore neither the uppermoſt or higheſt rod, nor the loweſt, ought to be reckoned fruitful, altho' it may bring forth much fruit; foraſmuch as it is forced to bear much fruit, by the exceeding fruitfulneſs of the place it grows upon: but that branch ought to be reckoned fruitful, which, being ſituated in the middle of the vine, even tho' it be in an inconvenient place, yet does not fail to bear, but ſhews its benignity by a numerous offspring. When this branch is tranſplanted, it very rarely degenerates, when, from a worſe ſtate and condition, it paſſes to, and obtains a better; for whether it be ſet in paſtinated ground, or grafted upon a ſtock, it is ſatiated with more plentiful nouriſhment than formerly, when it was in a poor and needy ſtate.

Therefore we will carefully obſerve to chuſe and gather our plants from the fore-mentioned places, which Ruſtics call the *ſhoulder-parts* of the vine, nevertheleſs ſuch as we ſhall have obſerved to have brought forth ſome fruit before; for, if they be intirely deſtitute of fruit, we are of opinion, that the moſt commendable part of the vine will contribute nothing to the fruitfulneſs of the cutting.

Wherefore the opinion of thoſe Huſbandmen is exceeding erroneous, who believe, that it is of very little moment and importance what number of cluſters a ſpray may have, provided it be gathered from a fruitful vine, and is not ſprung out of the hard ſtock, which they call a *ſtock-branch*. But this opinion, which has its riſe from their ignorance, or their not knowing the plants that ought to be choſen, does firſt make ſuch vineyards as are but indifferently fruitful, and afterwards alſo ſuch as are too barren: for who is it now, that, in ſo long a courſe of years, has ever given the Huſbandman, when he was gathering his cuttings, ſuch precepts as I have mentioned a little before? yea, who is it, that does not pick out for this buſineſs the moſt imprudent ſervant he has, and one that is not able to do any other thing? Therefore, from this

cuſtom,

cuſtom, ſuch as are the moſt unſkilful and imprudent, and the moſt infirm alſo, come to undertake a buſineſs the moſt neceſſary of any; for, as I ſaid before, every fellow that is the moſt uſeleſs, and who cannot endure any other labour, is put to this buſineſs. Morever, this perſon alſo, if he has any knowledge or ſkill to chuſe the cuttings, yet, becauſe of his infirmities, either diſſembles or conceals it, or lays it aſide, and does not make uſe of it; and, that he may complete the number, which the Bailiff has injoined him, manages nothing with due care, does nothing conſcientiouſly: and there is only one thing that he has in view, and propoſes to himſelf; *viz.* to finiſh the taſk that has been ſet him, when, notwithſtanding that he may both know, and alſo execute what he knows, this one precept only has he received from his maſters, *viz.* that he take care not to pull off and diſplant the ſtock-ſhoot; but all the reſt he may throw into his number of plants.

But we, having at firſt followed reaſon as our guide, and now alſo a long time's experience, make choice of no other plant, nor look upon any as fruitful, but that which has brought forth fruit in the genital part of the vine; for that indeed which has come forth in a thriving condition, and is grown up, and become ſtrong, in a barren place, without any fruit, makes a deceitful ſhew and appearance of fruitfulneſs, but poſſeſſes no generative power. Reaſon teaches us, that this is undoubtedly true, if ſo be that, as in our bodies every member has its peculiar offices, ſo all the parts of fruit-bearing ſtems have their proper offices alſo. We ſee, that men have a ſoul breathed into them, which, like a Charioteer or a Pilot, conducts and directs their members; and they have ſenſes implanted in them, in order to diſcern thoſe things, which are diſcernable and found out by feeling, by the taſte, by the noſtrils, by the ears, and by the eyes; that the feet are adapted for walking, the arms for embracing: and, that our diſcourſe may not, in an unuſual manner, wander over all the various viciſſitudes and changes of miniſtrations our ſenſes are employed in, the ears are able to do nothing which properly belongs to the eyes; nor the eyes what belongs to the ears: nor indeed is the power of procreation beſtowed upon the hands or the feet; but the *Father of the univerſe* has covered and hid in the belly, that which it was his will and pleaſure ſhould be unknown to men, that the *eternal Former of all things*, who is endued with divine reaſon, might, as it were, in certain ſecret receſſes of the body, hiddenly and in ſecret, mingle thoſe ſacred elements of ſpirit with terreſtrial principles, and curiouſly make and faſhion this ſpecies of a living and animated machine. By this law he procreated cattle, young trees, and ſprigs; by this

this law he formed and faſhioned the ſeveral kinds of vines, for which this ſelf-ſame mother and parent did firſt lay their roots, as certain foundations upon which they might ſtand, as it were, upon feet: then, upon theſe, he placed the trunk, as a certain ſtature and ſize of body and habit: afterwards he diffuſed them, or made them to ſpread with branches, as it were with arms; and then he drew forth their ſhoots and twigs, as it were hands: and upon ſome of them he beſtowed fruit, and others he cloathed with leaves only, to protect and defend their offspring. If from theſe therefore, as I have already ſaid, we ſhall chuſe not the very genital members themſelves, which are pregnant and great with young, but, as it were, their coverings, and little ſhadows for ſheltering them, which are intirely deſtitute of fruit, we ſhall certainly labour for a ſhadow, and not for a vintage.

What is it therefore that we would be at, *may you ſay?* Why is a young branch or ſhoot, tho' ſprung, not out of the hard, but out of the tender part of the vine, condemned nevertheleſs by us, if it be deſtitute of offspring, as if it would be barren alſo in time to come? for juſt now our reaſoning inferred, that every part of the body had its peculiar office aſſigned to it; *viz.* that which is ſuitable and agreeable to it; ſo that the power of fecundity may be inherent in a ſhoot alſo, which is ſprung out of an opportune place, tho' in the mean time it may ceaſe from producing any fruit. I would not deny, that I warmly inſiſted to argue from this very thing; but this I chiefly inſiſt upon, and maintain, that a branch, tho' it be ſprung out of the fruit-bearing part of the vine, has by no means the power of fecundity, if it has not itſelf already brought forth fruit. Nor is this contrary to that opinion; for it is manifeſt, that there are ſome men, who cannot procreate, tho' the number of all their members be complete and perfect; ſo that it need not ſeem incredible, if a rod, which, growing in a genital place, wants fruit, will alſo produce no offspring in time to come.

Therefore, that I may return to the uſual way of ſpeaking among Huſbandmen, thoſe ſhoots or twigs, which produce nothing at all, they call *Eunuchs*; which they would not do, unleſs they ſuſpected them incapable of producing fruit: which very appellation itſelf ſuggeſted a reaſon to me for not chuſing mallet-ſhoots or cuttings, tho' ſprung out of an approved or commendable part of the vine, if they had not produced any fruit, altho' I know, that even theſe are not intirely affected with barrenneſs; for I confeſs, that ſtock-ſhoots alſo, tho' they have crept forth out of the hard part of the vine, acquire fecundity during the following year; and therefore they are reſerved and ſet apart for

ſhort

ſhort cuts (2), that they may bring forth fruit. But we find, that this kind of fruit is not owing ſo much to the ſhort cut itſelf, as to the bounty of the mother-vine; for, becauſe it ſticks to and abides in its own ſtock, which is naturally fertile, and partaking as yet of the maternal nouriſhment, in conjunction with the other fruitful plants, which ſhe has brought forth, and being brought up, and nouriſhed, as it were, at its nurſe's breaſts, it learns, by little and little with them, to bring forth fruit. But that plant, which is forcibly ſnatched from its ſtock before its due time, and while under-age, not having attained to that maturity which nature has determined, and is either ſet in the ground, or ingrafted into a ſtock cut for that purpoſe, juſt like puerile age, which is indeed neither fit for coition nor conception, it either loſes intirely its generative power, or certainly diminiſhes and leſſens it.

Wherefore I judge it abſolutely neceſſary, that, in chuſing of plants, we take care to gather, from the fruitfulleſt part of the vine, thoſe fruit-bearing ſhoots, which, by bearing plenty of fruit already, promiſe fecundity for the time to come: nor let us content ourſelves with ſingle cluſters, but let us approve thoſe moſt, which, we ſee, have the moſt numerous offspring. Shall we not commend that ſhepherd, who propagates an offspring from that mother, which brought forth twins? and a goat-herd, who preſerves and ſets apart for breeding the young of thoſe cattle, which are commended for bringing three at a birth? for it is certainly true, that the offspring will almoſt conſtantly anſwer to the fecundity of their parents. And let us follow this very method in vines, ſo much the rather, becauſe we may find by experience, that plants or ſeeds, tho' carefully tried and approved, yet ſometimes, from a certain natural malignity, degenerate; and this the poet inculcates upon us, as if we were deaf to the truth, by ſaying,

'(3) I've ſeen ſome plants, in chuſing which, much time
'And labour were beſtow'd, which ne'ertheleſs
'Did ſoon degenerate, unleſs, with care,
'Man's ſkilful hand did yearly cull the beſt:
'Thus all things quickly, by a fatal doom,
'Decay, and, backward forc'd, to ruin tend.'

(2) *Reſex*, from *reſecare*, to pare or cut, is a young branch or ſhoot ſprung out of the hard part of the vine, cut off very ſhort, and near to the hard wood, with one or two eyes left upon it, in order to ſhoot up and recruit the vine. I have called it a *ſhort cut*, which expreſſes the thing, tho' not a term of art perhaps.

(3) *Virg. georg. lib.* i. 192.

Which

Which muſt be underſtood to be ſaid, not only of the ſeeds of all ſorts of pulſe, but of every thing that is the ſubject of agriculture.

If now we have found, by long obſervation, as certainly we have, that that cutting or mallet-ſhoot, which had brought forth four cluſters, did ſo degenerate when it was cut off from the vine, and ſet in the earth, that ſometimes it brought one, and ſometimes alſo two cluſters leſs than before: but how much do we think thoſe will come ſhort, which, upon the mother-vine, have brought two, or oftener one cluſter, when even thoſe, which are the moſt fertile, often dread tranſplantation? Therefore I willingly confeſs, that I rather demonſtrate the reaſonableneſs of this method, than pretend that I am the inventor of it, leſt any body ſhould think, that our anceſtors are unjuſtly deprived of their deſerved praiſe; for there is no doubt but they were of this very opinion, altho' we have no account of it in any other writing, except theſe verſes of *Virgil*, which we have quoted: and yet here there may be only directions given relating to the ſeeds of pulſe; for why did they reject either the rod, which ſprung out of the hard part of the vine, or the ſmall end or arrow-part (4) cut off from the fruitful mallet-ſhoot, which they had approved, if they looked upon it as a matter of no moment or importance, from what place the plants were gathered? Now, becauſe they did not doubt, but the power of fecundity was inherent in ſome particular members, as it were, therefore they very wiſely condemned the ſhoot that ſprings out of the ſtock, and the ſmall end, or arrow-part of a ſhoot, as uſeleſs, and unfit to be ſet in the ground. But, if it be ſo, there is not the leaſt doubt but they alſo diſapproved much more of that young branch, which, tho' ſprung out of a fruit-bearing part, had not itſelf brought forth any fruit; for, if they were of opinion, that the arrow, that is to ſay, the uppermoſt part of a cutting or mallet-ſhoot ought to be found fault with and rejected, when the ſame was a part of a fruit-bearing ſhoot, does not reaſon itſelf declare, how much more they would have diſapproved of a rod, if it were barren, tho' it ſprung out of the beſt part of the vine? unleſs they did believe, (which is abſurd) that that which had been naught when growing upon the mother, would become fruitful when it was tranſplanted, and cut off from its ſtock, and deprived of the maternal nouriſhment. Perhaps more has been ſaid upon theſe things, than the

(4) *Sagitta*. The pointed, or ſharp taper end, or uppermoſt part of a ſhoot, by our author, *Pliny*, and others, is called the *Arrow*; the reaſon of which, our author ſays, is either becauſe it has, as it were, mounted, or ſprung up, or ſtarted out further from its mother; or, becauſe, being ſmall, and pointed at the top, it has the reſemblance of the forelaid weapon. *Vide lib.* 4. *cap.* 17.

cauſe of truth required, yet not ſo much as the perverſely miſtaken and inveterate opinion of Ruſtics made neceſſary.

CHAP. XI.

What Qualities you muſt have Regard to in that Ground, which you deſtinate for Vineyards.

NOW I return to what remains of the plan I laid down for my diſcourſe. The buſineſs of paſtinating the ground follows the care of chuſing the cuttings, if nevertheleſs you are firſt fully ſatisfied as to the quality of the ſoil; for there is no doubt, but this contributes very much both to the goodneſs and the quantity of the fruit. And, before we take this into conſideration, we think, that it is a thing, which has been long agreed upon, and admits of no diſpute, that that land, which has never been tilled, if we have any ſuch, ought rather to be choſen, than that where there has been corn, or where trees have been planted; for, as to old vineyards, which have lain long waſte and out of uſe, it is agreed by all authors, that they are the worſt of any, if we would replant them, becauſe both the lower ground is embaraſſed and intangled with roots, which are wrought into it like net-work, and has not as yet loſt that poiſon, and that carioufneſs of antiquity or old-age, whereby the earth being blunted and weakened, as it were with certain poiſons, grows faint and benumbed. For which reaſon, woodland ought chiefly to be choſen, which, tho' it be embaraſſed with nurſeries, or plots of ſhrubs, and with trees, yet is eaſily cleared; becauſe whatever things grow up naturally of their own accord, do not ſtrike their roots exactly downwards, nor yet very deep in the earth; but they ſpread and extend themſelves upon its ſurface, which being cut with an ax, and extirpated, the little that remains in the lower ground, may be digged out with ſpades or mattocks, and gathered together, and built up in piles, in order to ferment and rot.

If, nevertheleſs, you have no rough untilled land, the next to it is ploughed land, void of trees: but if this alſo be wanting, they deſtinate for Vineyards land that has trees planted very thin upon it; or land where olive-trees have been planted, which have never been matched with Vines.

The laſt ſhift of all is, the repairing and reſtoring of an old worn-out decay'd Vineyard; for, if neceſſity forces us to do this, whatever remainders

remainders of a Vine there may be in it, ought to be rooted out in the firſt place: then all the ground ought to be dunged with dry dung; or, if this is not to be had, with the freſheſt of another kind; and ſo to be turned up, and all the roots moſt carefully dug up, and laid upon the ſurface, and burnt. Then the paſtinated ground muſt be covered, either with plenty of old dung, becauſe it does not breed weeds, or with earth brought from the briar-hedges and thickets. But where the pure lay-lands, which have never been tilled, are free from trees; before we paſtinate the ground, we muſt conſider, whether it be proper for ſhoots and cuttings: and this is very eaſily known, by the ſtems that come up of their own accord: nor is there any ground ſo long deſtitute of numbers of young ſprigs, as not to produce ſome ſhoots or cuttings, ſuch as wild pear-trees and plum-trees, or at leaſt bramble-buſhes; for, though theſe are kinds of thorns, nevertheleſs they are wont to riſe up ſtrong, and in a thriving condition, and pregnant and full of fruit. Therefore, if we don't ſee, that they are ſhrivelled and parched, nor rough and ſcabby; but ſmooth, ſleek, and fair, tall and fruitful; then we ſhall underſtand, that the ground is naturally proper for cuttings, or young ſhoots.

But this, in general, with reſpect to that ſoil which is chiefly proper for Vineyards: but, as I told you before, we muſt particularly conſider, if the ground is eaſy, and tolerably looſe, which we ſaid was commonly called *Black Earth*; not becauſe this is the only ground for Vineyards, but becauſe it is the fitteſt of any other for that purpoſe: for, what Huſbandman, of tolerable capacity, does not know, that even the hardeſt ſand-or gravel-ſtone, or black ſlate, as ſoon as they are broken and thrown into a heap upon the ſurface of the ground, will rot, open, and grow ſoft by ſtormy weather, or froſt, and likewiſe by the ſummer-heats; and that, during the ſummer, they refreſh and cool the roots of the Vines exceedingly, and retain their juice? Which things are exceeding proper for nouriſhing the cutting, or young plant: and that, for the very ſame reaſon, looſe gravel, and land that is full of ſmall pebbles, and moveable ſtones, is approved; provided, nevertheleſs, theſe things be mixed with fat mould; for the ſame are very much diſapproved in that which is poor and hungry.

The flint-ſtone alſo (according to my opinion) upon which a moderate quantity of earth is placed, is very friendly to Vineyards; becauſe, being cold, and very retentive of moiſture, it does not ſuffer the roots to be thirſty, during the riſing of the Dog-ſtar. *Hyginus*, indeed, who followed *Tremellius*, aſſerts, that the bottoms of mountains, eſpecially ſuch as receive the earth which is waſhed down from their tops; or even valleys and lands which have been formed, or have had conſider-

able additions made to them, by the continual current, or inundations of rivers, are very proper for Vineyards; and I do not diſſent from him. Chalky ground is reckoned very good for a Vine; for chalk by itſelf, which potters make uſe of, and which ſome call *Potters Earth*, or white Clay, is exceeding unfriendly to it: hungry coarſe ſand is no leſs hurtful to it; and, as *Julius Atticus* ſays, whatever parches and dries up the cutting or ſprig; but that ſoil is either ouſy, or ſalt, or bitter alſo, or thirſty and exceeding dry.

Nevertheleſs, the antients approved of black and reddiſh ſhining ſand; which is mixed with moiſt earth: for they ſaid, that land which is full of black ſlates, unleſs you aſſiſted it with dung, makes the Vines poor and lean. Ruddle alſo, as the ſame *Atticus* ſays, is very hurtful to them, and is very unfavourable to the roots, which have difficulty to take hold of it. But the ſame nouriſhes the Vine, when it has once taken hold of it; but it is more difficult when you work it, becauſe you cannot dig it either when it is wet, becauſe it is exceeding glutinous; nor when it is exceeding dry, becauſe it is ſtiff and hard beyond all meaſure.

CHAP. XII.

Of ſuch things as Julius Græcinus *delivered to us, concerning Land proper for Vineyards.*

BUT that we may not now wander over the ſeveral ſorts of land, which are infinite, it will not be unſeaſonable to mention, and put you in mind of, that written *Formula*, as it were, of *Julius Græcinus*; to which is annexed the definition or deſcription of land proper for Vineyards. For thus ſaith this ſame *Græcinus*, That any land whatſoever is either hot or cold, moiſt or dry, thin and rare, or denſe; light, or heavy; fat, or lean: but that a Vine can neither endure a hot ſoil, becauſe it burns it up; nor a very cold one, becauſe it does not ſuffer the aſtonied roots, as it were, benumbed and frozen with the exceſſive cold, to move and extend themſelves; nor can it endure that which is moiſt, becauſe when the Vines diſcloſe and ſhew themſelves, they, by a moderate heat, attract from the earth a greater quantity of moiſture than is proper for them, which putrefies and rots the plants that are ſet in it. On the other hand, *he ſays*, that too great drineſs deprives the plants of their natural nouriſhment, and either kills them intirely, or makes them ſcabby, and parches and burns them up: that very thick

thick and denſe ground does not ſip up the rains, that the wind cannot eaſily blow through it; and that it is very eaſily broken through, and affords chinks, by which the ſun penetrates to the roots of the ſtems; and that the ſame alſo compreſſes and ſtrangles the plants, which are, as it were, ſtraightened and ſhut up within too narrow bounds; that that which is rare or thin gives paſſage to the ſhowers, beyond all meaſure, which paſs into it as through a tunnel; and that it is intirely dried up and withered with the ſun and wind: that heavy earth can ſcarcely be ſubdued and brought under by any culture; and that that which is light can ſcarcely be kept in heart by any: that the fatteſt and richeſt ground labours under a very great diſadvantage from its luxuriancy; and that which is lean and poor, is diſtreſſed with hunger and faſting.

There is need, ſays he, of great temperament among ſo very different inequalities, which is alſo very requiſite in our own bodies, the good health of which conſiſts in a certain ſteady regular adjuſtment, by weight and meaſure, as it were, of hot and cold, moiſt and dry, thick and thin. Nevertheleſs, ſays he, this temperament in the ground deſtinated for Vineyards ought not to be weighed in a perfectly even balance; but it ought to lean ſomewhat toward the one ſide, that ſo the earth may be rather hotter than colder, drier than moiſter, thinner than thicker; and if there be any other things like to theſe, to which he who plants Vineyards may turn his contemplations. All which things are of greater advantage, when the conſtitution of the climate alſo concurs with them. And what quarter of the heavens Vineyards ought to look to, is a very old diſpute, *Saſerna* approving moſt of the riſing of the ſun, next to that the ſouth, and then the weſt; *Tremellius Scrofa* being of opinion, that a ſoutherly poſition is the beſt of any; *Virgil* expreſly rejecting the weſt thus:

(1) 'Nor let thy Vineyards bend towards the ſun,
'When ſetting.'

Democritus and *Mago* commending the northern quarter of the heaven, becauſe they think that Vineyards expoſed to it become the moſt fruitful, which nevertheleſs may be inferior to others in the goodneſs of their wine. It ſeems beſt to us to give directions in general, that, in cold places, Vineyards be expoſed to the ſouth quarter; and, in warm, that they be turned to the eaſt; provided nevertheleſs, that they be not infeſted with the ſouth and eaſt winds, as the maritime coaſts of *Bætica*

(1) *Virg. Georg. lib.* 2. 298.

are

are. But, if the countries be liable to the foreſaid winds, it will be better to expoſe them to the north or weſt winds. For, in exceeding hot provinces, as in *Egypt* and *Numidia*, it will be better to expoſe them directly to the north. Having carefully examined and conſidered all theſe things, we ſhall then, at length, undertake the buſineſs of paſtinating the ground.

CHAP. XIII.

After what manner the Earth ought to be paſtinated.

BUT the method of doing this muſt be delivered and deſcribed both to future Huſbandmen of *Italian* extraction, and alſo to thoſe who are born in the Provinces; becauſe, in very diſtant and remote countries, this way of turning up, manuring, and ſubduing the earth, is not at all practiſed; but, for the moſt part, vines are planted, either in trenches, or in furrows. Vines are placed in trenches in this manner: they whoſe cuſtom it is to ſet their vines in trenches, after they have digged out the earth, and made a hollow for almoſt three feet in length, and two in depth, as much as the breadth of the iron tool allows, lay the cuttings flat on each ſide, along the ſides of the trenches; and, having bended them, they raiſe them up at the oppoſite ends of the trenches; and, allowing them to appear with two eyes above the ground, they replace the earth, and make all level: this they continue to do in the ſame line, leaving intervals or baulks of the ſame number of feet, till they finiſh the row: then leaving a ſpace, according as every one is accuſtomed to cultivate his vineyard, either with the plough, or with the ſpade or mattock, they advance and carry on another row. And if the earth is only turned up by a digger, the leaſt diſtance between each row is five feet, and ſeven the greateſt; but if they turn it up with oxen and the plough, the leaſt diſtance is ſeven feet, and ten is large enough.

Nevertheleſs, ſome diſpoſe and ſet every vine at the diſtance of ten feet, in the form of a *Quincunx* (1), that ſo they may till the ground with tranſverſe and adverſe furrows, in the manner of lay land, or fallow

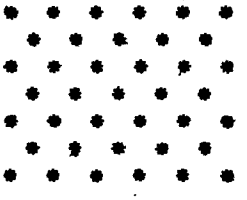
(1) *In Quincuncem.* Trees were ſaid to be planted in form of the *Quincunx*, when they were ſo placed, as to repreſent the figure uſed among the *Romans* for the number five, *viz.* V. This diſpoſition of trees, in a triangular manner, was in great eſteem among the *Romans*,

low ground. This kind of vineyard is not for the advantage of the Husbandman, unleſs where, in very rich ground, the vine riſes up to a great height, and is of a large growth. But they who dread the expences of paſtinating the ground, and yet ſtudy in ſome meaſure to imitate Paſtination, and make trenches, omitting equal ſpaces by turns, draw ſtraight furrows, of the breadth of ſix feet, and dig them, and make trenches three feet deep, and ſo place the vine or the cutting in due order, by the ſides of the trenches.

Some, with more covetouſneſs, make a furrow two feet and nine digits deep, and five feet broad; then they leave thrice as much ground unmoved, and ſo dig the following furrow; which when they have done throughout the whole place deſigned for the vineyards, in the ſides of the furrows they erect quickſets, or young vine-branches, cut off from the vine, as freſh as poſſibly they can, planting at the ſame time, among the regular plants, that compoſe the row, very many cuttings, which, after they ſhall have taken root, and are grown ſtrong, they may propagate in tranſverſe trenches in the crude ground, which they before paſſed over without moving it, and ſo regularly form their vineyards into rows at equal diſtances from one another. But theſe different ways of planting vineyards muſt either be admitted or rejected, according to the nature and goodneſs of every country.

Now I propoſe to deſcribe and teach you the method of Paſtinating or Trenching the land. And firſt of all, out of every place we ſhall have deſtinated for vineyards, whether it be planted with trees for ſupporting the vines, or be woodland, every ſhrub and tree muſt be rooted up, and taken out of the way, that they may be no hindrance after-

mans, and much recommended by their ruſtic writers. It is well enough repreſented by the poſition of the cinque upon a die, and are placed in the following manner:



As there is frequent mention, in this and the following chapters, of the *Roman foot*, it may be neceſſary to tell the reader, that it is computed by Dr. *Arbuthnot* to amount only Inch. Dec.
to 11,604; or, which is the ſame thing, the *Roman* foot, compared with the *Engliſh* foot by Mr. *Greaves*, is reckoned to contain 967 of ſuch parts as the *Engliſh* foot contains 1000; which is to be underſtood of that on the monument of *Coſſutius* in *Rome*, which, for very good reaſons, is, by theſe learned gentlemen, reckoned to be the true, antient, *Roman* foot.

wards

wards to the digger, and that the ground that is already paſtinated may not be preſſed down by the weights that lie upon it, and be trodden down by the going in of thoſe who carry out the trunks and branches of the trees. Nor is it, indeed, of ſmall importance, that the paſtinated ground be kept very looſe and ſuſpended, and, if it can be done, preſerved from the print of a foot upon it; that ſo the ground, being equally moved, may gently yield, and give way, to the roots of the young plant, whatever part they ſhall creep and extend themſelves to; and that it may not by its hardneſs reverberate, and oppoſe their growth, but receive them, as it were, into its tender and nurſing boſom, and give admittance to the celeſtial ſhowers, and diſpenſe them for nouriſhing the plants, and conſpire with all its parts to educate the new offspring.

A champain even place muſt be digged two feet and a half deep, and a riſing ground three; but a hill ſomewhat ſteeper muſt be turned up at leaſt four feet; becauſe when the ground is drawn down from an higher part to a lower, there is ſcarcely ſuch a quantity of earth thrown up to be of ſuch a depth as is neceſſary in Paſtination, unleſs you raiſe the bank much higher than you would do upon a plain. Moreover, I am not pleaſed with planting a vine in low valleys leſs than two feet deep; for it is better not to plant it, than to ſuſpend it upon the ſurface of the ground; except, nevertheleſs, when a ſpring, which forms a marſh, comes in your way (as in the land about *Ravenna*), and hinders you from digging deeper than a foot and a half.

But you muſt at firſt begin the foreſaid work, not, as moſt part of Huſbandmen do, at this preſent time, by deepening the furrow by little and little, and ſo by a ſecond and third gradation, to come at length to the depth you deſigned the paſtinated ground ſhould be of; but at the very firſt, having placed your line equally, you muſt carry on a continued trench, without any break or interruption, with its ſides exactly perpendicular, and place the earth you have moved, in due order behind your back, and carry it down ſo far, till it exactly anſwer to the meaſure of the depth given: then the line muſt be equally moved throughout the whole ſpace of the gradation: and you muſt ſo order matters, that it be made of the ſame breadth at the bottom, as it was begun at the top.

But there is need of a ſkilful and vigilant overſeer of the work, who may command the bank to be raiſed, and the furrow to be emptied, and the whole ſpace of crude ground, that is not yet moved, to be thrown up, and joined with that which is already thrown out of the trench, as I directed in the preceding book, when I deſcribed the way of tilling the ground, by giving this caution, that no baulks ſhould be omitted,

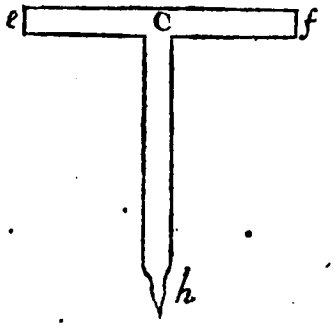
omitted, or left any-where, nor any hard part of the ground covered or hid with the uppermoſt clods thrown upon it.

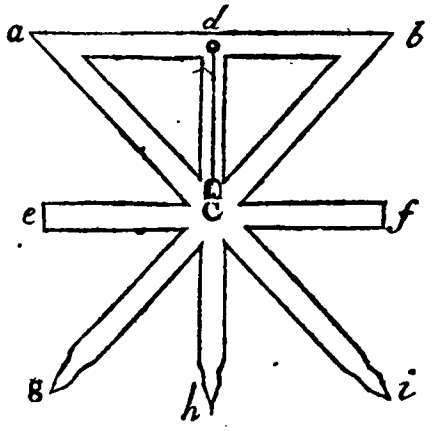
But, in order to exact the doing of this work as it ought to be done, our anceſtors deviſed a certain machine, as it were; they contrived and formed a rule or ſquare, or ſtrait piece of wood, from the middle of which a ſmall rod jutted out, commenſurate to that depth to which it was neceſſary the furrow ſhould be depreſſed, reaching from the bottom to the uppermoſt part of the bank. This kind of meaſure ruſtics call *Ciconia* (a Stork) (2): But this alſo is liable to fraud, becauſe there is a great difference which way you place it, whether inclining, or perpendicular. We have therefore added ſome parts to this machine, which may be effectual to put an end to all ſtrife and diſpute between contending parties. For we have joined together, croſſwiſe, in the form of the *Greek* letter X, two rules, of ſuch a width as the trencher deſigns to make his furrows; and ſo have faſtened that antient *Ciconia* to the middle part where the rules are joined, that ſo, being made, and fixed exactly perpendicular, it might reſt upon it, as upon a baſe, to ſupport it. Then upon the ſmall rod, which is in the middle of the tranſverſe rule, we have planted a carpenter's plummet. The inſtrument thus framed, when put down into the trench, puts an end to all diſpute between the maſter and the undertaker of the work, without injury to either party. For the ſtar, which we ſaid reſembled the *Greek* letter, does at the ſame time meaſure the ground of the bottom of the trench, and likewiſe exactly try its level; becauſe, whether it ſlopes, or whether it is exactly upon a level, it is found out by the poſition of this machine: for the plummet that is placed upon the fore-mentioned ſmall rod, ſhews both the one and the other, and does not ſuffer the overſeer of the work to be deceived. The work being thus exactly meaſured, and reduced to a level, proceeds always, and is carried on in ſuch a manner, as to bring it to the ſimilitude of ground that is fallowed: and as much ſpace is taken up by the line formed by the earth which is thrown out of the trench, as the ſaid trench, out of which it is dug, has

(2) *Ciconia*, an inſtrument contrived for meaſuring the depth and width of the trenches, when they trenched the ground. They called it by this name, probably, becauſe one part of it repreſented the bill of a ſtork. They called a certain machine, wherewith they drew water, by this name alſo, tho' ſometimes authors call it *tollenonem*. It is thus deſcribed by *Vegetius de re militari, lib.* 4. 21. *Trabes in terram prealte defixa, cui in ſummo vertice alia tranſverſa trabes longior, dimenſa medietate connectitur, i. e.* a piece of timber faſtened deep in the ground, upon the top of which another tranſverſe piece, longer than it, is joined with it, and exactly poiſed in the middle. It is called a Swipe *Iſidorus* ſays, that this machine was called *Ciconia*, becauſe it imitates a ſtork raiſing and falling her bill when ſhe crunks.

has length and breadth; and this way and method of preparing the ground is moſt approved.

crunks. The figure of this machine for meaſuring the trenches, as it was made at firſt, and alſo with the improvement made by *Columella*, you have here below. There is in ſome old editions an imperfect delineation of it; but whether originally by the author, is uncertain: but he deſcribes it ſo exactly, that one cannot miſtake it.





e f h, the antient *Circuls*.
e f, the tranſverſe rule.
c h, the ſmall rod joined to it.

a i, and *b g*, the two rules decuſſated, or joined together in the form of the *Greek* letter X.

g i, the breadth of the furrow.

c g,
c h,
f i, } the depth of the ſame.

c, the middle part, where the two rules are joined and fixed to each other.

d c, the carpenter's plummet.

g h i, the rays of the ſtar, which equally meaſure the bottom of the trench.

CHAP.

CHAP. XIV.

How many ways a Vine may be planted, either in Italy, *or in the Provinces.*

NOW follows the buſineſs of planting the vine, which is ſeaſonably ſet in the ground, either in the ſpring, or in autumn; better in the ſpring, if the conſtitution of the climate be either rainy or cold, or the land either fat, or a champain and ouſy plain: on the other hand, it is beſt to plant it in autumn, if the quality of the air be dry, or hot; if it be a poor and dry plain; or if it be a lean and ſteep hill. There are almoſt forty days proper for planting in the ſpring, from the 13th of *February* till the Equinox; and in autumn, from the 15th of *October*, to the firſt of *December*.

But there are two different ways of planting, either with the cutting, or with the quickſet, both which are in uſe with Huſbandmen; and, in the provinces, they rather make uſe of the cutting; for they neither care for, nor apply themſelves to make nurſeries; nor are they acquainted with the way of making quickſets. This way of planting with cuttings, the moſt part of the vine-dreſſers in *Italy* have, with very good reaſon, diſapproved and rejected; becauſe the quickſet is far preferable to it, and excels it in many qualities. For it is leſs liable to periſh, inaſmuch as by reaſon of its firmneſs and ſoundneſs it more eaſily ſupports both heat and cold, and other ſorts of weather; and then it grows up, and comes to perfection ſooner; from which it comes to paſs, that it is more quickly in a condition to bring forth fruit; as alſo, there is no doubt but, being often tranſplanted * (1), nevertheleſs, in looſe and yielding eaſy ground, a cutting can be immediately planted in the room of a quickſet. But that which is thick, cloſe, and heavy, does certainly require a vine.

* (1) There is a blank here in all the old editions: there ſeems only to be one or two words wanting, to ſhew the benefit a quickſet receives, by being tranſplanted; but, without the aſſiſtance of ſome manuſcript, I cannot ſee how they can be ſupplied.

CHAP. XV.

That it is better to plant in paſtinated Ground, than in Trenches or Furrows made in fallow Ground, or in that which is newly broken up.

A Vine, therefore, is planted with greateſt advantage in paſtinated ground, that has been well cleanſed, harrowed, and levelled, omitting five feet between the rows, in ground that is lean; but ſix feet in that which is middling: but in that which is fat, there muſt be ſpaces of ſeven feet allowed, that ſo larger intervals may be vacant, all along which the frequent and prolix firm boughs may be diffuſed.

This diſpoſition and laying out the dimenſions of vineyards in the form of the *Quincunx* is performed in a moſt expeditious manner: for you ſtitch to a line a bit of purple cloth, or any other conſpicuous colour, at the diſtance of ſo many feet, as you deſign the rows of the vines ſhould be diſtant from one another; which line, marked after this manner, you ſtretch along the paſtinated ground, and hard by each bit of purple cloth you faſten a reed in the ground, and ſo the rows are directed and laid out at equal diſtances from one another. And, after this is done, the digger follows, and, leaving ſpaces by turns all along the row, from one reed to another, digs a trench, no leſs than two feet and a half deep, in ſuch places as are level and plain; in riſing ground, two feet and three fourths of a foot; but, in ſuch places as are very ſteep, even three feet. The trenches being depreſſed to this depth, the quickſets are ſet into them in ſuch a manner, that every one of them may be laid flat the contrary way to one another from the middle of the trench, and their tops erected juſt by the reeds at the oppoſite ends of the trench.

But the firſt thing incumbent upon the planter to do is, to remove his plant carefully out of the nurſery, both ſound and intire, and tranſplant it as freſh as poſſible, and, if it can be done, the very moment when he has a mind to plant it; and then to prune it all over as a veteran vine, and reduce it to one very ſtrong firm-wood branch, and ſmooth its knots and ſcars; and alſo, if any of its roots have received any injury, (which he ought, above all things, carefully to avoid, when he takes them out of the ground) to cut them off; and then, bending it, to ſet it in ſuch a manner, as the roots of two vines may not interweave with one another. For this may be eaſily avoided by regularly placing a few

few ſtones all along the bottom, hard by the different ſides of the trenches, which may not exceed five pounds weight each: theſe, as *Mago* informs us, keep off the waters in winter, and the heats in ſummer, from the roots of the vines. *Virgil* is of the ſame mind with him, and directs us thus to defend and fortify the young plants:

'(1) The ſpungy pumice-ſtone, and rugged ſhells,
'Hide with them under ground.'

And, a little after:

'——— Now ſome there are,
'Who preſs them down with ſtones, or with the weight
'Of bulky ſhells; theſe, from th' o'erflowing rains,
'A ſure defence, and, from the ſcorching heat,
'When flaming Dog-ſtar cleaves the parched ground,
'Which, ſpent with thirſt, gapes for refreſhing rain.'

And the ſame *Carthaginian* author proves, that the huſks of grapes and grape-ſtones, mixed with dung, put into the trench with the plants, quicken and ſtrengthen them; and that they call forth, and draw out, their new little roots; and that this, during the cold and moiſt winter, communicates a ſeaſonable warmth to the trenches, and, in ſummer, miniſters nouriſhment and moiſture to the green plants. But, if the ground, to which you have committed the vine, appears to be poor, he is of opinion, that fat mould ſhould be brought from a greater diſtance, and put into the trenches. Whether this be expedient, or not, the increaſe or yearly produce of the country, the price that the fruits of it yield, and the wages of labourers, will teach us.

(1) *Virg. Georg. lib.* ii. 333.

CHAP.

CHAP. XVI.

What Meaſure or Quantity of paſtinated Ground may be ſufficient for Vineyards (1).

THE paſtinated ground is proper for planting, when it is a little moiſt; nevertheleſs, it is better to commit the plant to it when it is dry, than when it is miry and dirty; and, when the plant is ſo long as to ſtand ſeveral joints above the brim or uppermoſt part of the trench, that part of the top, which riſes above the trench, is cut off, only two eyes of it being left above-ground, and the trench filled up, by throwing the earth into it. Then, after the paſtinated ground is levelled, the cutting muſt be planted among the vines that grow in the rows; and it will be ſufficient to ſet it all along one line, in the middle ſpace which is vacant between the vines. For thus both the ſhoot itſelf will grow and gather ſtrength the better, and there will be left a moderate ſpace of free and open ground for dreſſing the regular plants as they ſtand in their ſeveral rows. Then, in the ſame line wherein the quickſet ſhall occupy and ſtand in its own rank, ſome cuttings alſo muſt be planted, as preſidiaries for the regular vines, out of whoſe number one may be propagated and brought into the place of a vine that is dead. Five cuttings muſt be ſet upon the ſpace of one foot (2), and

(1) This paragraph is not ſo clear and diſtinct as moſt others, and great attention is requiſite in reading the original, where ſome words ſeem to be wanting, to make the ſenſe complete. The author ſays, that the paſtinated ground being laid out into ſeveral rows, the quickſets muſt be planted upon the ſaid rows, at ſuch and ſuch diſtances from each other. The vines, being thus ſet in their ſeveral rows, are called *Vites ordinariæ*: between the ſeveral rows of regular vines, he directs a certain number of cuttings to be planted, exactly in the middle between the rows; and ſays, that even in the ſame line wherein the quickſets are planted, and occupy their own rank, muſt ſome cuttings be ſet as preſidiaries to the regular vines, *i. e.* when the regular vines periſh, theſe may be commodiouſly brought to ſupply their places; this is what is meant by *præſidii cauſa*; and in other places, they are called *malleoli præſidiarii*. *Lib.* iv. *c.* 15.

(2) *Quinq; malleoli pangendi ſunt per ſpatium pedis, iſq; pes*, &c. The author, contrary to his uſual method, ſeems in theſe words to have expreſſed his meaning very conciſely, leaving it to the reader to find it out from what he had ſaid before. In the preceding chapter he had ſaid, that in middling land there muſt be ſix feet between the rows. Now, in a *jugerum* of ground there are 240 feet in length, and 120 in breadth: ſo there will be 40 intervals lengthwiſe, and 20 in the breadth; which, multiplied into one another, make 800 intervals, or vacant ſpaces. To each interval allow five feet to plant cuttings upon, and half a foot diſtance from each vine, there will be twenty-five cuttings in every interval; which, multiplied by 800, make 20000; and this is the number of cuttings *Columella* directs to plant on each *jugerum* of paſtinated ground.

this foot is taken from the very middle of the ſpace between the rows, that they may be equally diſtant from the vines on both ſides. *Julius Atticus* thinks, that ſixteen thouſand cuttings are abundantly ſufficient for this kind of planting. Nevertheleſs, we plant more by four thouſand; becauſe a great part of them periſhes thro' the negligence of the vine-dreſſers; and the reſt, that thrive, grow thin by the death of the regular plants, whoſe places they are taken to ſupply.

CHAP. XVII.

After what Manner, and at what Time, a Vine is to be planted.

THERE has been no very ſmall diſpute among authors about the planting of ſhoots. Some were of opinion, that the whole rod, as it was pulled off from the mother, was proper for planting; and, having divided it into parts of five, or even ſix eyes each, they committed the ſeveral cuttings to the earth: which I don't at all approve; and I rather agree with thoſe authors, who denied, that the upper firm-wood branch is fit for bearing fruit, and only approveed of that part which is joined with the old ſpray. But they intirely rejected the arrow. Ruſtics call the utmoſt or laſt part of the ſhoot, *the Arrow*, either becauſe it has removed itſelf, and departed to a greater diſtance from its mother, and has, as it were, ſtarted or leapt out from her; or becauſe, being attenuated and pointed at the top, it bears the reſemblance of the foreſaid weapon. Therefore the wiſeſt Huſbandmen have denied, that that part ſhould be planted. Nevertheleſs, they have not given us any reaſon of their opinion, which they, who had great underſtanding in Huſbandry, could have readily done, it being almoſt obvious and manifeſt before their eyes. For every fruitful branch of a vine is exuberant, or abounds moſt in fruit, below the fifth or ſixth eye; and in the remaining part, tho' exceeding long, it either bears no fruit at all, or ſhews us ſome very ſmall cluſters. For which reaſon, the top of the ſhoot was, by the antients, very juſtly blamed for its barrenneſs: and they ſo planted the mallet-ſhoot, that ſome part of the old branch did ſtick to the young one. But experience has condemned the planting of it in this manner. For, whatever part of the old wood was left, did quickly rot with the moiſture, after it was ſet and covered with earth, and, by its own diſtemper killed the tender roots that were next to it, and ſcarcely as yet creeping out; and, when this happened, the upper part

of

of the plant dried up and decayed: afterwards *Julius Atticus*, and *Cornelius Celſus*, the moſt celebrated authors of our age, following the example and directions of the *Saſerna*'s, father and ſon, did cut off whatever remained of the old branch exactly by the joint where the young ſhoot grows out of it, and ſo ſet into the ground the ſpray with its own ſmall head.

CHAP. XVIII.

What things one ought to obſerve, who plants a Vine.

BUT *Julius Atticus* ſet the foreſaid plant in the earth, with its head twiſted and bended, that it might not fly off from the dibble. Huſbandmen call the forked iron tool wherewith they ſet their plants *Paſtinum* (a Dibble); and hence it was, that old vineyards, which were digged a ſecond time, were ſaid to be *repaſtinated*. For this was the proper appellation of a vineyard, that was reſtored or trenched, and replanted a ſecond time (1). Now, cuſtom, unacquainted with antiquity, calls all ground whatſoever, that is moved and prepared for vineyards, *Repaſtinated*. But let us return to what we propoſed.

Julius Atticus's way of planting, which allows of twiſting and writhing the head of the ſhoot, is, in my opinion, intirely wrong; and there are more reaſons than one for avoiding this practice: firſt, becauſe there is no ſtem whatſoever, which, being vexed and broken before it is planted, comes up and thrives better, than that which is ſet in the ground ſound and intire, without ſuffering any injury. Moreover, whatever thing is put into the earth crooked, bended, and looking upwards, when at a proper ſeaſon it is taken out of the ground, it reſiſts the efforts of the digger, as if it were a hook; and, like a crook faſtened in the ground, breaks, before it can be pulled out. For the wood is brittle in that part which contracted a blemiſh when it was

(1) *Reſtibilis vinea, reſtibile vinetum*, is a vineyard trenched a-new, and replanted, or the vines that were decayed, reſtored by cutting them, or laying them in order to recover them; *reſtibilis, a reſtituendo*, by the *Greeks* called παλιμφυὲς. But *reſtibilis ager* was land that was ſown every year without intermiſſion, or at leaſt two years immediately following, with bearded or huſked wheat, which they who let their farms provided againſt, becauſe it impoveriſhed the land: on the contrary, land that reſted every other year, in order to recover its ſtrength, was called *novalis, a novando*, tho', properly, *ager novalis* ſignifies land that was never tilled nor cultivated before. And *Pliny* himſelf calls land, from off which old wood was cut, *ager novalis*.

twiſted and bended at the time it was planted. For which reaſon it loſes the greateſt part of its roots, which are broken off it.

But, to paſs over theſe inconveniencies, I cannot, indeed, diſſemble that which is exceeding hurtful; for, a little before, when I was ſpeaking of the uppermoſt part of the ſhoot, which I ſaid was called the *arrow*, I obſerved, that the greateſt part of the fruit commonly grows within the fifth and ſixth eye, which are next to the old branch. Therefore he who twiſts the ſhoot, deſtroys this fruitful part; becauſe both that part which is doubled contains three or four eyes, and the remaining two or three eyes, that would produce fruit, are intirely put under-ground, and thoſe that are hid under-ground don't produce branches, but roots. So it comes to paſs, that what we would have avoided, in planting nurſeries of willows, we put in practice in planting this kind of cutting, which it is neceſſary to make the longer, if we will plant it twiſted. Nor is it to be doubted, but the eyes next to the top, which are unfruitful, are left in it; from which ſprout ſprigs which are either barren, or certainly ſuch as bear leſs fruit, which Ruſtics call *Twigs with ſingle cluſters*. What! Is it not of great importance, that a cutting, which is ſet in the ground, ſhould quickly cloſe up, and form a ſcar in that part where it was cut off from its mother? For, if this is not done, too much moiſture is drawn thro' the open pith of the vine, as it were thro' a pipe, and the ſame makes the ſtock hollow: and hence it is, that ants, and other animals, which conſume the legs of vines, are provided with places to lurk in. But this is what happens to plants that are twiſted: for, when their lower parts are broken, by taking them out of the ground, they are replanted with their pith open and expoſed; and when the waters, and the foreſaid animals, creep into them, they quickly decay, and grow old. Wherefore it is the beſt way to plant the cutting ſtraight, the head of which, when it is put into the fork of the dibble, is eaſily kept faſt in the narrow jaws of the iron tool, and thruſt down into the earth; and that cutting which is ſet after this manner, will ſooner take root, and grow up: for it equally ſends forth roots from its head, where it was cut off from the mother; which, when they grow out of it, form a ſcar upon it: and beſides that, the wound itſelf, looking downwards, does not receive ſo much moiſture as that, which, being bowed back, and turned upwards, tranſmits thro' its pith, as it were thro' a tunnel, all the rain that falls upon it.

CHAP. XIX.

How long the Cutting ought to be.

WHAT length a cutting ought to be of, is not very certain; for, if either it have frequent eyes, it muſt be made the ſhorter; or, if it have them but thin, it muſt be made the longer. Nevertheleſs, it ought not to be more than a foot, nor leſs than three fourths of a foot long, leſt this, being juſt upon the ſurface of the earth, ſhould ſuffer by drought in the time of ſummer; and leſt that, being ſet deeper, ſhould, after it is grown up, be with great difficulty pulled out of the ground. But theſe things with reſpect to the length of a cutting in even flat ground. But in ſloping hilly grounds, where the earth tumbles down, a cutting may be ſet one foot and a palm, or four digits long. In low-ſituated and ouſy plains, we plant a cutting alſo with three eyes, which is a little leſs than nine fingers, but certainly longer than half a foot. And this is not called a cutting with three gems or buds, merely becauſe it has three eyes, ſeeing commonly it is full of eyes about the wound, where it was cut off from its mother; but becauſe, beſides theſe, of which it has many in the head itſelf, it has moreover three joints, and the like number of buds.

Of this alſo, above all other things, I would forewarn him that plants either cuttings or quickſets, *viz.* that he avoid immoderate wind and ſun, leſt the plants wither, and dry up; both which are very eaſily avoided, by throwing a garment, or any ſort of thick covering, over them. Nevertheleſs, it is better to chooſe for our planting a perfectly calm day, or at leaſt when it only breathes a gentle breeze. For the ſun is eaſily kept off by any thing that affords a ſhade. But, before we put an end to our diſcourſe, we muſt ſay ſomething upon a point we have not as yet touched upon; *viz.* whether we ought to have vines of ſeveral kinds, and theſe ſeparate and diſtinct from one another under their ſeveral ſorts, or confuſed and huddled together, one with another. We ſhall diſcourſe firſt of that which we firſt propoſed.

CHAP.

CHAP. XX.

How many kinds of Vines are to be planted.

THerefore it is the part of a prudent Huſbandman, to plant that vine which he has chiefly approved; and always to increaſe the number as much as he poſſibly can, no other ſtem of any other character intervening. But a provident man ought alſo to ſet different ſorts. For the year is never ſo mild and temperate, as not to annoy, with ſome inconveniency, ſome kind of vine or other. For, if either it be dry, that kind which thrives beſt with moiſture, is grieved and diſheartened; or, if it be rainy, then that which delights in drought; or, if it be cold and froſty, then that which cannot endure blaſting cold: or, if it be exceeding hot, then that which does not endure heat, languiſhes. But, not to inſiſt now upon a thouſand injuries of different ſorts of weather, there is always ſomething which may offend and hurt vineyards. Therefore, if we plant but one kind, when that happens which is hurtful to it, we ſhall be deprived of the whole vintage. For he will have no reſerve, no relief, who has not ſtems of divers ſorts. But if we make vineyards of various kinds, ſome of them will eſcape without receiving injury, which may bring forth fruit. Nevertheleſs, this reaſon ought not to force us to ſeek after many varieties of vines; but what we ſhall have diſcovered to be an excellent kind, let us make that as numerous as we are able; then that which is next to the firſt, and afterwards that which is of the third, and even that which is of the fourth note alſo. So far let us be content with a certain *Quaternion*, as it were, of choſen vines. For it is ſufficient with the experiment of four, or, at moſt, five, kinds of vines, to wait the fortune of the vintage.

As to the ſecond thing, which I juſt now propoſed, I am in no manner of doubt, but vines ought to be ſorted and diſpoſed into their particular places and diviſions, according to their kinds; and diſtinguiſhed by foot-paths, and lines and boundaries, from one quarter to to another: not that I myſelf have been able to obtain of my own ſervants, or intimate friends and acquaintance, that any of them ſhould put this in execution; before I did it myſelf, how much ſoever they might approve of the thing. For, of all rural buſineſs, this is the moſt difficult, becauſe it requires the greateſt diligence both in chuſing and gathering the plants, and diſcriminating them, and diſcerning the

ſmalleſt difference in them; in which there is need, for the moſt part, of the greateſt dexterity, prudence, and diſcretion. But ſometimes (as that divine author *Plato* ſays) the beauty and comelineſs of the thing attracts us, and engages us to purſue even after thoſe things, which, becauſe of the infirmity and frailty of our common mortal nature, we cannot obtain. This thing, nevertheleſs, with no great difficulty, we ſhall be able to accompliſh, if we are not too far advanced in years, and if our knowledge and eſtate correſpond with our deſire; altho' it is neceſſary to perſevere for no ſmall part of our life, in order to judge of, diſcern the difference, and make a trial for ſome years of any conſiderable number. For every time of the year does not allow us to paſs a judgment upon this matter. For vines which, becauſe of the ſimilitude of their colour, ſtock, or ſhoots, cannot be known from one another, are very diſtinctly known and diſcovered by their ripe fruit, and by their leaves. That any other perſon, beſides the maſter of the family, can uſe this diligence and application, I will not affirm. For it is acting the part of a careleſs, ſlothful perſon, to commit it to the care of the bailiff, or even of the vine-dreſſer, ſeeing very few Huſbandmen have as yet been able to attain to what is infinitely more eaſy, *viz.* to be intirely free from ſtems that produce black wine, tho' the colour of the grapes may be diſcerned by every the moſt ſtupid and imprudent perſon whatſoever.

CHAP. XXI.

Whether the ſeveral kinds of Vines are to be planted in diſtinct Diviſions, ſeparately by themſelves.

NEvertheleſs, there is one method of effectuating very quickly what we propoſed, which preſents itſelf to me; that, if the vineyards are of an old ſtanding, we ſhould engraft each diviſion thereof with grafts that are diſtinguiſhed and ſeparated into their ſeveral kinds, each ſort having its proper diviſion allotted to it. Thus I don't in the leaſt doubt but in a few years we ſhall gather many thouſand cuttings from the vines we ſhall have engrafted, and ſhall plant in ſeveral quarters and diviſions the plants thus diſtinguiſhed from one another.

Moreover, the advantage of doing this thing may engage us upon many accounts: and that I may begin with thoſe of leſs importance, in the firſt place, in every tranſaction and employment of life, not only

only in Huſbandry, but in every art and ſcience whatſoever, a prudent man is much more delighted with ſuch things as are diſtinguiſhed and ranged into their ſeveral kinds, than with ſuch as are thrown down, as it were, at random here-and-there, and confounded in one common heap.

And, in the next place, that if any one having even the greateſt averſion to a rural life, and the moſt diſaffected to Huſbandry, ſhould come into your grounds when planted regularly, and in due ſeaſon, he may with the greateſt pleaſure admire the bounty of nature, when on that ſide the *Bituric* vines richly laden with fruit, and on this ſide the *Helvolæ*, that are equal to theſe, anſwer to one another; when on that hand the *Arcelacan*, and on the other the *Spionian* or *Baſilican* vines meet together, and ſuit with one another, whereby the kind and nurſing earth, rejoicing and glad at the return of the ſeaſon of the year, (as at a certain everlaſting child-bearing) ſtretches out her breaſts diſtended with new wine. In the midſt of all which, whilſt *Bacchus* cheriſhes the pregnant vine-branches, either of the white or yellow, or of the bright ruddy kind, or of that which glitters with the brightneſs of the purple, *Autumnus* appears every-where in great luſtre, loaden with party-colour'd apples.

But tho' theſe things yield very great delight; nevertheleſs, the advantage is greater than the pleaſure. For, the more beautiful appearance any maſter of a family's eſtate makes, the more willingly does he come down to take a view of it; and what the poet ſays of a ſacred Deity (1),

'Where-e'er the God turn'd his majeſtic head,'

may be truly ſaid of him; for, where-ever the maſter is frequently preſent, and caſts his eyes, there the fruit abounds to a greater degree. But I omit what may accidentally happen to vines that are not ranked according to their ſeveral kinds. I ſhall proſecute thoſe things which are the moſt remarkable.

Stems of a different character neither caſt their bloſſom alike, nor come to maturity at the ſame time. For which reaſon, he who has not his vineyards made into ſeveral diviſions, according to the ſeveral ſorts of vines, muſt of neceſſity ſuffer one of theſe inconveniencies; either he muſt gather his late fruit with that which is early ripe, which thing preſently is the cauſe of acidity; or, if he wait till his late fruit comes to maturity, he may loſe his early-ripe vintage, which, being

(1) *Virg. Georg. lib.* ii. 377.

for

for the moſt part, expoſed to the pillage of the fowls of the air, and haraſſed by the winds and rains, decays, and comes to nothing: but, if he deſires to gather the fruit of each kind at different intervals of time, in the firſt place he is under a neceſſity of undergoing the hazard of the grape-gatherers diſcretion; for he cannot aſſign an overſeer to each of them, to have his eye upon them, and to give them orders, that the bitter unripe grapes be not gathered with the ripe. Moreover, of ſuch vines alſo as are come to maturity, they being of a different character, the taſte of the better is ſpoiled by that which is worſe, and, the taſte of many being confounded into one, the wine will not bear keeping till it be old: and therefore neceſſity forces the Huſbandman preſently to ſell his wine when it is new; whereas, if the ſelling of it could be deferred, either for a year, or at leaſt till the ſummer, it would make a great addition to the price of it.

Now this ſeparating the ſeveral ſorts of vines into diviſions by themſelves, has a very great conveniency, that the vine-dreſſer can more eaſily give to each particular ſort the pruning which is moſt ſuitable to it, inaſmuch as he knows what character the diviſion which he is pruning bears: and this is a thing very difficult to be obſerved in vineyards, which are planted promiſcuouſly with vines of different ſorts; becauſe the greateſt part of the buſineſs of pruning is done at that time when vines bear no leaves whereby they can be diſtinguiſhed. But it is of much importance, whether the vine-dreſſer preſerves and ſets apart for fruit more or fewer firm branches, according to the nature of every ſtem, or whether he encourages and puts a vine forward by leaving long verges upon it, or curbs and reſtrains it by pruning it very near: yea, it is of great importance alſo what quarter of the heavens every kind of vineyard looks to. For every ſort of vine does not delight and rejoice in a hot ſituation; nor, on the contrary, in one that is cold: but young vines have their peculiar property, ſo that ſome of them thrive mightily towards the ſouth pole, becauſe they are deſtroyed by extreme cold; others of them love the north, becauſe they loſe heart, when they are expoſed to the heat: ſome of them rejoice in a middle ſtate, in the temperament of the eaſt or weſt.

He who ſeparates the ſeveral ſorts into diviſions by themſelves, has a due regard to theſe differences, according to the ſituation and poſition of places. He alſo obtains this further advantage, which is not inconſiderable, that thereby he leſſens both the labour and expences of the vintage: for, both ſuch grapes as begin to grow ripe, are gathered in due time, and ſuch as are not yet fully ripe, are deferred to another time without any loſs. Nor does the early and late fruit, gathered at the

the ſame time, hurry the vintage, and force him to hire labourers at any rate. Now this alſo is of very great advantage, to be able to preſerve the true and genuine taſte of each kind, whether it be the *Baſilican*, *Biturican*, or *Spionian*, without any mixture, and lay it up ſeparately by itſelf: which kinds, when they are thus managed, and put up into veſſels, becauſe nothing of a different nature, which may be repugnant to them, is intermixed with them, are ennobled by being kept till they are old (1); for, after fifteen years, or a few more, nothing ignoble can be perceived in their taſte, becauſe almoſt all wines whatſoever, after that time, obtain this quality, that they acquire goodneſs by their oldneſs: wherefore, as we propoſed to ſhew, the diſpoſing and ſeparating the vines according to their kinds, is of the greateſt advantage; which, nevertheleſs, if you cannot accompliſh, the next method to be taken is, that you don't plant any other vines of a different character, but ſuch as reſemble one another in taſte, and yield fruit which comes to maturity at the ſame time. Now (if you have any care or deſire for the apple-kind) you may ſet the tops of fig-trees, pear-trees, and apple-trees, at the ends of the ſeveral rows, in that part of the vineyard which lies towards the north, that ſo, when they grow up, they may not overſhadow it; and, after the ſpace of two years is paſt, you may engraft them; or, if they are of a generous kind, you may tranſplant them when they are full-grown. Theſe are the things I had to ſay, concerning the planting of vineyards. The chief and principal part is ſtill behind, that we give directions concerning cultivating them, of which we ſhall diſcourſe at large in the following Book.

(1) *Per potus tamen nobilitantur.* It is plain, that either theſe words are erroneous, or ſome words are wanting; and *Urſinus* has probably hit upon them, at leaſt his amendment makes the ſentence uniform and intelligible. *Per vetuſtatem nobilitantur*, or *perpetuitate nobilitantur*, and makes them agreeable to what the author ſays, *lib.* iii. 2. *Ad bonitatem aliquam per annos venit*; and *lib.* iv. 20. *Non ſolum ad ſpeciem plurimum refert, ſed ad firmitatem perpetuitatemque.*

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK FOURTH.

CHAP. I.

That Trenches of two Feet are not deep enough for Vine-plants, contrary to the Opinion of Atticus *and* Celſus.

YOU ſay, *Publius Silvinus*, that, after you had read over to ſeveral perſons, that delight in huſbandry, the book which I have written about planting of vineyards, there were found ſome of them, who, tho' they commended the reſt of my precepts, yet found fault with two of them, becauſe I had given my opinion for making too deep trenches for vine-plants, by adding three-fourths of a foot over and above the depth of two feet, which *Celſus* and *Atticus* had determined; and that I had not done very prudently in aſſigning one quickſet to each pole, when theſe ſame authors allowed them, with leſs charge, to cloathe two props next to one another upon the ſame row, with two boughs of the ſame vine, divided and parted from each other: both which objections are founded rather upon an uncertain ſuppoſition, than upon any true judgment.

But, (that I may refute firſt that which I firſt propoſed) if we will content ourſelves with a trench of two feet, why are we of ſuch an opinion as to paſtinate the ground deeper than two feet, ſince we are reſolved to plant the vine ſo ſhallow? Somebody will ſay, We do it, that the lower ground, which lies under the vine, may be ſoft and yielding, that it may not, by its hardneſs, ſtop and repel the young ſmall roots, that gradually creep into it. Indeed this point may be

gained alſo, if the ground be moved with the two foot mattock or ſpade, and the plants be depreſſed into the trenched ground, which is fermented, more than two feet and an half (1); for always, upon a plain, the earth, that is thrown up looſely out of the trench, is more bulky and ſwelled, than the ſame gradation, quantity or extent of crude earth anſwering to it, that has not been moved: nor indeed do plants, when they are ſet, require a deep bed of earth to be made under them; but it is ſufficient to put half a foot of looſe earth under the vines when they are planted, which may receive the gradual growth of the green plants, as it were, into its hoſpitable, and even maternal boſom.

Let us take an inſtance of this matter from ground where trees are planted for ſupporting vines, where, when we have digged the trenches, we lay a very little quantity of duſt under the quickſet: therefore the truer reaſon for our paſtinating the ground deeper is, becauſe in vineyards, where the vines are laid upon frames, they grow up the better, the deeper the trenches are they are planted in: for, trenches two feet deep can ſcarcely be approved even by Huſbandmen that live in the provinces, where the vine, being of a low ſtature, is, for the moſt part, checked, and kept near to the earth; whereas that, which is deſtinated for a frame, muſt be eſtabliſhed upon a deeper foundation; and if ſo be it climbs up higher, it requires more earth, and more aſſiſtance; and therefore, when they are to be wedded to trees, nobody prepares a trench leſs than two feet deep for the vines.

But thoſe principal advantages of ſhallow planting, *viz.* that thoſe plants, which are not wearied by being preſſed down by a great weight of earth, do both grow up quickly to their full ſtature, and become ſtrong, and ſuch as are gently ſuſpended become more fruitful, contribute very little to what the Huſbandman deſires and aims at; for both theſe reaſons of *Julius Atticus* are confuted by the example of the method of planting vines, in order to couple them with trees, which makes the vine both ſtronger and fruitfuller; which it would not do, if the plants ſuffered any injury by being ſunk deeper into the earth. What! does not paſtinated ground, when it is looſe, and newly thrown

(1) Our author directed vines to be planted in trenches made two feet and an half deep in trenched ground. To this it was objected, That the vine was ſet too deep. *Columella* asks, Why we trench the ground ſo deep, if we ſet the vines ſo ſhallow, and do not plant them as deep as we trench? They who made this objection, and blamed him, anſwered, That this was done, that the earth below them might be ſoft, and that the ſmall roots might creep gently into it. *Columella* anſwers, That this may alſo happen, if the earth be moved with the two foot ſpade, and the plants be ſet in trenches more than two feet and an half deep; becauſe the earth, when trenched, and thrown up to a certain height, does ferment and ſwell, ſo that there is place enough for the roots to extend themſelves in.

up, ſwell as if leaven were put into it? and then, before any conſiderable time paſſes, it is condenſed, and ſubſides, and forſakes the roots of the vines, leaving them ſwimming, as it were, upon the ſurface of the ground? But this does not happen ſo readily to our way of planting, which ſets the vine deeper into the earth. As to their ſaying, That the plants ſuffer by cold, when they are deep in the ground, this alſo we don't deny; but it is not the depth of two feet and three-fourths of a foot that can produce this effect, eſpecially conſidering, that, as I ſaid a little before, notwithſtanding vines, which are to be coupled with trees, are ſet deeper in the earth, yet they eſcape the foreſaid inconveniency.

CHAP. II.

That the Branches of one Quickſet ought not to cloathe two Props; but every ſingle Plant muſt have its own Prop aſſigned to it.

THAT other pretence, *viz.* their being of opinion, that two props are, with leſs expence, married to the young ſhoots of one plant, is falſe; for, if either the head itſelf ſhould die, two props are reduced to a ſtate of widowhood, and preſently as many quickſets muſt be ſubſtituted in the room of that which is dead, which, by their number, bring a further charge and burden upon the Huſbandman; or, ſuppoſe it lives, and, as it often happens, ſhould either turn out to be of the black kind, or to be not very fruitful, then the fruit fails, or is naught, not in one prop only, but in more alſo. And even they who have more ſkill than ordinary in Huſbandry, think, that a vine, tho' it be of the generous kind, when it is divided in this manner into two props, will become leſs fruitful, becauſe the roots will interweave under ground, and form a hurdle; and therefore the ſelf-ſame *Atticus* directs us to propagate and renew old vineyards rather by layers, than by laying the whole vines flat in the ground; becauſe layers eaſily ſtrike root preſently, ſo that each vine leans upon, and is, as it were, ſupported by, its own foundation: but that, which has its whole body laid flat, when it has, with its roots running croſs every way, wrought the lower part of the ground like a lettice or net-work, forms a hurdle, and it is vexed and tormented by its many roots being watled into one another; and fails and decays in the very ſame manner as if it had been overburdened with branches:

branches: wherefore, on all accounts, I would rather chuſe to run the hazard of putting two plants into the earth, than one only; and not to purſue that as an advantage, which, every way conſidered, may bring a much greater loſs. But now the argument of the preceding book calls upon us to perform what we promiſed we would begin the following book with.

CHAP. III.

That a Vineyard, newly planted, will ſpeedily decay and periſh, if it is not ſupported by great and aſſiduous Culture.

IN all expenſive undertakings whatſoever, as *Græcinus* ſays, moſt men begin new works with greater courage and reſolution, than they maintain and ſupport them with, after they have finiſhed them; for ſome men, as he ſays, build houſes from the very foundation, and, after they have finiſhed the building, don't provide proper furniture for them. Some are exceedingly active in building of ſhips, and, after they have built them, they neither rig nor man them as they ought to do. Some men are conſtantly employed in buying of cattle, others in purchaſing ſlaves; but they are under no manner of concern about keeping and preſerving them. Many alſo, by their levity, undo and deſtroy the favours they have beſtowed upon their friends. And, that we may not, *Silvinus*, wonder at theſe things, there are ſome men, who, with great covetouſneſs and parſimony, educate their children, which, by marriage, prayers, and vows, they earneſtly ſought for; nor do they cultivate either their mind, or their body, with any kind of diſcipline, exerciſe, or any improvement whatſoever.

What is to be inferred from theſe things? It is this, that, for the moſt part, Huſbandmen alſo are guilty of the ſame kind of fault, who, upon various pretences, abandon vineyards, which they have beautifully planted, before ever they grow up to any perfection. Some avoid a yearly expence, and think, that this is the firſt and the ſureſt income, to be at no expences at all; as if they were under an abſolute neceſſity to make vineyards, which they might preſently, through covetouſneſs, throw up and abandon. Some think it a fine thing to have rather ſpacious than well-cultivated vineyards in their poſſeſſion. I have even known many who are fully perſuaded, that land ought ſtill to be cultivated, whether it be by good or bad methods.

But my opinion is, that as no kind of land whatſoever can be fruitful, unleſs it be diligently, carefully, and ſkilfully manured, ſo more eſpecially vineyards. For a vine is a delicate, tender, and weak thing, and can by no means bear with hard uſage; and, for the moſt part, it is conſumed by too much labour, and bearing too great plenty of fruit; and, if you don't reſtrain it within due bounds, it periſhes by its own fruitfulneſs. But when it has, in ſome meaſure, ſtrengthened and hardened itſelf, and attained, as it were, to the ſtrength of youth-hood, it can bear up under neglect. But a young vineyard, while it is growing up, unleſs it receive all due care and attendance, is reduced into the pooreſt and moſt ſtarving condition, and pines and waſtes away in ſuch a manner, that it can never afterwards, by any expences whatſoever, be recovered and reſtored. Therefore the foundations, as it were, muſt be laid with the greateſt care, and from the firſt day of planting it, it muſt be formed with the ſame care as the members of infants are; which unleſs we do, all our expences will be laid out to no purpoſe; nor can the proper ſeaſon of any thing be recalled, when once we let it paſs. Believe me, *Silvinus*, upon my own experience, that a vineyard well planted, and of a good kind, and under the care of a good Huſbandman, did never fail to requite, with uſury, all the expences and pains beſtowed upon it.

And this the ſame *Græcinus* makes clear to us, not only by reaſon, but by an example alſo, in that book which he wrote of vineyards; where he tells, that he uſed frequently to hear from his own father, that one *Pavidius Veterenſis*, his own neighbour, had two daughters, and a piece of land planted with vines; of which he gave a third part as a portion to his daughter when ſhe married; and, this notwithſtanding, he uſed to gather an equal quantity of fruit out of the two thirds of the ſame land; and that afterwards he gave his ſecond daughter in marriage, with the half of the land that remained; nor did he thereby ſuffer any diminution of his former income. What inference does he draw from this? It muſt certainly be this, that that third part of his farm was afterwards better cultivated, than the whole of it had been formerly.

CHAP.

CHAP. IV.

That the Vine ought to be laid flat in the Trench; and, after bending it back from the Bottom of the ſame, and raiſing it up ſtraight, it ought to be applied to a Reed.

WHerefore, *Publius Silvinus*, let us plant vineyards with great courage and reſolution, and cultivate them with greater application; of the planting of which, that is the moſt commodious method which we have delivered in the preceding book; *viz.* that a trench being made in the paſtinated ground, the vine be laid flat from the middle part of the furrow almoſt, and that the firm-woody part of it be raiſed up ſtraight from the bottom, and applied to a reed. For this, eſpecially, muſt be obſerved, that the trench be not like a conduit, or trough; but that the fronts, or ends of it, be raiſed, as it were, exactly perpendicular, and with diſtinct regular angles. For a vine that is laid down flat, and then ſet in a leaning poſture, in a trough, as it were, is afterwards liable to be wounded when it is ablaqueated: for, while the digger is intent upon digging, ſtrengthening, and raiſing the circumference of the ablaqueation, for the moſt part, he wounds the vine that grows obliquely, and ſometimes cuts it quite thro'.

Therefore we muſt remember to raiſe the ſprig ſtraight up from the bottom of the trench, and apply it to its prop, and ſo bring it to the uppermoſt part or top of it. Then we are to proceed in the other things as we directed in the preceding book: and then, after leaving two eyes ſtanding above ground, to level the trench. Then, having planted cuttings between the rows, we muſt, by frequently digging it, looſen the paſtinated ground, and reduce it into duſt. For thus the cuttings, quickſets, and other plants which we have ſet in it, will take root, thrive, and grow ſtrong, if the ſoft and tender ground convey moiſture to them, and no weeds creep in among them, nor the hardneſs of the ground preſs and ſqueeze the plants while they are young and tender, as if they were bound faſt with fetters.

CHAP.

CHAP. V.

After the Vines are planted, we muſt dig the ground every Month, and take care, that Weeds don't ſpring up in it; and the Quickſets muſt be reduced to one ſingle Branch of Firm-wood.

BUT, to confeſs the truth, the number of times that the ground ought to be turned up with hoes, is not to be determined, ſeeing it is agreed, that the oftener it is digged, the more benefit it will receive. But, becauſe it is proper to ſet due bounds to expences, moſt people think it ſufficient to dig new vineyards every thirtieth day from the firſt of *March* to the firſt of *October*; and to extirpate all ſorts of herbs, eſpecially graſs, which, unleſs they be picked out by hand, and thrown upon the ſurface of the earth, if the leaſt part of them be covered with earth, they revive, and ſo burn up the vine-plants, that they become ſcabby, ſhrivelled, and ruſty.

CHAP. VI.

That ſuperfluous Leaves and Twigs ought to be cut off from Quickſets and Cuttings.

MOreover, whether we have planted our vineyards with cuttings, or with quickſets, it is beſt to form them in ſuch a manner from the beginning, that all ſuperfluities may be plucked off them, by frequent pampination; and that we ſuffer them not to communicate their ſtrength, and all their nouriſhment, to more than one firm-wood branch. Neverthelefs, at firſt, two young branches are ſet apart for growth, that one of them may be for a reſerve, if, peradventure, the other ſhould decay and fail. Then when the rods are a little hardened, all that are of an inferior quality are pulled off: and that thoſe which are left may not be ſhaken off by ſtormy winds, it will be proper to follow them, as they grow up, with a ſoft, ſlack band, till they take faſt hold of their props with their tendrils, as it were with hands.

But, if want of labourers hinder us to beſtow ſo much labour upon the cutting, which, we are of opinion, ought itſelf to be freed from all its luxuriant twigs and leaves; yet, certainly, it ought to be done to vines that are regularly planted in rows, that they may not be emaciated by too many rods upon them, unleſs we are making a proviſion of layers for the time to come, in order to propagate the vine: but that they may miniſter nouriſhment only to one firm-wood branch each, whoſe growth we ought to encourage, by applying a longer prop to them, by which they may creep up to ſuch a height, as to mount above the frame you make for the following year, and be bended, in order to bear fruit. When they are grown up to this height, their tops muſt be broken, that ſo they may rather grow in thickneſs and ſtrength, than be attenuated, by ſhooting out into a ſuperfluous length.

Nevertheleſs, we will pull off all the ſuperfluous leaves and twigs from this very branch, which we ſet apart for firm-wood, as far as three feet and a half from the bottom, and we will often pull off all the nephews, or ſecondary ſhoots, that ſpring out of it within that ſpace. Then, whatever ſhall ſprout out of it above that, muſt be left untouched: for it is more proper, that the upper part be lopped off the next autumn with the pruning-knife, than be pampinated in the ſummer-time; becauſe from that place from whence you have taken away the nephew, or ſecondary twig, it preſently pours forth another; and, after this is ſprung out, there is no eye left in the firm branch itſelf, which may ſprout out with fruit the following year.

CHAP. VII.

That then is the due Seaſon for Pampinating, when the Twigs can be ſtruck off with the Finger.

BUT that is the proper ſeaſon for cutting off ſuperfluous twigs and leaves, when the young ſhoots are ſo tender, that they may be ſtruck off with a ſlight touch of the finger; for, if they are hardened to a greater degree, they muſt either be pulled off with greater effort, or lopped with the pruning-knife, both which are to be avoided; the one becauſe it tears the mother (if you endeavour to pull it off by force); and the other, becauſe it wounds her, which is very hurtful to be done in a green ſtem, as yet not grown up to maturity. For the gaſh does not ſtop exactly in the very place where the edge of the knife made the

the impreſſion, and left its mark; but, in the ſummer heats, a wound deeply impreſſed with the knife, ſpreads to a greater breadth, and withers, and dries up, ſo that it kills no ſmall part of the mother's body itſelf; and therefore, if it be abſolutely neceſſary to apply the knife to young branches which are already grown hard, they muſt be cut off at a little diſtance from the mother, and left as ſtumps or ſhort-cut branches, which may receive the injury of the heat, ſo far as the place where the young twigs ſprout out of her ſide; for the violence of the heat does not creep further.

The ſame method muſt be obſerved in pulling the ſuperfluous leaves and twigs off the cuttings, and in humouring and aſſiſting the firm-wood to grow out in length, if we have a mind to uſe it when it is one year old, which I have often done. But if we are certainly reſolved to cut it, that we may uſe it rather when it is two years old, after you have reduced it to one young branch, and the cutting itſelf exceeds a foot in length, it will be proper to lop off the top of it, that it may grow more firm towards the neck, and become the ſtronger. And this is the firſt culture of plants, after they are ſet.

CHAP. VIII.

That a Vineyard muſt be ablaqueated in the Autumn.

THEN the time following (as *Celſus* and *Atticus*, whom our age has moſt approved, with reſpect to Huſbandry, have declared) requires a more extenſive care. For, after the fifteenth of *October*, before the colds come upon us, the vine muſt be ablaqueated (1); which work lays open and ſhews the hidden ſmall roots, which it put forth laſt ſummer, and the prudent Huſbandman cuts them off with the knife. For, if

(1) *Ablaqueatio, ablaqueare.* This original word is retained by ſome, and if it was commonly underſtood, would be more commodious than a long circumlocution. It ſignifies, to dig round the root of a vine, or any other tree, in order to lay their roots bare, and expoſe them to the air and wind, and with the earth to make, all round the vine, a kind of repoſitory, or baſon, for the water; and to take away the uppermoſt ſuperfluous roots, and thereby the earth is provoked to imbibe the ſun and the ſhowers. It contributes very much to their growth, and is otherwiſe of very great benefit to them; ſo that the oftener the tree is ablaqueated, the better does it thrive, if the nature of the place, and other circumſtances, permit. Authors do not agree about the Etymology of the word: the moſt probable opinion is, that it is formed from *lacus*, the pool, or pond, made round the tree, by digging out the earth, and diſcovering the roots.

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he ſuffer them to grow ſtrong, the roots that lie lower will decay; and the event is, that the vine ſtretches out her roots upon the ſurface of the ground, which are both infeſted with the cold, and ſcorched to a greater degree with the heats, and ſo force their mother to ſuffer a vehement thirſt at the riſing of the Dog-ſtar. Wherefore, when you have ablaqueated the vine, whatever has ſprouted out of it within a foot and an half muſt be cut away.

But the method of amputation in this is not the ſame as was directed with the upper part of the vine: for the wound muſt not be ſmoothed, and the knife muſt by no means be applied to the mother herſelf; becauſe if you cut off the root hard by the ſtock, either more roots will ſpring out of the ſcar, or the winter rain, which ſtagnates and forms a pool in the ſmall hollows that are made round the tree, when it is ablaqueated, will, by its freezing in the middle of winter, chill and gall the new wounds, and penetrate to the very pith. To prevent this, it will be proper to keep at the diſtance of about one finger's-breadth from the trunk, and ſo cut away all the ſmall roots; which, being taken away after this manner, ſprout out no more, and defend the trunk from further injury.

This work being finiſhed, if the winter be mild in that region, the vine muſt be left open; but, if a harder winter forbids to do this, the foreſaid cavities, or little ponds, muſt be filled up, and levelled, before the thirteenth of *December*. But alſo, if you have any ſuſpicion, that the colds of that country will be exceſſive, before you cover the vine with earth, you muſt lay ſome quantity of dung to its roots, or, if it be more convenient, pigeons dung; or you muſt pour upon them ſix *ſextarii* of old urine, prepared for that purpoſe: but you muſt ablaqueate the vine, every autumn, for the firſt five years, till it grow ſtrong. But, when the ſtock is full-grown, the labour of this work muſt be intermitted almoſt for three years: for the legs of the vines are leſs hurt with the iron, and the young ſmall roots don't ſpring out of it ſo quickly, now the ſtock is become old.

CHAP. IX.

After what manner an ablaqueated Vine is to be pruned.

THEN, after the ablaqueation, follows the pruning, which is to be performed in ſuch a manner, that, according to the direction of antient authors, the vine may be reduced to one ſmall rod, and that it be cut ſo as to leave two eyes next to the earth; which pruning muſt not be performed juſt by the joint, leſt the eye be put in fear; but the wound is made with the knife obliquely, almoſt in the middle of the ſpace between the knots, leſt the ſcar, if it were made exactly croſſways, ſhould contain the rain that falls upon it; but neither muſt it decline towards that part where the bud is, but towards the back part, that ſo the cut being made ſloping, it may let its tears fall rather upon the ground than upon the bud: for the moiſture that flows down blinds the eye, and ſuffers it not to put forth its buds.

CHAP. X.

Of the beſt Time for pruning.

THERE are two ſeaſons for pruning; but that of the ſpring (as *Mago* ſays) is the beſt, before the cutting begins to ſprout, and put forth its buds; becauſe, being full of juice, it does not reſiſt the pruning-knife, but receives an eaſy, ſmooth, and equal wound. *Celſus* and *Atticus* were of the ſame mind with him. But we are of opinion, that plants ought neither to be kept too much under, by pruning them too near, unleſs they be very weak; nor be cut by any means in the ſpring of the year. But, indeed, the firſt year they are planted, they muſt be aſſiſted by frequent diggings, every month, while they have leaves upon them; and by frequently pulling off their ſuperfluous leaves and twigs, that they may gather ſtrength, and not miniſter nouriſhment to more than one firm-wood branch. And, after they have educated this, we are of opinion, that, either in the autumn, or in the ſpring, if it be more convenient, every thing that is ſuperfluous upon them ſhould be pared away; and that they be freed from the nephews, or ſecondary twigs, which the vine-dreſſer had omitted in their upper part, and ſo be placed upon the frame. For that vine is ſmooth and ſtraight, with-

out a ſcar, which, with the rod of the firſt year, has raiſed itſelf above the frame, which happens but very ſeldom, and with few Huſbandmen. Therefore the foreſaid authors gave it as their judgment, to cut off the firſt fruits of the vine. But neither, indeed, is pruning in the ſpring of the year beſt in all countries. But where places are expoſed to the ſun, and the winters are mild, pruning in autumn is beſt, and moſt natural; at which time, trees, by a certain divine and eternal law, drop both their fruit and their leaves.

CHAP. XI.

How a Cutting ought to be cut and lopped.

IT is my opinion you ſhould do this, whether you have planted a quickſet, or a cutting: for experience has condemned that antient opinion, that cuttings of one year old ought not to be touched with the knife, becauſe they dread an edge-tool.; which *Virgil* (1) and *Saſerna*, the *Stolos* and the *Catos* (2), were afraid of without any foundation; who not only erred in this, that they ſuffered the firſt year's capillaments of plants to remain untouched; but that after the ſpace of three years, when the quickſet was to be cut, they cut away all the upper part of it to the very ground, juſt by the joint itſelf, that ſo it might pullulate out of the hard wood. But uſe, the maſter of arts, has taught us to form and regulate the growth of cuttings of the firſt year, and not to ſuffer the vine, growing luxuriant with ſuperfluous leaves and twigs, to wax wild; nor, on the other hand, to reſtrain and curb it ſo much as the antients directed, ſo as to cut off all the upper part of it; for this is exceeding hurtful to it: firſt, becauſe moſt of the plants, after you have cut them as low as the ground, (having received, as it were, an intolerable wound) periſh, and ſome of them alſo, which have been ſo ſtubborn as to live, put forth wood-branches, that are not ſo fruitful as otherwiſe they would have been; ſeeing it is allowed by every-body, that ſhoots which ſprout out of the hard part of the vine, are very often deſtitute of fruit: a middle way therefore muſt be followed, *viz* that we neither cut the cutting cloſe to the ground, nor, on the other hand, provoke or encourage it to ſhoot out into firm-wood,

(1) *Virg. Georg. lib.* ii. 362, 369.
(2) *Cato de re ruſtica, lib.* xxxiii. 2.

to a greater length than is requiſite; but, having remarked the thumb (3) of the former year, we may leave, above the very place where the old ſpray was joined to it, one or two eyes from which it may germinate.

CHAP. XII.

After what manner a Vineyard muſt be propped, and of the ſingle Frame for Vines.

NOW, after the pruning, follows the care of propping a vineyard; but this year does not as yet require a very ſtrong prop or ſtake. For I have obſerved, that, for the moſt part, a tender young vine reſts better upon a ſmall prop, than upon a very high ſtrong pole. Therefore we will either apply two old reeds (leſt young ones ſtrike root) to each vine; or, if the condition of the country permits it, ſet old ſpear-ſtaves into the ground, to which may be faſtened ſingle tranſverſe poles toward the lower part of the row; which kind of rail or frame Ruſtics call *Canterius* (a Horſe): it is of very great advantage, that there be ſomething which the tendril, creeping forth, may preſently take hold of, a little below the bending of the vine; and rather ſpread itſelf on each hand on the tranſverſe poles, than grow upwards towards the higher part of a frame; and that, leaning upon the rail, it may more eaſily bear up againſt the winds. It will be proper, that this frame be not raiſed ſo high as four feet, till ſuch time as the vine ſtrengthens itſelf.

CHAP. XIII.

After what manner a Vine is to be tied.

NEXT after the propping follows the binder, whoſe buſineſs is to raiſe the vine ſtraight up to the frame; and, whether it be ſet juſt by the prop, as ſome authors would have it; he that binds it ought

(3) *Pollex.* The antient Husbandmen, when they cut off any ſpray growing out of the ſide of a branch of a vine, and left a ſmall ſtump remaining, not cutting it cloſe to the branch, called that ſtump a *Thumb*, from the reſemblance it bore to the thumb of one's hand.

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to beware of thinking, that he ſhould follow the bending of the ſtake in binding the firm-wood branch to it (if, peradventure, it be crooked); for this makes the vine crooked; or, whether there be a ſpace left between the vine and the prop, (as ſeemed beſt to *Atticus*, and ſome other Huſbandmen, and which I am not ill pleaſed with) the reed muſt be joined ſtraight to the plant, and ſo by ſeveral bindings it muſt be brought up to the frame. It is of great importance what kind of bindings the plants are bound with: for, while the vine is young and tender, it muſt be bound with the ſofteſt that can be found; for, if you bind them with wickers, either of willow or elm, as the vine grows thicker, it cuts itſelf. Therefore broom is beſt for this purpoſe, or bulruſhes cut in marſhes, or long graſs that grows in pools of ſtanding water. Nevertheleſs, the leaves of reeds alſo, dried in the ſhade, are not at all bad for this uſe.

CHAP. XIV.

Cuttings muſt be put upon a Frame, and how high the ſingle Frame, or Rail, muſt be raiſed.

BUT the like care muſt be taken of cuttings alſo, that they be put upon the frame, after they are pruned to one or two eyes, either in autumn, or in the ſpring, before they put forth their buds. The rail, or horſe, as I ſaid, muſt not be raiſed ſo high above the earth, as it is for vines that grow in rows: nor ought it to be more than one foot high, that ſo there may be ſomething to which the yet tender and young branches may bind themſelves with their tendrils, that they may not be rooted up by the winds. Then follows the digger, who is frequently to turn up with hoes the ſurface of the ground equally, and by little and little at a time.

We approve moſt of this even plain digging; for that which in *Spain* they call the *winter-digging*, when the earth is drawn from the vines, and brought into the middle ſpaces between the rows, ſeems ſuperfluous to us, becauſe the autumnal ablaqueation has immediately preceded, which has laid bare the uppermoſt ſmall roots, and reached to thoſe that are undermoſt, and tranſmitted the winter-ſhowers. But the number of diggings ought either to be the ſame with that of the firſt year, or leſs by one; for certainly the ground muſt be frequently ſtirred, till

till ſuch time as the vines, by their growth, overſhadow it, and don't ſuffer the weeds to grow under them.

This year, the ſuperfluous twigs and leaves muſt be pulled off, in the very ſame manner as they were the firſt year. For the puerile age, as it were, of the plants, muſt as yet be kept under due reſtraint, and not more than one rod of the plant be ſet apart for bearing fruit; and ſo much the more indeed, becauſe its tender age cannot endure to be burdened both with offspring, or fruit, and with firm-wood branches.

CHAP. XV.

After what manner a Vineyard muſt be recruited, and how Layers are to be made.

BUT when the vineyard, of one year and an half old, is brought the length of the vintage, after the fruit is taken away, it muſt be ſupplied and filled up with new plants (1); and the preſidiary cuttings (2), which were ſet for that purpoſe, muſt be propagated: or, if we have none of theſe, a layer muſt be drawn from a vine growing in the row, to another ſtake. For it is of very great importance, that every prop be cloathed by ſtill planting a new vine in the room of that which is dead; and not to be afterwards recruiting our vineyard, when we ought to be reaping the fruit thereof.

There is a kind of layer (3) when the vine is bended above the earth hard by the prop, and, being put under-ground, is, by a deep trench, carried to the prop; then from the arch which it forms, it puts forth vehemently a firm-wood branch (4), which, being preſently applied to its

(1) *Vinea frequentanda.* The meaning of this phraſe is, that when any of the regular vines of a vineyard, *i.e.* ſuch of them as grow in the rows, happen to die, their places muſt be ſupplied with other vines from other places; for this purpoſe, the author directs to plant cuttings between the vines, in order to have a ſupply always ready at hand, when they are wanted.

(2) *Malleolus præſidiarius* is a cutting ſet between the vines that grow in rows in a vineyard, in order to ſupply their place, if they ſhould happen to die.

(3) *Mergus*, a layer. This has its name from fowls, that dive into the water. The vine is bended into the earth, and carried under-ground a little way, and then raiſed up again; and ſo reſembles thoſe fowls which dive under water, and riſe up again at ſome diſtance from the place where they firſt plunged into it.

(4) *Tum ex arcu vehementer citat materiam. Citare*, a word frequently uſed by our author, to expreſs a vine's putting forth its buds, leaves, fruit, or roots, as it were ſummoning them to

its own prop, is called up to the frame. Then the following year an inciſion is made upon the upper part of the curvature, as far as the pith, leſt the rod, which is propagated, attract the whole ſtrength of its mother; and that it may learn, by little and little, to be nouriſhed by its own roots. Then, when it is two years old, it is chopped off hard by the young branch, which, from the bow or arch, is ſet apart for growth; and that which is newly cut off from its mother, is preſently digged deep all round; and, a ſmall trench being made, you muſt cut it cloſe by the very bottom of the trench, and cover it over with earth, that it may ſtrike its roots downwards, and not ſprout out towards the ſurface of the earth, after it has been negligently cut too near the ſame. But there is no time fitter for making the amputation of this layer, than from the fifteenth of *October* to the thirteenth of *November*, that ſo it may confirm and fix its roots in the winter-months. For, if we do this in the ſpring, when the vine-branches begin to put forth their buds, being ſuddenly deprived of maternal nouriſhment, it falls into a languiſhing condition.

CHAP. XVI.

At what time a Quickſet muſt be tranſplanted.

THE ſame method muſt be obſerved in tranſplanting a cutting: for, in the ſecond autumn, if the quality of the climate, and of the place, allows it, it is moſt conveniently taken out of the ground after the fifteenth of *October*, and planted. But if ſome hurtful quality, either of the earth, or of the air, be repugnant, then the time for removing it is delayed till next ſpring. Nor muſt it be left longer in the vineyards, leſt it conſume the ſtrength of the ground, and annoy the plants that grow in the rows, which, the ſooner they are freed from the company and partnerſhip of the quickſets, ſo much the more eaſily do they grow, and gather ſtrength. But, in a nurſery, you may keep a vine very ſafely three, yea, four years, when you have cut or pruned it very near, becauſe the vintage is not what you have in view.

to ſhew themſelves. The meaning of this ſentence is, that whenever a vine is bended, and laid in the ground, it vigorouſly putteth forth a ſhoot at the bow, or arched part, which will grow up to be a firm-wood branch; for, in the language of ruſtic writers, *materia* ſignifies, when they are ſpeaking of vines, the woody part, or a ſhoot, which in time will grow up, and become firm-wood.

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When a vineyard has been planted above thirty months, that is, in the third autumn, it muſt preſently be ſupported with ſtronger and higher props: and this muſt not be done juſt as you liſt, or at random; for, whether you fix the prop near to the ſtock, yet you muſt keep at the diſtance of one foot from it, leſt it either preſs upon, or wound the root, and that the digger may dig round the plants on every ſide. And this prop muſt be ſo placed, that it may receive the violence, both of the colds, and of the north winds, and protect the vine; or, whether you fix it in the middle of the ſpace between two rows, you muſt either dig a hole for it, and ſo ſink it into the ground, or you muſt firſt bore the ground with a ſmall ſtake, and then drive the prop deeper into the earth, that it may more eaſily ſupport both the frame, and the fruit. For, the nearer the pale is placed to the ſtock of the vine, the more firm and ſteady it will be, ſuppoſe it be but ſlightly faſtened in the ground; for, being near to the vine, it mutually ſupports, and is ſupported.

Then, upon the ſupporting props, you muſt bind very firm and ſtrong frames; and theſe muſt be made either with willow-poles, or with reeds put, as it were, into bundles, to give them ſufficient ſtiffneſs, ſo that they may not yield, nor ſink down with the weight of the fruit. For now two firm-wood branches muſt be preſerved upon each plant, and ſet apart for bearing fruit; unleſs, notwithſtanding, the ſlenderneſs of any vine ſhall require a cloſer pruning, of which only one fruit-bearing branch muſt be left, with very few eyes upon the ſame.

CHAP. XVII.

After what manner a Frame muſt be made with Reeds.

A Frame made of poles is the firmeſt, and requires leſs labour. Reeds require more labourers to put them together, becauſe they are both tied in more places; and they muſt be bound with their tops turned to one another, that the whole frame may be equally thick; for, if the tops are laid all one way, the weakneſs of that part, being preſſed down with the weight, lets the fruit fall to the ground, when it is juſt ripe, and expoſes it to dogs and wild beaſts. But, when a frame is orderly made of reeds put into bundles, with their tops turned alternately to each other, it will be fit for uſe almoſt for the ſpace of five years.

Nor

Nor is the method of pruning, or of any other part of Culture, different from what it was the firſt two years; for, in autumn, the roots of the vines muſt be carefully laid open, and no leſs care taken to apply new vines by layers to the vacant props; for this work muſt never be intermitted, but let it be renewed every year: for indeed ſuch things as are planted by us cannot be immortal; nevertheleſs we thus uſe our endeavours to make them eternal, by ſubſtituting new plants in the room of ſuch as are dead; nor do we ſuffer the whole generation to be reduced to utter deſtruction by the neglect of many years. Moreover, we muſt beſtow frequent diggings upon them, tho' we may with-hold one digging from the Culture we beſtowed upon them the firſt year. The ſuperfluous leaves and twigs muſt be often plucked off; nor is it enough to do this to the vine once and again the whole ſummer: but eſpecially all thoſe things, which ſprout out below the head of the ſtock, muſt be ſhaken off. Alſo, if each eye upon the frame ſhould ſend forth two young ſhoots, tho' they ſhew us great plenty of fruit, yet one of the ſmall fruit-bearing branches muſt be pulled off, that the firm-wood branch, which remains, may thrive the better, have the better heart, rear itſelf the more chearfully, and educate the fruit that remains the better.

After the one-and-fortieth month, when the vintage is finiſhed, the pruning muſt be ſo managed, that the vine may be ſpread and divided into the form of a ſtar, by ſetting apart ſeveral rods or long ſhoots for bearing fruit. But it is the buſineſs of the Pruner to reſtrain and keep in the vine almoſt within the ſpace of one foot round the frame, that whatever tender thing is ſent forth from the head of the vine all along its arms, may be encouraged and helped forward, and, after bending it over the frame, be precipitated to ſuch a degree, as not to touch the earth.

But a due meaſure muſt be obſerved, in proportion to the ſtrength of the ſtock, leſt more fruit-bearing branches be ſet apart for bearing fruit, than the vine is able to miniſter ſufficient nouriſhment to. But ordinarily the foreſaid age, in a rich ground, where the ſtock thrives very well, requires and allows of three firm-wood branches, ſeldom four, which the Binder ought to ſeparate and divide into as many different parts; for it is to no purpoſe that the frame be decuſſated and made into the form of a ſtar, and be ſpread wide and divided, unleſs the fruit-bearing branches of the vine be ſpread and joined to it in the like manner: which form nevertheleſs all Huſbandmen have not approved of; for many have contented themſelves with extending the vine in one line. But a vine is more ſtable, and abler to bear the burden both

of the young branches and ſprays, and of the fruit, which, being bound on both ſides to the frame, is, by an equal counterpoiſe, kept faſt as with ſo many anchors; as alſo a vine, that is ſupported on every ſide, diffuſes and ſpreads abroad firm-wood branches by more arms, and opens and diſplays them more eaſily, than that which, upon a ſingle rail, is crouded with very many fruit-bearing branches.

Nevertheleſs, if a vine is not ſpread out to a great breadth, and does not bear very much fruit, and has neither a foggy nor a ſtormy climate, it may be ſatisfied with one ſingle frame; for, where rains and ſtorms come with great force and violence, where the vine is weakened by frequent rains, and where it hangs, as it were, upon exceeding ſteep hills, and requires very many defences and ſafeguards, there it muſt be fortified and ſupported all round, as it were, with a ſquare battalion. But, in warm and drier places, the frame muſt be ſtretched out on every ſide, that ſo the ſhoots, creeping forth on all ſides, may be joined, and, being laid cloſe, and compacted together, in the manner of an arched roof, may overſhadow the thirſty earth. On the contrary, in cold and froſty countries, the vines muſt be ranged in ſingle rows in one line; for thus both the ground is more eaſily warmed by the ſun, and the fruit is throughly ripened, and wholſome air will have the more eaſy acceſs to it, and paſs through it the more freely. The Diggers alſo handle and move their hoes and ſpades more freely and eaſily; and the Keepers have a better and more thorough view of the fruit; and the Vintager gathers it more commodiouſly.

CHAP. XVIII.

Of dividing a Vineyard into ſmall Orchards.

BUT, when you ſhall think it proper to put your vineyard into regular diviſions, let one hundred vines be diſtinguiſhed by foot-paths into orchards apart by themſelves; or (as ſome perſons think proper) let the whole compaſs or extent of your vineyard be divided into diviſions of half a *jugerum* each; which diſtinction, beſides that conveniency, that it affords more ſun and wind to the vines, it alſo gives more eaſy admittance both to the eyes and feet of the Proprietor, things extremely ſalutary to vineyards, and affords us a certain rule to go by in eſtimating and exacting that proportion of labour we expect from

from our labourers and ſervants; for we cannot be deceived, when the *jugera* are thrown into equal diviſions and intervals.

Moreover, this very diſtribution into ſmall orchards, the ſmaller the modules or proportions are, into which it is cut, the more it leſſens, as it were, the fatigue, and at the ſame time encourages ſuch as are doing the work to diſpatch it quickly; for commonly the *vaſtneſs* of the preſſing work incumbent upon them diſheartens them, and weakens their courage. It is alſo ſome advantage to know the ſtrength of your vineyards, and how much fruit every part produces, that we may rightly judge which parts we muſt beſtow more or leſs culture upon. Alſo, theſe paths will give convenient room to the Grape-gatherers, and to thoſe who repair the frames and props, by which alſo either the fruits, or materials for ſupporting the vines, may be carried.

CHAP. XIX.

Of the Poſition of a Frame, and how far it muſt be raiſed above the Ground.

AS to the poſition of a frame (1), how far it muſt be raiſed from the ground, it is ſufficient to ſay this, that the loweſt muſt be four feet high, and the higheſt ſeven; which laſt nevertheleſs is to be avoided in young plants: for vineyards ought not to be conſtituted after this manner at firſt; but the vine muſt be gradually carried to this height after a long ſucceſſion of years. But the moiſter the ſoil and the climate are, and the calmer the winds, ſo much the higher muſt the

(1) *Jugum.* As moſt vines have not ſtiffneſs enough to ſtand upright of themſelves, therefore they muſt be ſupported by props, which, being fixed in the ground, and the vines faſtened to them, not only keep them from falling, but preſerve them from being broken by ſtormy winds. When the vine, after it is grown up to a certain height, begins to extend its arms, and ſpread itſelf, then they make frames or yokes (*juga*) to lay them upon, and ſupport them. Theſe they make by fixing two poles or ſtakes in the ground, at a certain diſtance from each other, and alſo from the vine, according to the length of its boughs. To the top of the two erect poles they apply a tranſverſe one, which they faſten to them at each end. This they call a *jugum*, which is commonly made higher than the head of the vine (They call the *head of the vine* that part, from which the arms or boughs iſſue and extend themſelves). Upon this frame they place the *arms*; and, when the vine is ſtrong, and puts forth boughs in abundance, they divide it into four quarters, to each of which they apply a frame, forming it like a ſtar, or the letter X; and this they call *decuſſating the vine, decuſſare, vel in formam decuſſis redigere.* They might add one frame after another, if they had a mind to extend the vine farther; but this was not uſually done.

frame be raiſed; for the thriving condition of vines allows them to ramble, and ſpread, and ſtretch themſelves to a greater height; and the fruit, which is removed to a good diſtance from the earth, is leſs liable to rot; and by this method only the winds blow freely through them, and quickly dry up the fogs, and peſtilentious dew, and contribute much to their caſting their bloſſoms duly, and to the goodneſs of the wine. On the other hand, poor land, that lies on the ſide of a hill, and is parched with the ſcorching heat, or that which is obnoxious to vehement ſtorms, requires a lower frame. But, if all things fall out according to your wiſh, and are agreeable to your deſire, the true and right height of a vine is five feet; nevertheleſs there is no doubt, but the higher the frames are, which the vines riſe up to, of ſo much the better taſte is the muſt which they yield.

CHAP. XX.

Of the Buſineſs of binding Vines.

AFTER the vineyard is propped, and put upon frames, follows the work of the Binder, whoſe principal concern ought to be, to keep the ſtock of the vine ſtraight, and not to make it follow the bending of the ſtake, leſt the crookedneſs of the prop ſhould form the vine after its own ſimilitude. This contributes very much not only to its beautiful appearance, but alſo to its fruitfulneſs, firmneſs, and perpetuity; for a ſtraight ſtock contains a pith like to itſelf, through which, as by a certain way or paſſage, without winding or impediment, the nouriſhment, which the mother *earth* ſupplies it with, paſſes the more eaſily, and reaches to the very top; but ſuch as are crooked and diſtorted are not equally acceſſible to the terreſtrial moiſture (1), the knots hindering, and the bending itſelf, as ſo many rugged uneven places, retarding its incurſion; wherefore, when the vine is drawn up ſtraight to the very top of the ſtake, it is bound faſt to it with a band, that ſo, when it is burdened with fruit, it may not ſink down, and be bended and crookened. Then, from that place, where that which is next to the frame is tied to it, its arms are diſpoſed and diſtributed

(1) *Vineæ curvæ & diſtortæ non æqualiter alliduntur.* Our author, who borrows words and phraſes from a vaſt many different things, and applies them to the ſubject he is ſpeaking of, had, no doubt, in his view here the motion of waters towards the ſhore, and their daſhing upon them; and thereby expreſſes the motion of the juice of the vine towards its branches, which, he ſays, cannot have equal acceſs to them when the vine is diſtorted.

into different parts, and the ſmall fruit-bearing branches, which are placed upon the frame, are, with a band, bended downward: therefore that, which hangs down from the frame, is repleniſhed with fruit. Moreover, the bending or curvature puts forth a firm-wood branch hard by the band.

Some ſpread out upon the frame that part which we precipitate, and, by tying it in ſeveral places with willows, keep it within bounds; which I don't at all think are to be approved: for neither rains, nor hoar-froſts, nor hail, do ſo much hurt to the dependent fruit-bearing branches, as to thoſe that are bound, and expoſed and laid open, as it were, to the ſtormy weather. Nevertheleſs the ſame fruit-bearing branches ought to be tied faſt, before their fruits become mellow, while the grapes are yet of different colours, and bitter, that they may be leſs expoſed to rot with the dews, and to be deſtroyed by the winds and wild beaſts. All along the main broad way, that runs croſs the vineyard from eaſt to weſt, and alſo the ſmaller paths, the fruit-bearing branches of the vines muſt be bended inwards, that they may not be hurt by the incurſions of thoſe, that paſs by. And this is certainly the way to bring a vine to the frame, when it is of ſufficient age and growth for the ſame; for that, which is either infirm or ſhort, muſt be cut to two eyes, that ſo it may, with more ſpeed, put forth firm-wood branches in abundance, which may quickly mount up to the frame.

CHAP. XXI.

Of the Way and Manner of pruning a young Vineyard.

THERE is no other pruning requiſite for a vineyard of five years old, but that it be formed and reduced to a right ſhape, in the manner we have already directed, and that it may not ſpread and extend itſelf overmuch; but that the head of the ſtock be almoſt the ſpace of a foot lower than the frame, and that, with its four arms, which ſome call its old hardened wood, it be divided into as many parts. It will be enough, that one ſingle fruit-bearing branch upon each of theſe arms be ſet apart for bearing fruit, till the vines are of a ſufficient ſtrength. Then, ſome years afterward, when they have attained, as it were, to their juvenile age, it is uncertain how many fruit-bearing branches ought to be left upon them; for a rich fertile ſoil requires more, and that which is poor and lean fewer: for certain it is, that a luxuriant vine,

vine, unleſs it be reſtrained and checked with fruit, caſts its bloſſoms very indifferently, and exhauſts and waſtes itſelf in wood and leaves. On the other hand, that which is weak, when it is burdened with fruit, is afflicted thereby. Therefore, in fat earth, you may, if you will, join two rods to each arm; nevertheleſs you muſt not burden it with a greater number, than that one vine may ſerve or convey nouriſhment to eight fruit-bearing branches, unleſs its too great fruitfulneſs ſhall require more; for a vine, extended with firm-wood branches beyond this meaſure and proportion, has rather the appearance of a long-extended arbour, than of a vine.

Nor ought we ever to ſuffer the arms to become fuller or larger than the ſtock; but, whenever we have it in our power to ſet apart for growth young rods or ſhoots growing out of their ſides, we muſt conſtantly cut away the uppermoſt old hardened boughs, leſt they exceed the frame: but let the vine be always renewed with young fruit-bearing branches, which, if they are grown out to a ſufficient length, may be put upon the frame. But, if any one of them be either broken to ſhivers, or not of a due length, and it occupy a proper place, from whence the vine ought to be renewed the following year, let it be clipped into a *thumb*, which ſome call a *keeper*, others a *ſhort-cut* or *ſtump*, and ſome the *preſidiary branch*, or the *branch of defence*, or *reſerve* (1); that is, a ſprig of two or three eyes, from which, whenever fructiferous firm-wood branches are come forth, whatever part of the old arm is above them, is lopped off; and ſo the vine begins to pullulate, and ſprings up again out of the young branch. And this way of managing well-inſtituted vineyards muſt be perpetually obſerved.

CHAP. XXII.

After what manner old Vineyards are to be reſtored.

BUT, if we ſhall come to the poſſeſſion of vineyards formed after a different manner; and if, by being neglected for many years, they are come up above the frame; it muſt be conſidered what length

(1) *Cuſtos, reſex, præſidiarius*, are names given to the young branches of vines when cut, and they are taken either from the figure or appearance they made upon the bough after they were cut, or from the uſe they were applied to; as for example, a young branch cut pretty near, and ſtanding out a little from the bough, reſembling the thumb, was called a *thumb* (*pollex*); another ſet apart to ſupply the place of that which was next to it, in caſe it ſhould die, was called *cuſtos*, or *præſidiarius*; or it was cheriſhed and put forward, in order to become an arm or bough of the vine, when the old one was taken away.

the old hardened boughs are of, which exceed the foreſaid meaſure; for, if they be two feet long, or a little more, the whole vineyard may yet be reduced into due bounds, and put under the frame, provided the ſtake or prop, which ſupports it, is adjoining to the ſtock of the vine; for the ſtake is removed to a greater diſtance from the vine, and fixed exactly in the middle ſpace between the two old hardened boughs; then the vine is brought acroſs to the prop, and ſo brought under the frame. But, if its old hardened boughs have grown to a greater length, and have crept forth as far as the fourth, or even the fifth prop, they may be reſtored at a greater expence by layers; for a vineyard, renewed and propagated by theſe, comes forward very quickly; and this is what pleaſed us moſt.

Nevertheleſs, if the outſide of the ſtock is grown old and conſumed, it requires greater labour and pains; but, if it be ſtrong and ſound, it requires leſs: for, being ablaqueated in the winter-time, it is ſatiated with dung, and pruned very near; and it is wounded with the ſharp point of an iron tool in the greeneſt part of the bark, between the third and fourth foot from the ground. Then the earth is throughly mixed by frequent diggings, that the vine may be incited and put forward to pour forth young ſhoots or branches in abundance, and eſpecially from that part where it is wounded. But, for the moſt part, a bud comes forth out of the ſcar, which, if it ſtarts out to a greater length, is preſerved and ſet apart for a rod; but, if it is ſhorter, it is ſet apart to be cut into a thumb; but, if it be very ſmall, it is left for a *knob* (1). This may be made of any, even the very leaſt capillament; for when a ſmall ſhoot, with one or two leaves, has crept forth out of the hard part of the vine, provided it comes to maturity the following ſpring, if it be neither cloſe pruned, nor pared away, it puts forth firm-wood branches with great vehemence; which, after it is grown ſtrong, and has made, as it were, an arm of the vine, you may then, if you pleaſe, cut away that part of the old hardened bough, which has extended itſelf, and wandered beyond its bounds, and ſo bring the remaining part of it under the frame or yoke.

Many, from a deſire to ſave time, chop off all the ſtocks of ſuch vines above the fourth foot, fearing no manner of inconveniency from cutting them in this manner; becauſe commonly the nature of moſt part of ſtems does ſo accommodate itſelf to us, that they repullulate, and

(1) *Furunculus*, a knob or knur. It is a ſmall ſwelling of that part of the vine which has been wounded; or it is a bump or *boſſe*, which a vine forms in that part where it is to put forth a bud. The name is taken from a pimple, ſmall ſwelling, or bump in the body.

ſprout

ſprout out again, hard by the ſcar, with new ſhoots and leaves. But indeed this method does not at all pleaſe us; for certain it is, that a larger wound, unleſs it have ſtrong, thriving, hard wood placed above it, by which it may cloſe and grow up again, is parched by the hot ſteams and vapours, and heat of the ſun; then, preſently afterwards, it rots with the dews and rains.

Nevertheleſs, when a vine muſt certainly be cut down, it is proper firſt to ablaqueate it, and then to make the amputation a little below the ground, that the earth, being thrown upon it, may defend it from the violence of the ſun, and give free paſſage to the young ſtems, that break forth from the roots, which may either be married to their own props, that properly belong to them; or, if there are any props in their neighbourhood that are widowers, they may, by means of layers, cloathe them again. But theſe things muſt be done in this manner, if the vines are planted deep, and have not their roots lying looſe, and decaying upon the ſurface of the ground, and if they be of a good kind; for otherwiſe all labour is beſtowed upon them in vain, becauſe ſuch as are baſe and ignoble will retain their former diſpoſition, even when they are repaired and renewed. But ſuch as can ſcarcely adhere to the ſurface of the earth, will utterly decay, before they recover ſtrength: therefore the firſt ſort of vineyard muſt be ingrafted with fruitful grafts; but the other muſt be intirely extirpated, and replanted, provided the goodneſs of the ſoil gives you encouragement; but if, thro' the badneſs of the ſoil, the vineyard is decayed, and grown old, we are of opinion, that it muſt by no means be reſtored.

Moreover, the faults and bad qualities of a place, which bring vineyards to the very brink of deſtruction, are *leanneſs* and *barrenneſs*, *ſalt* and *bitter earth*, *ouſineſs*, *a ſteep-hanging rugged high ſituation*, one that is too gloomy and dark, and not expoſed to the ſun, *ſandy valleys*, alſo *ſandy gravel-ſtones*, and *gravel that is over-much hungry*, and alſo gravel that is bare and naked, and deſtitute of earth, and if there be any other like property, which does not nouriſh a vine: but, if the place be free from all theſe inconveniencies, and others like to them, an old vineyard may be reſtored and repaired in the manner we directed in the preceding book. Again, thoſe vineyards, that are of a bad kind, which, altho' they are very ſtrong, are, through barrenneſs, deſtitute of fruit, are, as we have ſaid, corrected and mended by making ingraftments, of which we ſhall diſcourſe in its proper place, when we come to handle that part of our ſubject.

CHAP.

CHAP. XXIII.

After what manner Vineyards muſt be pruned.

NOW, becauſe we ſeem to have ſaid very little of the pruning of vineyards, we ſhall the more carefully proſecute the moſt neceſſary part of the work we have propoſed. We are of opinion therefore, if the mildneſs, temperateneſs, and clemency of the weather, in that country where they dwell, will allow it, to begin the pruning after the vintage is finiſhed, about the fifteenth of *October*; provided nevertheleſs, that the rains, which fall about the time of the Equinox, are over, and the ſprays, that are to be cut off, are come to their due maturity; for a drought makes the pruning later.

But, if the cold and froſty ſtate of the weather gives us notice of, and preſages, a rough boiſterous winter, we will defer this buſineſs till the thirteenth of *February*; and we are at liberty to do this, if we have a ſmall extent of ground in our poſſeſſion; but where the vaſt extent of our lands does not allow us to chuſe our time, it will be proper to prune the ſtrongeſt and moſt thriving part of our vineyard during the colds, and the pooreſt and leaneſt in the ſpring, or in autumn; and even when the days are ſhorteſt, we may prune ſuch vines as are oppoſite to the ſouth pole; but thoſe that are expoſed to the north, in the ſpring, and in autumn: nor is it to be doubted, but the nature of theſe little trees is ſuch, that the more early they are lopped, ſo much the more wood, and the later, ſo much the more fruit they produce.

CHAP. XXIV.

Of ſuch Things as a good Vine-dreſſer ought to avoid or purſue in a well-conſtituted Vineyard.

WHenſoever therefore a Vine-dreſſer ſhall go about this work, let him principally obſerve three things: firſt, to contribute all he can towards plenty of fruit. Next, let him chuſe the moſt thriving firm-wood branches from among the reſt for the enſuing year. As alſo, let him order matters ſo, as to procure as long a duration for the ſtock as poſſibly he can; for which ſoever of theſe is neglected, it occaſions great loſs to the owner.

But the vine, when it is divided into four parts, looks towards as many different regions of the heavens; which quarters, inaſmuch as they have qualities contrary to one another, require a different method of ordering and diſpoſing of the vine, according to the nature of their ſeveral conſtitutions: therefore thoſe arms of the vine, that are expoſed to the north, ought to receive very few wounds, eſpecially if they be pruned when the colds are now coming on, whereby the places, where they have been cut, will be chilled, and much hurt: therefore one firm-wood branch only next to the frame, and one keeper below it, muſt be ſet apart for growth, which may afterwards renew the vine for one year. But, on the contrary, towards the ſouth, let more fruit-bearing branches be preſerved and ſet apart for growth, which may cover and ſhade their mother, labouring with the ſcorching ſummer-heats, and not ſuffer the fruit to parch and wither before it comes to maturity. There is ſcarcely indeed any great difference in pruning with reſpect to the eaſt and weſt, becauſe the vine receives the ſun an equal number of hours towards both quarters. The meaſure therefore, with reſpect to firm-wood branches, ſhall be that which the richneſs and goodneſs of the ground, and the thriving condition of the ſtem itſelf, ſhall preſcribe.

Theſe things muſt be obſerved in general; but thoſe which follow, require particular conſideration, and muſt be particularly obſerved. For, that I may begin at the lower part of the vine, as at certain foundations, as it were, the earth round the leg of the vine muſt always be removed from it with the hatchet; and if any offspring, which Ruſtics call *Suckers*, adhere to the roots of it, they muſt be carefully pulled up, and it muſt be ſmoothed with the knife, that it may refuſe admittance to the winter-rains: for it is better to pull out the offspring, that repullulates out of the wound, than to leave a knotty and rugged cut. For, by that way, it ſoon cloſes and forms a ſcar; and by this it is made hollow, and rots.

Then having taken a thorough care of the feet, as it were, of the vines, the legs themſelves, and trunks, muſt be carefully viewed all round, and examined, that neither any young branch ſprung out of the ſtock, or any knob like a wart, be left upon them; unleſs it happens, that a vine caſt upon a frame ſhall require to be repaired and renewed from the lower part. But, if that part of the ſtock which is cut, be withered with the heat of the ſun; or if the vine be hollowed by the rains, or by hurtful animals, which creep into it thro' the pith; it will be proper to take intirely away, with the hatchet, whatever part of it is dead: and then, that it be pared to the very quick with the pruning-

pruning-knife, that it may form a ſcar from the green part of the ſtock. Nor is it a difficult thing, ſoon after you have ſmoothed the wounds, to daub them over with earth, which you have firſt moiſtened with lees of oil. For this ſort of daubing hinders the worms, that gnaw the wood, and the ants, to enter; and alſo keeps off the ſun, and the rains. Theſe things make it cloſe its wounds the ſooner, and preſerve the fruit green (1). Alſo the dry bark, which is cloven, and hangs down all along the uppermoſt parts of the trunk, muſt be pulled off as far as its body; becauſe the vine, when it is freed, as it were, from all filth and naſtineſs, thrives the better, and grows ſtrong, and brings leſs dregs with its wine.

Moreover, the moſs alſo, which, like fetters, compreſſes the legs of the vines that are bound therewith, and macerates them with its mouldineſs and naſtineſs, occaſioned by the moiſture which reſts in it, muſt be ſcraped and pared off with the iron. And theſe are the things which muſt be carefully obſerved with reſpect to the lower part of the vine. Let us next give ſuch directions alſo, as muſt be obſerved with reſpect to its head.

The wounds which the vine receives in its hard wood, ought to be made oblique and round; for they recover their health, and grow ſtrong the ſooner; and as long as they have not formed a ſcar, they pour off the water more commodiouſly: tranſverſe wounds both receive, and contain more moiſture. Let the Vine-dreſſer eſpecially avoid this fault. Let him cut off all ſprays that are broad (2), old, ill-ſhaped, crooked, and that look downward; and preſerve, and ſet apart for growth, and for bearing fruit, the young, fruitful, and ſtraight ones; let him preſerve the tender and green arms, and cut away, with the pruning-hook, ſuch as are dry and old: let him pare, or cut off, the one-year old nails (3) of the *keepers*. When he has raiſed his vine almoſt four feet above the earth, let him divide and diſpoſe it regularly

(1) *Coaleſcit celerius, & fructum viridem conſervat.* Some think, that *truncum* ought to be put inſtead of *fructum*, becauſe the author is only ſpeaking of the trunk of the vine: but all the editions have *fructum*. Perhaps the author was of opinion, that the things mentioned in the text contribute to keep the fruit green, and hinder it from drying up and withering.

(2) *Sarmenta lata.* It is not eaſy to determine what the author means by *broad ſprays*, if not ſuch as rather ſpread into thickneſs, than grow out tapering. Some from their own conjecture, and not from any good authority, read *læta* inſtead of *lata*.

(3) *Ungues cuſtodum annotinos.* It has been already explained what our author means by *cuſtodes* (keepers). Here he ſpeaks of *ungues cuſtodum*, the nails of the keepers. To underſtand this expreſſion, it muſt be remembered, that a ſprig or young branch cut off from a branch within a ſmall diſtance from the place out of which it grows, reſembles a thumb; and is ſo called

larly into four arms, and let each of them look towards, and correſpond to a part of, the frame, which is decuſſated, or made in the form of the letter X: then let him leave, upon each arm, one rod for growth, and bearing fruit, if the vine be more ſlender and lean; or two, if it be fuller grown; and having placed them upon the frame, let him precipitate them (4). But we muſt remember, never to ſuffer two or more firm-wood branches to be upon one line, and in one ſide of the arm: for that annoys the vine very much, when every part of the arm does not equally partake of the labour and pain in its turn, and diſpenſe an equal portion of juice to its offspring; but is ſucked and drained of its moiſture on one ſide only: whereby it comes to paſs, that that vein, whoſe intire moiſture is taken away from it, dries up and withers, as if it were ſtruck with lightning.

Alſo there is what is called the *Chop-branch* (5), which uſes to creep out exactly in the middle of a forked bough; and therefore Ruſtics call it by the aforeſaid name; becauſe, ſpringing out between two arms, where the vine divides itſelf, it blocks up its chops, as it were, and bereaves both the old hardened boughs of their nouriſhment; therefore they cut it off carefully as a rival, and ſned it, before it becomes ſtrong. If, nevertheleſs, it has prevailed to ſuch a degree, as to have weakened one of the arms, the weakeſt muſt be taken away, and the *chop-branch* itſelf left to grow in its room. For, when the arm is cut off, the mother conveys ſtrength to both parts equally. Therefore let him conſtitute and fix the head of the vine one foot below the frame, from whence the four arms, as I ſaid, may ſpread themſelves, by which the vine may be renewed yearly, by cutting off the old fruit-bearing branches, and leaving the young ones to grow and bear fruit in their ſtead, of which the choice muſt be made very ſkilfully. For, where there is great plenty of firm-wood branches, the Pruner ought to obſerve carefully, that he neither leave thoſe that are next to the hard-wood, that is, from the ſtock, and the head of the vine; nor, on the other hand,

called by our author. He directs it to be cut obliquely, or ſlanting, which gives the extremity of it the ſhape of the nail of the thumb; and, as this cut is made above the bud, when this ſhoots forth, that part which is called the *nail*, withers, and grows dry: therefore the author orders all ſuch as are of a year old, to be pared away. A cut exactly croſs the wood is called *plaga tranſverſa*; and one that is ſlanting, is called *obliqua*.

(4) *Præcipitare vitis flagellum*, to precipitate a rod, ſignifies, to hang it down over the frame; which poſition contributes more to the plenty and goodneſs of the fruit, than laying it wholly upon, and binding it to, the frame.

(5) *Palmes focaneus*. The author explains this very diſtinctly himſelf: I have tranſlated it, the *Chops Branch*. It grows in the middle, between the two arms of the vine, as *Palla* likewiſe ſays *in Feb.* 12. 2.

thoſe

thoſe towards the extremities. For thoſe contribute very little to the vintage, as they yield but little fruit, being, indeed, like branches, that grow out of the ſtock: and theſe exhauſt the vine, becauſe they load her with too much fruit, and extend themſelves as far as the ſecond or third ſtake, which we have already ſaid is intirely wrong. Wherefore it will be moſt convenient to ſet apart for fruit thoſe branches that grow out of the middle of the arms, which may neither fruſtrate our hopes of a vintage, nor emaciate their own ſtem.

Some men with more greedineſs force as much fruit as poſſible, by ſetting apart for fruit both the middle and the extreme rods, and alſo by cutting the ſprig, that grows next to the hard part of the vine, into a *keeper*; which I don't at all think ought to be done, unleſs the ſtrength of the ſoil, and the ſtock, will allow of it. For they array themſelves ſo with grapes, that they can never ripen, unleſs the ground be exceeding good, and the ſtock itſelf in a thriving condition. The ſubſidiary branch, or *Branch* of *Reſerve*, which is the ſame with the *keeper*, ought not to be cut into a *thumb*, when the branches, from which the next fruits are expected, are ſituated in a proper and fit place. For, when you have bound them, and bended them ſo as to make them look downward towards the earth, you will make them put forth firm-wood branches below the bindings. But if the vine has ſtarted out from the head, to a greater length than the cuſtom of Huſbandmen allows, and has crept with its arms over to the penthouſes formed by the vines upon the other frames, we will leave a ſtrong *keeper*, and the greateſt we can find, hard by the ſtock, of two or three joints, from which, as from a *thumb*, a firm-wood branch ſpringing up, may be formed into an arm the next year, that the vine, being thus cut and renewed, may be contained within the frame.

But, in ſetting apart a *keeper*, and putting it forward for growth, theſe following things muſt be chiefly obſerved. Firſt, that the cut or wound don't look upward to the heavens, but rather downward to the earth: for thus it both protects itſelf from the froſts, and is ſhaded from the ſun. Secondly, that the cut be not made pointed, like to a dart, but like to the ſmall nail of one's finger; for that dies more quickly, and the dead part ſpreads farther: but this is only put in fear, and that but ſlowly, and to no great extent (6). There is alſo a thing, which I obſerve

(6) *Reformidat tarde & anguſtius.* The meaning of theſe two lines is this: The author directs the Pruner to cut the *keeper*, or preſidiary branch, like the nail of one's finger, and not pointed like a dart; becauſe, when the cut is ſharp, pointed, and long, a great part of it dies, and death ſpreads itſelf further; whereas, when the cut is made in the form of the nail of

obſerve is practiſed, and is exceedingly wrong, which ought eſpecially to be avoided; for, while they have great regard to the graceful appearance of the vine, they cut the ſpray hard by the joint, that the *keeper* may be the ſhorter, and like to the *thumb* of one's hand. But this is very hurtful, becauſe the gem, being placed hard by the wound, labours or ſuffers by the froſts and colds, and afterwards by the heat alſo. It is beſt, therefore, to clip the ſubſidiary branch, or branch of reſerve, almoſt in the middle of the ſpace between the two joints, and to make the cut ſhelving downwards behind the gem, leſt it let its tears fall upon it, (as we have already ſaid) and ſo blind the eye when it is budding. But, if we are not provided with a *ſhort-cut branch*, we muſt look about for a knob, which, though it be not extremely near, and reſemble a wart, may put forth a wood-branch the next ſpring, which we may appropriate either for an arm, or for a fruit-bearing branch. If even this cannot be found, the vine muſt be wounded with the iron, and exulcerated in that part where we are deſirous to make a young branch to come forth.

Now I am, indeed, very much of the opinion, that the fruit-bearing branches themſelves ought to be freed from tendrils and nephews. But, in cutting theſe away, a different method muſt be obſerved from that which we obſerve with reſpect to thoſe which grow out of the ſtock: for, whatever it is that jutteth out of the hard part of the vine, muſt be ſned off, and ſcraped away, by applying the pruning-knife more ſtrongly and cloſer to it, that it may the more ſpeedily form a ſcar. On the contrary, whatever ſprouts out of the tender part, as the *nephew* does, is cut off more ſparingly; becauſe, for the moſt part, it has a gem hard by its ſide, joined with it, of which very great care muſt be taken, leſt it be ſtruck off with the pruning-knife. For, if you ſned it very near, with the pruning-knife applied very cloſe to it, it is either wholly taken away, or is ſore wounded: for which reaſon, the *fruit-bearing branch*, which afterwards it will put forth when it germinates, is weak, and will bear leſs fruit; as alſo it is more liable to be hurt by the winds: doubtleſs, becauſe it creeped out of the ſcar in a weak condition.

But it is difficult to determine exactly the length of the *firm-wood branch* itſelf, which we are to ſet apart for growth. Nevertheleſs, moſt people cheriſh and call it forth to ſuch a length, that when

of a finger, the part does not die, but is only put in fear: and this reaches no great way, and but ſlowly; *i. e.* it languiſhes a little, but recovers itſelf again. Theſe are beautiful expreſſions in the original, but, I fear, will have but little grace in an *Engliſh* tranſlation.

it is bended, and precipitated all along the frame, it may not touch the earth. We are of opinion, that theſe following things ought to be conſidered with greater attention: Firſt, the habit and conſtitution of the vine; for, if it be ſtrong, it will ſuſtain larger *firm-wood branches*. Next, we muſt conſider the fatneſs of the ſoil alſo; for, unleſs it have this quality, we ſhall quickly kill even the ſtrongeſt and moſt thriving vine whatſoever, when it is emaciated by longer rods than is proper. But long fruit-bearing branches are valued and eſteemed, not for their length, but for the number of eyes which they have. For, where the ſpaces between the joints are greater, we may, if we pleaſe, lengthen out the firm-wood branch ſo far, till it almoſt touch the ground; for it will put forth but few young twigs and leaves: but where the joints are thick, and ſtand near to one another, and the eyes are frequent, tho' the ſpray be but ſhort, yet it will flouriſh, and grow ſtrong, with many fruit-bearing twigs, and produce a moſt numerous offſpring. Wherefore it is neceſſary to ſet bounds to a vine of this kind eſpecially, that it may not be burdened with fruit-bearing branches of too great a length; and that the Vine-dreſſer conſider, whether the laſt year's vintage was great, or ſmall; for the vines muſt be ſpared after great plenty of fruit, and therefore muſt be pruned very near; but, after producing but a ſmall quantity, they muſt be put upon exerting themſelves.

Over-and-above what has been ſaid, we alſo give this direction, that this work be done with hard iron tools, and the thinneſt and ſharpeſt that can be found; for a blunt, dull, and ſoft pruning-knife is a hindrance to the Pruner, and therefore does leſs work, and occaſions more labour to the Vine-dreſſer. For, whether the edge be laid, which happens to a ſoft iron tool; or whether it penetrates more ſlowly, as is the caſe with one that is blunt and thick; he is obliged to put-to more ſtrength: as alſo rugged and uneven wounds tear the vine; and the buſineſs is tranſacted not by one blow, but by often repeated ſtrokes, whereby, for the moſt part, it comes to paſs, that that which ought to have been cut, is broken, and ſo the vine, being thus butchered and made rugged, rots with the rains, and its wounds are not healed up. Wherefore, the Vine-dreſſer muſt be earneſtly admoniſhed to lengthen the edge of his iron tool, and make it as like a razor as he poſſibly can. Neither let him be ignorant what part of the bill he muſt uſe, in every thing: for I have known very many, who have laid vineyards waſte, through their want of knowledge in this particular.

CHAP.

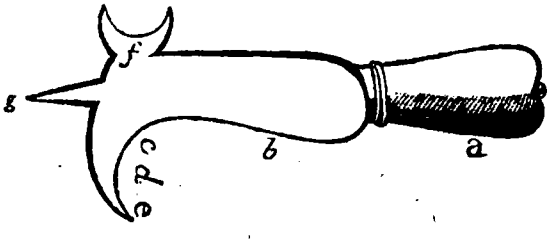
CHAP. XXV.

Of the Figure of the Bill, or Pruning-knife (1).

BUT the ſhape of the bill, or pruning-hook for vines, is ſo contrived, that the part next to the haft, which bears a ſtraight edge, is called the *Knife*, becauſe of its likeneſs to it. That part which is bended is called the *Sinus*, or Hollow; and that part which runs out from the bending, is called the Paring- or Scraping-edge; then that part which is crooked is called the Beak, or Bill. The figure of an half-moon, which is placed above this, is called the Ax, or Hatchet; and its creſt, as it were, which jetteth or ſticketh out from it, is called its Point, or Spike.

Every one of theſe parts performs its own peculiar office, provided the Vine-dreſſer be ſkilful: for, when he wants to cut any thing over-againſt him with a gentle touch of his hand, he uſes the knife; but when he is obliged to draw it back, he makes uſe of the hollow part. When he is to ſmooth any thing, he uſes the ſcraping-or paring-edge: or, to hollow it, he uſes the beak. When he muſt cut it with a ſtroke, he does it with the hatchet; or, when he wants to clear and remove any dirt out of any ſtrait and narrow place, he uſes the point.

But the greateſt part of the work in a vineyard muſt be done, not with hacking and chopping, but by drawing the pruning-knife leiſurely and gently towards you. For that wound which is thus made, is ſmoothed all at once with one impreſſion. For the Pruner firſt applies the iron, and ſo cuts what he deſigned and marked out. But he who falls upon the vine by fetching his ſtrokes, if he miſſes his aim, (which often happens) he wounds the tree with ſeveral ſtrokes. Therefore, that pruning is ſafer, and more profitable, which, as I ſaid before, is performed by



(1) *a*, the haft. *b*, the knife. *c*, the *ſinus*. *d*, the *ſcraper*. *e*, the beak, or bill. *f*, the hatchet. *g*, the point, or ſpike.

gently

gently drawing the pruning-knife towards you, and not by ſtriking with it.

CHAP. XXVI.

Of the Care of propping a Vineyard, and putting it upon Frames.

AFTER theſe things are finiſhed, follows (as we have already ſaid) the care of propping the vineyard, and putting it upon frames; for eſtabliſhing of which, the broad lath or ſtake is better than the round pole, and that muſt not be of any ſort, that comes firſt to hand; for the chief and beſt for this purpoſe is the olive-tree, the oak, or the cork-tree, cloven with wedges, or any other ſtrong wood like to theſe. The round prop obtains the next place; and that which is made of juniper, laurel, and the cypreſs-tree, is moſt approved. Alſo wild or foreſt pine-trees are very proper for this purpoſe; and the uſe of the elder-tree is alſo approved. Nevertheleſs, theſe or the like props muſt be mended and adjuſted afreſh, after the pruning; and ſuch parts of them as are rotten, muſt be cut away; and others of them, which have any ſoundneſs in them, muſt be turned: others of them, which are either carious, or ſhorter than they ought to be, muſt be removed, and ſuch as are fit for the purpoſe put in their room. Thoſe that are lying upon the ground muſt be ſet up, and ſuch of them as ſtoop muſt be ſet upright. If the frame does not ſtand in need of any new reparation, let freſh bindings be put upon it. But if it ſhall ſeem to want repairing, before ever the vine be applied to the prop, let it be faſtened together with poles or reeds; and then afterwards (as we directed with reſpect to the new vineyard) let us bind the vine with the ſtake that ſupports it, juſt by its head, and below its arms; and this muſt not be done every year in the ſame place, leſt the band cut it, and ſtrangle the ſtock.

Then we will place the arms into four diviſions, in form of a ſtar, and bind the tender fruit-bearing twigs or branches upon the frame, not forcing them contrary to their nature; but each of them muſt be gently bended, according as it will yield and obey, leſt it be broken by bending it, or leſt the gems or eyes, that are now ſwelling, be rubbed off. And where two firm-wood branches are extended over one part of the frame, let a middle ſtake intervene; and let the branches run directly out from them ſtraight along the ſhelvings or pents of the

frames, and with their tops look towards the earth, as if they were layers: and, that this may be done ſkilfully, let the binder remember not to twiſt the young vine-branch, but only to bend it gently, and tie it; and that every firm-wood branch which can be preſently precipitated, be placed upon the frame, that it may rather hang down leaning upon the pole, than hang down from the binding. For I have often remarked, that Ruſtics, thro' imprudence, put a fruit-bearing branch under the frame, and bind it to it in ſuch a manner, that it hangs under it only by the willow; which vine breaks and falls down, when it receives the weight of the ſhoots, and of the grapes.

CHAP. XXVII.

What Things a good Vine-dreſſer ought to avoid or purſue in a Vineyard already conſtituted, and put into good Order.

OUR vineyards being thus put into good order, we will then make haſte to cleanſe them, and free them from ſprays, and broken pieces of reeds; which nevertheleſs muſt be gathered when the ground is dry, leſt the earth, being trodden upon when it is miry, ſhould occaſion greater labour to the Digger, who muſt preſently be brought in, and ſet to work, while the vines are yet ſilent; for, if you ſend in the Digger when the branches of the vines begin to ſprout, and put forth their buds, you will ſhake off a great part of your vintage: therefore vineyards muſt be digged as deep as may be during the interval between the winter and the ſpring, before they begin to put forth their buds, that they may pullulate the more joyfully and chearfully; and, when theſe have arrayed themſelves with leaves, and cluſters of grapes, bounds muſt be ſet to the tender ſhoots, before they grow to their full length. And the ſame Vine-dreſſer, who before made uſe of the iron tool, ſhall now ſhake them off with his hand, and check and keep the ſhadows within due bounds, and beat off the ſuperfluous twigs and leaves; for it is of very great importance not to do this unſkilfully, ſeeing ſhredding off the ſuperfluous ſhoots and leaves is of greater advantage to vines, than pruning them; for, tho' this is a great help to them, yet it wounds and mangles them; *that* cures them more gently, and without a wound, and contributes to make the next year's pruning more expeditious: as alſo it ſaves the vine from a vaſt many ſcars, which it would otherwiſe have, becauſe that, out of which any tender or green thing has been pulled,

pulled, does quickly close and heal up. Moreover, the firm-wood branches, which have fruit, thrive better, and grow strong; and the grapes, being more commodiously basked, are throughly ripened.

Wherefore it is the business of a prudent and very skilful Vine-dresser to consider, and carefully to look, in what places he ought to set apart firm-wood branches for the year, and not only to pull off the vine such branches as have no eyes or buds, but also those that are fertile, if they shoot forth in number beyond all bounds; forasmuch as it happens, that certain eyes bud out with, and put forth, three fruit-bearing twigs, of which two must be pulled away, that they may the more commodiously educate one single pupil each: for it is the part of a wise Husbandman to consider and discern, whether a vine has not arrayed herself with a greater quantity of fruit, than she is able to bear and go through with the full time. Therefore he ought to pluck off not only the superfluous leaves and twigs, which indeed must always be done, but sometimes to beat off her some part of her offspring, that so he may lighten and ease the vine, overburdened with her own fruitfulness. And this an industrious careful person, employed to pull off the superfluous twigs and leaves, will do for several reasons, altho' there should be no more fruit than what may be in a condition to come to maturity; for, if the vine has been wearied with an abundant product for several preceding years without intermission, it will be equal and just, that it should rest, and refresh and recover itself; and so the good and advantage of the future firm-wood branches must be consulted: for it is a business proper for any person whatsoever, even suppose he were a boy, to break off the tops of the rods, in order to check their luxuriancy; or to take out of the way the shoots, that rise out of the hard part, or out of the stock of the vine, unless it be necessary to preserve one or two of them for restoring and repairing her; as also to pluck off every green thing, that sprouts out of her head between her arms, and to cut off all those barren branches, which spring out of the arms themselves, and seize upon the mother's nourishment, and employ and weary her to no purpose.

CHAP. XXVIII.

How a Vineyard ought to be pampinated; and how many Diggings are neceſſary for ſufficiently cultivating it.

BUT the time for pampinating or pulling off the ſuperfluous twigs and leaves (1) muſt eſpecially be choſen, before the vine ſhews her flower; but afterwards you may reſume and return to the ſame work again: therefore, in the intermediate days, during that ſpace of time wherein the berries are formed, they deny us acceſs into vineyards, becauſe it is not expedient to move the fruit while it is in the bloſſom; but, when it is paſt its puerile ſtate, and grown up to its juvenile age, as it were, or come to its full growth, it is proper to rebind it, and to ſtrip it of all its leaves, and alſo to plump it by frequent diggings; for, by frequent pulverations (2), it becomes more plentiful, and grows into better plight.

Nor do I deny, that moſt maſters of Huſbandry before me were content with three diggings; of whom *Græcinus* is one, who expreſſes himſelf thus: *It may ſeem ſufficient to dig a conſtituted vineyard thrice. Celſus* alſo and *Atticus* agree, that there are three natural motions in a vine, or rather in every tree or ſprig whatſoever; one, whereby it may germinate; another, whereby it may bloſſom; and a third, whereby it may ripen: therefore they think, that theſe motions are excited by diggings; for nature does not ſufficiently effectuate what ſhe deſires, unleſs you aſſiſt her with labour and ſtudy. And this is the care that is to be taken in cultivating vineyards, which the vintage puts an end to.

(1) *Pampination* is pulling off the ſuperfluous ſhoots and leaves of vines, a word not uſed by our gardeners, ſo far as I have obſerved, tho' they have adopted ſeveral other *Latin* words not ſo difficult as this to be expreſſed by an *Engliſh* word; for this cannot be fully expreſſed without uſing ſeveral words. *Pampinus* is a young ſhoot, that groweth out of the branch of a vine, and from it is formed *pampinare*. This is a work mightily recommended by all ruſtic writers, as very beneficial to vines.

(2) *Pulveratio* is digging the ground all round the vine when it is dry, and raiſing the duſt ſo as to cover the grapes with it. This, our author ſays in his book of trees, *cap.* 12. is of great benefit to them, becauſe it defends and preſerves them from the ſun, and from fogs.

CHAP. XXIX.

Of ingrafting Vines, and preſerving the Ingraftments.

I Return now to that part of my argument, where I engaged to give directions about ingrafting of vines, and preſerving the ingraftments. *Julius Atticus* has told us, that the time of ingrafting is from the firſt of *November* to the firſt of *June*, till which time, he affirms, that a cyon may be kept without germinating; and by this we ought to underſtand, that no time of the year is to be excepted, if we can be maſters of a ſpray or graft, that is ſilent (1). I might grant indeed, that that might be done in other kinds of trees, which have a firmer and more juicy bark. But, with reſpect to vines, it is contrary to my honeſt and faithful way of acting to diſſemble, that it is too raſh and unadviſed to allow Huſbandmen to ingraft them during ſo many months; not that I am ignorant, that ſometimes a vine, ingrafted about the middle of winter, takes hold. But we ought to teach learners, not what may accidentally happen in one or two experiments, but what, in a certain regular way, under certain circumſtances, may, for the moſt part, ſucceed; for, if the experiment is to be made only upon a ſmall number, in which greater care is a cure for their raſhneſs, ſo far I can give my conſent. But when the vaſtneſs of the work does alſo extend and inlarge the care of the moſt diligent Huſbandmen, we ought to remove all manner of ſcruple.

For there is a contradiction in what *Atticus* directs: for he denies, that it is right to prune a vineyard in the middle of winter, which, tho' it does leſs hurt to the vine, nevertheleſs, for very good reaſons, is forbidden to be done, becauſe, in great colds, all ſorts of ſhoots whatſoever are chilled and benumbed with the cold; nor, by reaſon of the cold, give they any motion to the bark, ſo that it may cloſe and heal up with the wound: and the ſame *Atticus* does not forbid to ingraft at the very ſame time, which he then directs to be done, both by chopping off the head of the whole vine, and making a cleft in the very ſame part where the cut is made. Therefore the truer way of ingrafting is after the winter is paſt, now when the days are warm, when the vines naturally move both their buds and their bark, and when there is no cold wea-

(1) *Sarmentum ſilens.* This a phraſe commonly uſed by our author, *Pliny*, and other ruſtic writers, to denote a branch or ſpray of a tree, or of any plant, that has not as yet begun to put forth its buds.

ther approaching which may chill and dry up, either the cyon that is ingrafted, or the wound that is made by the cleft. Nevertheleſs, I would allow ſuch as are in great haſte, to ingraft a vine in autumn; becauſe the quality of the air at that time is not unlike to that of the ſpring.

But what time ſoever any perſon ſhall fix upon to ingraft in, let him know, that there is no other care to be taken in trying and examining the cyons, than what is delivered in the preceding book, where we gave directions about chooſing of cuttings. After he has pulled off the vine ſuch cyons as are generous and fruitful, and the ripeſt that he can find; let him alſo chooſe a warm day, calm and free from wind: then let him look out for a cyon that is round, and of a firm body, but not of a ſpungy pith, with frequent eyes or gems alſo, and ſhort joints or diſtances between the knots. For it is of great importance, that the cyon, which is ingrafted, be not long; and alſo, that there be many eyes in it, from which it may put forth its buds. Therefore, if the diſtances between the knots be long, it is neceſſary to cut the cyon to one, or at moſt to two eyes, leſt we make it of a greater length than to be able to endure both ſtorms, and winds, and ſhowers, without being moved. But a vine is ingrafted, either when it is cut, or when it is bored through with an augre, without cutting it. But *that* ingrafting is more frequently practiſed, and is known almoſt to all Huſbandmen; *this* is rarer, and practiſed but by few. I ſhall therefore diſcourſe of that firſt, which is more in uſe.

For the moſt part, the vine is cut above the earth; ſometimes, nevertheleſs, below it alſo, in the place where it is moſt ſolid, and moſt without knots. When it is ingrafted even with the earth, the graft is covered with earth to the very top: but when it is higher above the earth, the clift is carefully daubed over with well-wrought clay, and bound up after it has had moſs placed upon it, which may defend it both from the heats and the rains. The cyon is ſo ſhaped, that, being not unlike to a pen made of a reed, it may exactly anſwer to, and fill up the cleft, under which it is requiſite there ſhould be a knot in the vine, which may, as it were, bind up that cleft, and not ſuffer the chink to proceed further. Tho' this knot be four digits diſtant from the place where the cut is made; yet it will be proper to bind it faſt, before the vine be cloven, leſt when a way is made with the knife for the graft, the wound ſhould gape more than is fitting. But the graft ought not to be ſmoothed more than three digits, and that it may be equally ſmooth on that ſide where it is pared. And this paring is carried ſo far, that it may touch the pith on one ſide, and be ſcraped a little

farther than the bark on the other ſide, and the cyon formed into the ſhape of a wedge; ſo that it may be ſharp on the lower part; and be thinner on the one ſide, and thicker on the other; and that, being put into the cleft by the thinner ſide, it may be cloſely faſtened on that ſide where it is thickeſt, and may touch the cleft on both ſides. For, unleſs the bark of the one be applied ſo cloſe to the bark of the other, that the light cannot ſhine thro' it in any place, it cannot coaleſce.

There are more kinds of bands for graffing than one: ſome bind it faſt with willows; ſome wrap the cleft round with the rind of a tree; very many bind it with a bulruſh, which is the fitteſt for this purpoſe. For the willow, when it is dried, penetrates and cuts the bark. For which reaſon, we approve more of ſofter bindings, which, after they are bound round the ſtock, are made ſtraiter and cloſer, by driving in ſmall wedges made of reeds. But the principal thing to be obſerved is, that, before all this, the vine be ablaqueated, and the uppermoſt roots and ſuckers cut away; and that, after all, the ſtock be covered over with earth; and, after it has taken hold of the graff, it again requires another care. For it muſt be very often pampinated, when it puts forth its buds; and the ſuckers, which creep out of the roots and ſides of it, muſt be frequently pulled off. Alſo that which ſhoots out of the place where the ingraftment was made, muſt be carefully bound up, leſt the cyon, being moved with the wind, ſhould be weakened, or the tender ſhoot be pulled away by the root; which, when it is grown to any conſiderable length, muſt be bereaved of all its nephews, unleſs, by reaſon of the penury and baldneſs of the place, it be ſet apart and reſerved for layers. Then autumn applies the pruning-knife to the young branches that are come to maturity, and fit for it. But this method of pruning is carefully obſerved in vines that are graffed, that where there is no occaſion for reſerving a layer, one ſhoot be called up to the frame; and the other be ſo cut, that the wound be made even with the ſtock; nevertheleſs, that it be ſo made, that nothing be pared off from the hard wood. The ſuperfluous leaves and twigs muſt be pulled off it no otherwiſe than you do off a young quickſet: and we muſt ſo prune it, as to be very ſparing in commanding it (2), and putting it upon exerting itſelf till the fourth year, till ſuch time as the wound of the ſtock cloſes up, and forms a ſcar. And this is the order and method to be obſerved in Cleft-graffing.

(2) *Imperare viti*, commanding the vine, *i. e.* ſetting apart many fruit-bearing branches, and putting it forward to produce much wood and fruit; the contrary to which is pruneing it very near, and hindering it to exhauſt itſelf.

But,

But, in that which is performed by terebration, you muſt firſt mark out the fruitfulleſt vine in the neighbourhood; from which you may draw to you a young branch (as a twig ſtill adhering to the mother) and put it thro' the hole. For this is the ſafer and ſurer way of ingrafting, becauſe, tho' it does not take hold the next ſpring, yet, certainly, the following ſpring, when it is grown bigger, it is forced to unite with the other; and preſently afterwards you cut it off from its mother, and ſo chop off the upper part of the vine, that is ingrafted, hard by the place where it received the cyon. But if you have not the conveniency of this ſort of cyon growing upon its mother, then you make choice of a ſpray or ſhoot, plucked as freſh from off the vine as poſſible; and, after you have pared it all round ſo gently, that the bark only may be pulled off it, you fit it to the hole, and ſo you daub the vine, *whoſe top* you have cut off, all round with clay, that the intire ſtock may ſerve, or *miniſter nouriſhment* to, a vine of a different kind; which, indeed, is not done in a graff, which ſtill adheres to its mother, and is nouriſhed by the mother's breaſt till it grows into the other vine.

But the iron tool, wherewith our anceſtors perforated the vine, is intirely different from that, which I myſelf have found by experience to be fitter for that purpoſe. For the old augre, which antient Huſbandmen were only acquainted with, did make a kind of ſaw-duſt, or filings, and it galled and burned that part which it perforated. Moreover, the burnt part did ſeldom revive, and recover itſelf, and coaleſce with the former; nor did the cyon, that was ingrafted upon it, take hold of it: as alſo the ſaw-duſt, or filings, was never taken out ſo intirely, that ſome of it did not remain in the hole. Moreover, this by its intervention hindered the body of the cyon to be applied cloſe to the body of the vine. We, having contrived what we call the *Gallic* Gimlet, for this kind of ingraftment, find it much more proper and uſeful; for it makes a hollow in the ſtock, ſo as not to burn the hole; becauſe it does not make, as it were, a ſaw-duſt, or filings, but ſhavings; which being taken out, a ſmooth wound is left, which may more eaſily touch, on every ſide, the cyon which is ſeated in it, when nothing of that flock, which the antient augre raiſed, intervenes. Therefore take care to have your ingraftment of vines finiſhed about the vernal Æquinox. In barren and dry places, graff the black vine; in ſuch as are moiſt, the white: neither is there any neceſſity of propagating, if ſo be that the ſtock is of ſo middling a thickneſs, that the growth of the cyon, which is ingrafted into it, can cover the wound or cut that is made in it; except, nevertheleſs, that the vacant place of the head of a vine that is dead, requires another vine. When this is the caſe, one

of

of the cyons is turned down for a layer, the other is carried up to the frame, and ſet apart for bearing fruit. Nor will it be uſeleſs to educate ſuch ſhoots as grow out of the arched part of the vine, which you have put down for a layer; which ſhoots you may afterwards either make layers of, if it be proper, or leave them for fruit (3).

CHAP. XXX.

Of Directions relating to Props for Vines, and to Oſiers, and Willow-groves.

FOraſmuch as we have already diſcourſed of ſuch things as we thought might be uſefully delivered as precepts and directions for conſtituting and cultivating vineyards; a method muſt *now* be laid down, for making proviſion of props, frames, and oſiers: for theſe things are provided beforehand, as certain dowries or portions for vineyards. Which things if the Huſbandman be deſtitute of, he has no motive or encouragement to make vineyards, ſeeing all the things that are neceſſary, muſt be ſought for at a diſtance from his own ground: and not only the price that he pays when he purchaſes them, (as *Atticus* ſays) is a burden in the accounts of the charges of his vineyard; but alſo the procuring ſuch things is exceeding troubleſome. For they muſt be carried and brought together in winter, which is a very inconvenient time for it. Wherefore proviſion muſt be firſt made of willow-roots, and grounds planted with reeds, common woods, or woods planted on purpoſe with cheſnut-trees. One ſingle *jugerum* of willow-ground (as *Atticus* thinks) may ſuffice for binding twenty-five *jugera* of vineyard: a ſingle *jugerum* of ground, planted with reeds, is ſufficient for furniſhing frames for twenty *jugera*: and a *jugerum* planted

(3) It is evident, as *Geſnerus* obſerves, that this laſt paragraph is imperfect, and things not ſo clearly expreſſed as is uſual with this author. But his meaning ſeems very obvious: his deſign is to teach when it is neceſſary to inſert two cyons into the cleft of a vine. He ſays, it is not neceſſary when the ſtock is of ſuch a moderate thickneſs, that, by the growth of one graft, it may fill up, and ſoon coaleſce. On the other hand, he ſays, it is neceſſary to ingraft two cyons into one ſtock, when it is larger than to be able to coaleſce with one cyon only; or when, in its neighbourhood, the head of ſome vine is dead, and it is neceſſary to ſupply it with a layer. It is obvious to any who conſiders it, that this muſt be the ſenſe of the author, tho' the firſt part of the ſentence, *neque eſt ulla propagandi neceſſitas*, be very ambiguous; and perhaps he means, that, when a vine can be rightly ingrafted, there is no neceſſity of propagating by layers, which requires more labour.

with cheſnut-trees is enough for propping as many *jugera*, as a *jugerum* planted with reeds can furniſh frames for.

Land that is either well watered, or ouſy, nouriſhes the willow exceedingly well; nevertheleſs, that which is level and fat, is not at all improper for it. And it ought to be turned up with the ſpade two feet and a half deep (for ſo the antients direct); nor is it of any importance what kind of willow you plant, provided it be exceeding tough and flexible. Nevertheleſs they think, that there are three principal kinds of the *Willow*; the *Greek*, the *Gallic*, and the *Sabinian*, which moſt people call the *Amerine*. The *Greek* is of a yellow colour; the *Gallic* of a ruſty purple colour, and of a very ſmall with or rod; the *Amerine* willow bears a ſlender, bright, reddiſh-coloured rod: and of theſe you either plant the tops, or ſet them in cuttings. The topmoſt rods of a moderate thickneſs, which nevertheleſs don't exceed the thickneſs of a hoop for a veſſel of two feet circumference, are very proper for ſetting, if they be put down ſo deep into the ground, as to be even with it. Cuttings a foot and a half long, being immerſed into the ground, are covered over therewith but a very little: a place that is well watered requires wider ſpaces between them, and thoſe of ſix feet, in the quincunx order, do very well: a place that is naturally dry requires ſmaller diſtances between each, but ſo, that they who cultivate them, may have eaſy acceſs to them. It is ſufficient, that the diſtances between the rows be five feet; but that, nevertheleſs, in the very line where they are planted, there be empty ſpaces of two feet left between each plant, the vacant ſpaces and the plants ſucceeding each other alternately. The proper time for ſetting them is before they bud, while the rods are ſilent, which it is proper to pull off the trees when they are dry: for, if you cut them off when the dew is upon them, they thrive and come forward but very indifferently. Therefore, in pruning the willow, we avoid rainy days. The firſt three years, willow-grounds muſt be frequently digged, as you do new vineyards: afterwards, when they are grown ſtrong, they are content with three diggings; when they are cultivated in a different manner, they quickly decay. For, tho' great care be taken, yet very many willows periſh. In the place of which others ought to be propagated by layers from thoſe that grow near at hand, by bending their tops, and putting them under-ground, whereby whatever is periſhed may be replaced. Then let the layer, when it is a year old, be cut off from its ſtock, that it may be nouriſhed by its own roots.

CHAP.

CHAP. XXXI.

Of Broom.

VERY dry places, which don't admit of that kind of ſprig-nurſeries, require broom. As a band made of this is ſtrong enough, ſo alſo it is exceeding tough. You ſow the ſeed of it, which, when it is grown up, you either tranſplant it when a quickſet of two years old; or, being left to *grow where it was ſown*, after it is paſt that age, it may be cut down every year hard-by the ground, after the manner of corn. Other ſorts of bindings, ſuch as thoſe made of bramble, require more pains; but nevertheleſs very neceſſary, when there is a ſcarcity of them. The willow, for poles, requires almoſt the ſame land as that for withs. Nevertheleſs it comes up, and thrives better, in land, that is well watered; and it is ſet in cuttings; and, when it has germinated, it is ſo formed as to grow up into one pole. You muſt frequently dig round it, and root out the weeds, and pull off its ſuperfluous leaves and twigs, no leſs than you do thoſe of a vine, that it may be called forth, and made to ſhoot forth, rather into length of branches, than into breadth. When thus cultivated. you cut it at fartheſt the fourth year; for that, which is prepared for bands, may be cut, when it is one year old, about two feet and a half from the ground, that it may ſprout out of the trunk, and be divided into arms or boughs, like a low vine. Nevertheleſs, if the land be drier than ordinary, it muſt be cut when it is two years old.

CHAP. XXXII.

Of Ground planted with Reeds.

THE reed does not require ground that is paſtinated ſo deep; nevertheleſs it thrives better when it is ſet in ground that is turned up with the ſpade two feet deep: and, foraſmuch as it is exceeding lively, it does not refuſe any place whatſoever. It thrives better when it is ſet in looſe ground, than in that which is thick; in moiſt, than in that which is dry; in valleys, than upon hills or riſing grounds; and it is planted more commodiouſly upon the banks of rivers, in borders and thickets, than in the middle of lands. The bulb of the root of it

is planted; they alſo ſet cuttings of the cane; and it is as common to lay the whole body of it flat in the ground. The bulb, being put under ground, with vacant ſpaces of three feet between each, yields a full-grown pole in leſs time than a year. The cutting, and the whole reed laid flat, comes later to maturity than the foreſaid time; but whether you ſet it in cuttings of two feet and a half, or the whole reeds be laid flat, their tops muſt appear above-ground; for, if they be wholly put under-ground, they rot intirely. But the culture of grounds, planted with reeds, is not different the firſt three years from that of other grounds before-mentioned. When it is become old, it muſt be trenched again: and this is its old age; when either it becomes dry and withered, and is overgrown with moſs and naſtineſs, by being neglected for many years; or when it is ſo crouded with reeds, and they grow ſo cloſe together, that they grow up ſlender, and like ſmall canes. But *that* ought to be digged again anew, and *this* may be cut down here-and-there, and thinned; which work Huſbandmen call *caſtrating:* which way of cutting nevertheleſs of a reed-plot is acting at random, and in the dark, becauſe it does not appear by the ground, what ought either to be taken away, or left. Nevertheleſs it can better bear with being caſtrated before the reed is cut down; inaſmuch as the ſmall canes point out, as it were, and ſhew what ought to be rooted out. The time of repaſtinating, and of ſetting them, is, before the eyes of the reeds ſhoot forth. Then the time for cutting them is after the middle of winter is paſt; for it always continues to grow till that time, and then it receives a check, when it grows ſtiff with the winter-cold. A reed-plot muſt be digged as often as a vineyard; but its leanneſs may be relieved with aſhes, or other dung: for which reaſon moſt people ſet it on fire after it is cut down.

CHAP. XXXIII.

Of Cheſnut-trees, and Cheſnut-groves.

THE cheſnut-tree is next to the oaks called *robora* (1), and therefore very proper for eſtabliſhing and firmly ſupporting vineyards; for its nut, being planted in paſtinated ground, ſtarts up, and ſhews itſelf

(1) *Robur*, an oak. There are ſeveral ſorts of oaks, differing from one another either in their growth and ſtature, figure of their leaves, bigneſs and ſhape, hardneſs and colour of their fruit, and ſeveral other qualities, which I need not mention. Authors differ very much

itſelf quickly, and, after the ſpace of five years, being cut down, it recovers itſelf, and grows up again in the manner of a willow-grove, and, being made into a ſtake, it laſts almoſt till another cutting. It requires a black and looſe earth; it does not diſlike a moiſt coarſe ſand, nor the broken, crumbling, ſandy gravel-ſtone; it rejoices, and thrives exceeding well, upon a hill or riſing ground, ſheltered from the ſun, and expoſed to the north; it is afraid of a cloſe thick ſoil, and of that which is full of red-okre. It is planted, from the month of *November* during the whole winter, in dry ground, and which has been trenched two feet and a half deep. The nuts are ſet in a row, and at the diſtance of half a foot; but the rows are ſeparated by ſpaces of five feet from each other. The cheſnut is committed to furrows ſunk three-fourths of a foot deep; and, when the ſame are ſet with nuts, before they are filled up with earth, and levelled, ſhort reeds are ſet up at the ſide of the cheſnuts, that, by theſe marks and indications of the place where they are planted, they may be digged and weeded with the greater caution. As ſoon as the plants are grown up to have a ſtem (2), they muſt be

much about their ſeveral kinds and names. *Pliny* ſays, that, in *Germany*, there were vaſt woods of the *robur*; and ſeems to think, that it is the ſame with what the *Greeks* call δρῦς, from which, he ſays, the *druids*, a kind of *magi* among the *Gauls*, took their name, they taking great delight in groves of this kind of tree, and performing no religious ceremony without the leaves thereof. *Pliny*, who, no doubt, was well acquainted with this tree, ſays, that it bears a ſmall acorn; beſides which, it produces ſeveral other things, *viz.* both black and white galls, and a fruit reſembling mulberries, excepting that they are dry and hard, in which there is incloſed a fruit like the kernel of an olive. Likewiſe it produces ſmall balls or pills, which have a kind of flax within them very fit for lamps; as alſo another ſort of pill or ball, with hair upon it, which, in the ſpring, yields a juice, which taſtes like honey; as alſo that it breeds, in the hollows between the boughs and the trunk, certain ſmall pills, which ſtick cloſe to the wood, without any pedicles, which, toward their navel, are whitiſh; but, over the other parts, are ſpeckled with black ſpots, only in the middle they are of a ſcarlet red colour. Theſe, and ſeveral other peculiarities, which he mentions at large, *lib.* xvi. *cap.* 8. are ſufficient to diſtinguiſh this from other ſorts of oaks. Father *Hardouin* is very poſitive, that the *robur* is the δρῦς ἀγρία of *Theophraſtus*; and that it has no name in the *French* language.

Quercus is another ſort of oak frequently mentioned by our author. *Pliny* ſays, that it bears both the beſt and the largeſt acorns; that of the female is ſofter and ſweeter than that of the male, which is thicker and cloſer; that it has the ſtrongeſt and moſt durable wood; not being ſo ſubject to rot, full of boughs, and has a taller and thicker trunk, than the other ſorts of oaks. It ſeems, that even of the *quercus* itſelf there are different ſorts. *Pliny* mentions the *quercus latifolia*, the broad-leav'd oak; which, father *Hardouin* ſays, is always green in the country of *Anjou* in *France*; and they call it *le grand cheſne*, the great oak. He is very poſitive, that the *quercus* is the φηγὸς of *Theophraſtus*.

(2) *Simulatq; ſemina ſtillaverint.* It is not eaſy to determine what the author means by this ſentence. *Geſnerus* ſays, that there is ſome reaſon to think it ought to be *ſtilaverint*, from *ſtilus* a ſtem or ſtalk, as *gemmare* from *gemma*, and *germinare* from *germen*, &c. *i. e.* as ſoon as the ſeeds are ſprung up, and have formed a ſtile or ſtalk, they may be pulled up, and tranſplanted. But as all manuſcripts and editions have *ſtillaverint*, perhaps the author

be plucked up here-and-there; alſo they may be tranſplanted when they are two years old; and there muſt be two feet of empty ground left between each, without any of the little trees upon it, leſt their being too thick and cloſe upon one another emaciate the plants. But the ſeed is planted thicker, becauſe of various accidents; for ſometimes the nut, before ever it ſprings out of the earth, either withers or dries up intirely with droughts, or rots with too much water. Sometimes it is infeſted by ſubterraneous animals, ſuch as mice and moles: for which reaſons young cheſnut-groves often grow bald, and wax thin; and, when they are to be replaced, and made thicker, it is better, if it can be done conveniently, that a pole, growing hard-by, be bended in the manner of a layer, and propagated, than to take it out of the ground, and replant it; for *that* germinates vehemently, and ſhoots forth vigorouſly, as having never been moved out of its own ſeat; but *this*, which is taken up by the root, and planted again, is in terror for two years afterward: for which reaſon it is found to be more convenient to raiſe woods of this ſort from nuts, than from quickſets.

The ſpaces of ground above-mentioned of this kind of planting will receive two thouſand eight hundred and eighty heads of cheſnut-trees; according to which number, (as *Atticus* ſays) every ſingle *jugerum* will eaſily yield twelve thouſand props or ſtakes; for the cuttings, that are cut off neareſt the ſtem, will, when cloven, for the moſt part, furniſh us with four ſtakes; and then the ſecond cuttings of the ſame tree will yield two; which kind of cleft prop laſts longer than the round pole. The culture of digging and ſetting is the ſame as that of the vineyard. It ought to be pruned when it is two years old, and alſo when three years; for, in the beginning of the ſpring, it muſt twice feel the edge of the knife, that it may be incited and put forward to ſhoot forth in length.

The oak-tree alſo may be planted in the ſame manner; but it is cut down two years later than the cheſnut-tree: and, becauſe of this, reaſon requires, that we ſhould rather gain time, unleſs mountains, that are gravelly, and full of thickets, and thoſe kinds of earth, which we have already mentioned, ſhall require the acorn, rather than the cheſnut. Theſe things concerning *Italian* vineyards, and the furniture and implements of vineyards in general, have I, at full length, and not unprofitably, ſo far as I can judge, diſcourſed of. I ſhall by-and-by give an account how the provincial Huſbandmen cultivate their vineyards, and of the culture and management of trees planted for ſupporting vines, both in our own country, and in *Gaul*.

author means, that, as ſoon as the ſeeds have put forth their ſtalks or ſtems, and that the young ſhoots ſprout out from them, ſo that the rain drops from them, then they are fit for tranſplanting.

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK FIFTH.

CHAP. I.

YOU ſaid, *Silvinus*, that, in the former books, which I had written to you concerning conſtituting and cultivating vineyards, there were ſome things wanting, which they, who applied themſelves to the ſtudy of rural affairs, did mightily wiſh for; nor do I deny, that I have paſſed over ſome things, tho' I have carefully inquired and examined what both the Huſbandmen of our own age, and alſo the antients, have delivered to the records of learning. But, when I undertook to teach publicly the precepts of Huſbandry, if I miſtake not, I did not confidently ſay, that I would treat of all, but of the moſt part of thoſe things, which the vaſt extent of that ſcience comprehended; for that could never fall within the compaſs of one man's knowledge and ſkill: neither is there any diſcipline or art whatſoever, that has been conſummated, or brought to perfection, by the genius and capacity of one ſingle man. Wherefore, as one that traces and ſearches for wild beaſts in a great wood, ſhews himſelf to be a good hunter, if he catches very many of them, nor was it ever charged as a fault upon any man, that he did not catch them all; ſo it is abundantly enough for us to have treated of moſt things belonging to ſo diffuſe a ſubject as we have undertaken; foraſmuch as the things, which are wanting, and are required, as if they were omitted by us, do not properly belong to our profeſſion, as very lately, when our friend

M. Trebellius required of me a method for meaſuring of lands, he gave it as his opinion, that it had ſo near a relation to, and was ſo connected with one's ſubject, who demonſtrated after what manner we ſhould paſtinate land, that we ought to give directions alſo how to meaſure it; which, I ſaid, was not the buſineſs of an Huſbandman, but of a ſurveyor or meaſurer, eſpecially when architects, who muſt needs know the way and method of meaſuring, don't indeed vouchſafe to comprehend the dimenſion of buildings when they are finiſhed, and which they themſelves have diſpoſed, and put into due order; but they think, that one thing belongs to, and is ſuitable to their profeſſion, and another to theirs, who meaſure things already built, and who, by making a calculation, compute the amount of the work, that is completely finiſhed: whereby I am of opinion, that our art ought the more to be excuſed, if it proceeds only ſo far, as to tell after what method every thing muſt be performed, but not the *quantum* of what it has done.

But becauſe you alſo, *Silvinus*, in a familiar manner, deſire, that we ſhould give you rules and directions for meaſuring, I'll comply with your deſire, upon this condition, that you make no doubt, that this is rather the buſineſs of Geometers, than of Huſbandmen; and that you will pardon any error or miſtake I may fall into in a thing I don't pretend to have a perfect knowledge of. But to return to my ſubject: The quantity or extent of every area is known by a foot-meaſure, which conſiſts of XVI digits (1); a foot multiplied proceeds to *paces*, and *actus* or furlongs, and *clima's*, and *jugera*, and *ſtadia*, and *centuriæ*; afterwards alſo into greater ſpaces. A *pace (paſſus)* contains V feet (2). The ſmalleſt *actus* (as *M. Varro* ſays) has IV feet in breadth, and in length CXX (3). A *clima* is LX feet every way (4). A ſquare *actus* is termi-

(1) The ſmalleſt meaſure of length mentioned by our author is *digitus latus*, or *tranſverſus*, a digit or finger's breadth, which is properly $\frac{1}{4}$ of an inch, and is equal to four grains of barley laid breadthwiſe, ſo as to touch one another. This, he ſays, was the ſixteenth part of a foot; and the *Roman* foot, as has been ſaid before, according to the *Engliſh* ſtandard, is 11,604 inch dec.; and of this foot-meaſure they compounded ſeveral others here mentioned by our author, to all which they gave their peculiar names, which, when mentioned, raiſed in the mind the idea of a certain number of feet, as *paſſus*, *actus*, *clima*, *jugerum*, &c. to which, I believe, very few nations at preſent have, in their own language, names of meaſures, that exactly correſpond. The foot was the ſmalleſt land-meaſure.

(2) The *paſſus*, a pace, contained five feet; and we are told, that it was ſo called *a paſſis pedibus*, from the feet extended in walking.

(3) *Actus*, as *Pliny* tells us, *lib.* XVIII. *c.* 3. is the length of a furrow, as far as a plough goes before it turns; and is properly tranſlated, in *Engliſh*, a furlong; and, as a determinate meaſure, is 120 feet. They had their *actus minimus*, and their *actus quadratus*. Our author, from *Varro*, tells us, that the *actus minimus* had 120 feet in length, and four in breadth (which words are not in the copies of *Varro* which we now have; and he makes no

terminated by CXX feet on every ſide (5). This *ſquare-actus* doubled makes a *jugerum*; and from the two *ſquare-actus* joined the one to the other, it took the name of *jugerum* (6). But the Ruſtics of the province of *Bætica* call this *ſquare-actus*, Acnua (7); and theſe ſame call a breadth of XXX feet, and a length of CLXXX, *porca* (8). But the *Gauls* call a ſpace of C feet in *areas* in a city, and a ſpace of CL feet in *areas* in the open fields, *candetum*; which the plowers call *cadetum* (9): they call alſo half a *jugerum Arpennis* (10). Therefore (as I ſaid) two *actus* make a *jugerum* of CCXL feet in length, and CXX in breadth; both which ſums, multiplied into one another, make twenty-eight thouſand and eight hundred ſquare feet. Then a *ſtadium* (11) contains CXXV paces, that

no mention of this *actus* in the 10th chap. of his firſt book, where he treats of the meaſures of land). The ſquare feet in this *actus minimus* are only 480; ſo that ſome late authors muſt be miſtaken, who make it the ſixth part of the *jugerum*, (*jugeri ſextans*) *viz.* 4800 ſquare feet.

(4) The *clima* had 60 feet every way, *i. e.* 3600 ſquare feet, and was the *ſeſcuncia* of the *jugerum*, *i.e.* $\frac{1}{12}$ parts of it, and $\frac{1}{24}$, or, with reſpect to the number of ſcruples in the *jugerum*, is $\frac{24}{576}$ parts of it.

(5) The *actus quadratus*, or ſquare furlong, being 120 feet every way, was equal to the half of the *jugerum*, and contained 14400 ſquare feet.

(6) Two *actus quadrati*, joined together, made a *jugerum*, which, as our author ſays, from this junction, took the name of *jugerum*. This ſhews, that it is a miſtake to ſay, that this meaſure was called *jugerum*, becauſe it contained as much land as a yoke of oxen can plow in one day; for we learn from *Varro*, *lib.* i. *cap.* 2. that ſuch a quantity as this was called *jugum*, which was a certain meaſure they uſed in ſome parts of *Spain*; *in Hiſpania ulteriore metiuntur jugis, jugum vocant; quod junctі boves uno die exarare poſſunt.* A wrong reading in *Pliny's nat. hiſt. lib.* XVIII. *cap.* 3. gave occaſion to this notion; and father *Hardouin* has, from this place of *Varro*, very judiciouſly corrected it, and changed *jugerum* into *jugum*; and the place itſelf ſhews the correction to be juſt, becauſe *Pliny* afterwards tells us what conſtitutes the *jugerum*, and ſpeaks of it as a thing he had not mentioned before. The two *actus quadrati*, joined, make 240 feet in length, and 120 in breadth, the ſquare of which is 28800, the number of ſquare feet in a *jugerum*.

(7) *Acnua*. Our author ſays, that the Husbandmen in *Bætica* called the *actus quadratus* by this name; ſo that he ſeems to make it a *Spaniſh* word; but *Varro* makes it a *Latin* word. It has ſo many different readings, that it is difficult to ſay which is the true one. Probably it might have been in *Spain* a corruption of the word *actus*.

(8) *Porca*, a certain meaſure uſed in *Bætica*, conſiſting of 180 feet in length, and 30 in breadth. *Porca* commonly ſignifies the ridge or raiſed part of plowed land, as *lira* ſignifies the furrow, or depreſſed part. Probably in plowing that delightful country they threw the land into ridges of that dimenſion.

(9) *Candetum*. *Iſidorus* ſeems to think, that this is only a corruption of the word *centetum*, a meaſure of 100 feet.

(10) *Arpennis* or *arepennis*. This, our author ſays, is a *Gallic* word; and probably from it comes the *French* word *arpent*: but the number of feet in it does not anſwer either to thoſe of the *jugerum*, or of the half of the *jugerum*.

(11) The *ſtadium* is originally a *Greek* meaſure. Some ſay it was the length of the race-ground at *Piſa* in *Elis*, where the *Olympic* games were celebrated, and was 600 feet long. It came to be in uſe among the *Romans*. But both *Columella* and *Pliny* ſay, that a *ſtadium* was 625 *Roman* feet; ſo that either the *Greek* foot was longer than the *Roman*, or it may

that is, DCXXV feet, which, multiplied by eight, make a thouſand paces, which amount to five thouſand feet. We now call (as the ſame *Varro* ſays) an extent of two hundred *jugera* a *centuria* (12); but formerly it was called a *century*, from one hundred *jugera*; but afterwards, being doubled, it retained the name, as the tribes (*tribus*) were at firſt ſo called from the people's being divided into three parts, which, being now multiplied, nevertheleſs retain their antient name. Theſe things it was proper briefly to premiſe, as not foreign to our purpoſe, nor remote from the calculation we are going to deliver.

Now let us come to the purpoſe. We have not laid down all the parts of a *jugerum*, but only thoſe that fall into the eſtimation of work done. For it was needleſs to inſiſt upon the ſmaller parts, for which no conſideration or reward is paid down: therefore (as we ſaid) a *jugerum* (13) contains twenty-eight thouſand and eight hundred ſquare feet; which feet make, or anſwer to, CCLXXXVIII ſcruples. But, that I may begin with the leaſt part; that is, with half a ſcruple. The five hundred ſeventy-and-ſixth part of a *jugerum* makes fifty feet; that is, half

be true what ſome authors ſay, that the *ſtadium* was marked out by *Hercules* himſelf, and meaſured by the length of his own foot, which, in proportion to his ſtature, was longer than that in common uſe. It was the eighth part of the *Roman* mile which conſiſted of 5000 feet.

(12) *Centuria*. This is the largeſt meaſure of land mentioned by *Columella*, which, at firſt, was ſo called, becauſe it conſiſted of 100 *jugera*. When *Romulus* diſtributed two *jugera* a man to the people, it ſeems, for diſtinction-ſake, they threw an hundred of theſe ſmall parcels of land together, and called them *Centuria*, every man having his own particular portion aſſigned him, which was called *Hæredium*, becauſe it went to his Heir; ſo that 100 of theſe ſmall inheritances made 200 *jugera*.

(13) In order to underſtand the account *Columella* gives of the diviſions of the *jugerum*, it is neceſſary to know, that the *Romans* uſed to call any integer, which came under conſideration, by the name of *as*, which was a great braſs coin, which at firſt weighed 12 ounces; and, to expreſs any part of the integer, they called it by the name of the diviſion of the *as*, which correſponded to it: thus, to expreſs a man's inheriting the whole eſtate, they ſaid he was *Hæres ex aſſe*; or the half of it, *Hæres ex ſemiſſe*, and ſo forth, thro' all the diviſions of the *as*, which, conſiſting of 12 ounces, was divided into 12 parts, each of which had its own particular name; thus $\frac{1}{12}$ was called *uncia*; $\frac{1}{6}$ *ſextans*, or two ounces; $\frac{1}{3}$ was called *trions*, or four ounces; $\frac{1}{4}$ *quadrans*, or three ounces; and $\frac{5}{12}$ they called *quincunx*, or five ounces; the half of the *as* they called *ſemis*, or ſix ounces; $\frac{7}{12}$ they called *ſeptunx*, or ſeven ounces; $\frac{2}{3}$ they called *bes*, or eight ounces; $\frac{3}{4}$ they called *dodrans*, or nine ounces; $\frac{11}{12}$ they called *dextans*; and $\frac{12}{12}$ they called *deunx*.

And when they had occaſion to mention any ſmaller diviſions of an integer, they gave it the name of a diviſion of the *uncia*, of which there were ſeveral diviſions. I ſhall only mention ſuch of them as *Columella* makes uſe of. And firſt they divided it into two *ſemiuncia's*; ſo that, with reſpect to the *as*, or integer, the *ſemiuncia* was $\frac{1}{24}$. The next diviſion was into four *ſicilici*, or quarters of an ounce, ſo called, from its cutting the half ounce, which was $\frac{1}{48}$ of the integer. Another diviſion of the *uncia* was into ſix *ſextula*, each *ſextula* being $\frac{1}{6}$ of the *uncia*, and $\frac{1}{72}$ of the *as*, or integer. The laſt diviſion of the *uncia*, which

half a ſcruple of a *jugerum*. The two hundred eighty-and-eighth part of a *jugerum* makes a hundred feet; that is, a ſcruple of a *jugerum*. The hundred forty-and-fourth part makes cc feet; that is, two ſcruples. The two-and-ſeventieth part makes cccc feet; that is, the ſixth part of the ounce, wherein there are four ſcruples. The forty-eighth part of a *jugerum* makes DC feet; that is, the fourth part of an ounce, wherein are ſix ſcruples. The twenty-fourth part makes one thouſand two hundred feet; that is, half an *ounce*, in which are XII *ſcruples*. The twelfth part makes two thouſand four hundred feet; that is, one *ounce*, in which are XXIIII *ſcruples*. The ſixth part makes four thouſand and eight hundred feet; that is, two *ounces*, in which are XLVIII *ſcruples*. The fourth part makes ſeven thouſand and two hundred feet; that is, three *ounces*, in which are LXXII *ſcruples*. The third part makes nine thouſand and ſix hundred feet; that is, four *ounces*, in which are XCVI *ſcruples*. The third part, and one twelfth part of a *jugerum*, make twelve thouſand feet; that is, five *ounces*, in which are CXX *ſcruples*. The half of a *jugerum* makes fourteen thouſand and four hundred feet; that is, ſix *ounces*, in which are CXLIIII *ſcruples*. The half, and one twelfth part, make ſixteen thouſand and eight hundred feet; that is, ſeven *ounces*, in which are CLXVIII *ſcruples*. Two third parts make nineteen thouſand and two hundred feet; that is, eight *ounces*, in which are CXCII *ſcruples*. Three fourth parts make twenty-one thouſand and ſix hundred feet; that is, nine *ounces*, in which are CCXVI *ſcruples*. The half, and one third, of a *jugerum* make twenty-four thouſand feet; that is, ten *ounces*, in which are CCXL *ſcruples*. Two thirds, and one *fourth* part, make twenty-ſix thouſand and four hundred

which our author takes notice of, is into 24 *ſcripula*, or *ſcriptula*, which the *Greeks* call γεγμμαὶα. According to this diviſion of the *uncia*, a ſcruple is $\frac{1}{288}$ of the *as*, or integer. *Columella*, in his diviſions of the *jugerum*, goes as low as the half of the ſcruple, which he calls *dimidium ſcrupulum*, and is $\frac{1}{576}$ of the *as* or *jugerum*.

I know there are other diviſions of the *uncia* mentioned by other authors, *viz.* into 8 drachms, each of which contained 3 ſcruples; and into 3 *duellæ*, each of which contained 8 *ſcrupula*; and into 7 *denarii*. Our author once only ſpeaks of a thing being of the weight of the *denarius*, but does not tell what proportion it bore to the *uncia*. But *Plin. Nat. Hiſt. lib.* xxxiii. *cap.* 9. ſays, that their juſt weight was 84 in a pound, which is 7 in the ounce.

From what is ſaid, one may eaſily underſtand all that our author ſays of the *jugerum*, conſidered as an integer divided into a certain number of parts, to each of which he gives the name of the diviſion of the *as* correſponding to it, as half a *ſcruple*, a *ſcruple*, *ſicilicus*, *ſextula*, *uncia*, *ſemuncia*, &c.; and this gives light to any other *Roman* author uſing the ſame method of expreſſing the part of any integer.

What has been ſaid is more diſtinctly expoſed to the eye in the following table, which begins with the ſmalleſt or loweſt diviſions of the *jugerum* conſidered as an integer, exactly

hundred feet; that is, eleven *ounces*, in which are CCLXIIII *ſcruples*. A *jugerum* makes twenty-eight thouſand and eight hundred feet: this is the *as*, or the integer, in which there are CCLXXXVIII *ſcruples*. But if the compaſs of a *jugerum* did always ſo quadrate, and had, in taking the meaſure of it, CCXL feet in length, and CXX in breadth, the calculation of it would be very expeditious. But, becauſe different forms of lands come under conſideration, we ſhall ſubjoin examples or figures of every kind, which we may uſe as formula's for our direction.

in the ſame manner as *Columella* himſelf conſidered it, who begins with half a ſcruple, and riſes gradually till he comes to the integer.

The ſeveral Parts and Diviſions of the Jugerum *mentioned by* Columella, *with the Number of* Roman *and* Engliſh *ſquare Feet each Part and Diviſion contained.*

The *Roman* Names of the Diviſions of the *Jugerum*.	Scruples	Parts.	*Roman* ſquare feet	*Engliſh* ſquare Feet Decimals.
Dimidium Scrupulum,	$\frac{1}{2}$	$\frac{1}{576}$	50	48,35
Scrupulum,	1	$\frac{1}{288}$	100	96,70
Duo Scrupula,	2	$\frac{1}{144}$	200	193,40
Sextula,	4	$\frac{1}{72}$	400	386,80
Sicilicus,	6	$\frac{1}{48}$	600	580,20
Semuncia,	12	$\frac{1}{24}$	1200	1160,40
Uncia,	24	$\frac{1}{12}$	2400	2320,80
Sextans,	48	$\frac{1}{6}$	4800	4641,60
Quadrans,	72	$\frac{1}{4}$	7200	6962,40
Triens,	96	$\frac{1}{3}$	9600	9283,20
Quincunx,	120	$\frac{5}{12}$	12000	11604.
Semis,	144	$\frac{1}{2}$	14400	13924,80
Septunx,	168	$\frac{7}{12}$	16800	16245,60
Bes,	192	$\frac{2}{3}$	19200	18566,40
Dodrans,	216	$\frac{3}{4}$	21600	20887,20
Dextans,	240	$\frac{5}{6}$	24000	23208.
Deunx,	264	$\frac{11}{12}$	26400	25528,80
Jugerum,	288		28800	27849,60

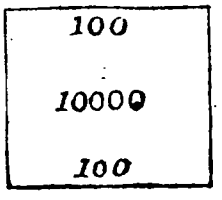
CHAP.

CHAP. II.

Of the ſeveral Forms of Lands, and of their Dimenſions (1).

ALL land is either ſquare, or long, or ſhaped like a wedge, or triangular, or round, or exhibits the form of a ſemicircle, or of an arch of a circle, and ſometimes alſo of ſeveral angles. The meaſuring of a ſquare is very eaſy; for, ſeeing it is of the like number of feet on all ſides, two ſides are multiplied into one another; and what ſum ariſes from the multiplication, that we call the number of ſquare feet contained in it. As, if a place were an hundred feet every way, we multiply one hundred into a hundred, and they make ten thouſand: therefore we will ſay, that that place has ten thouſand ſquare feet, which make a third part, and a two-and-ſeventieth part of a *jugerum*; according to which proportion, we muſt make the computation and payment of any work done.

The form of land



that is ſquare.

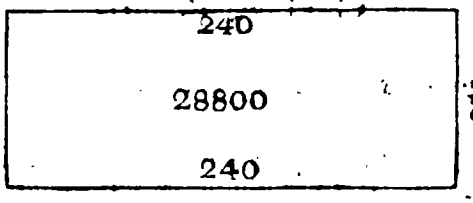
But if it be longer than it is broad, as for example, let the form of the *jugerum* have CCXL feet in length, and CXX in breadth, as I ſaid a little before; you ſhall multiply the feet in breadth with the feet in length thus: one hundred and twenty times two hundred and forty amount to twenty-eight thouſand and eight hundred. We ſhall ſay, that a *jugerum* of land contains ſo many feet ſquare. You ſhall pro-

(1) In the old editions of this author, theſe different figures of land, as here placed, are not to be found; only the *Roman* numeral letters, correſponding to each, are ſo placed, as in ſome meaſure to repreſent each figure immediately treated of, and they are printed as a part of the text: but whether the author deſigned any figures at firſt, is very uncertain; yet it ſeems probable, becauſe the letters anſwering to the ſame were found in the manuſcripts, according to which the firſt editions were exactly printed.

The laſt figures, which repreſent the different diſtances to be obſerved in planting trees, ſignify very little, becauſe, for want of room, they cannot be made to anſwer in number to the ſeveral diſtances mentioned by the author: notwithſtanding I have added a few of them, becauſe they are printed in ſome of the beſt editions; and they ſerve to illuſtrate the thing a little, if any one will obſerve the proportions of the numbers.

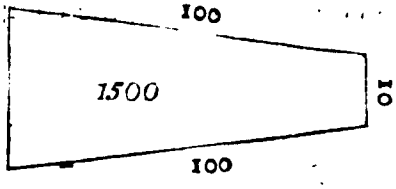
ceed

ceed in like manner with all lands whoſe length is greater than their breadth.

The form of a 

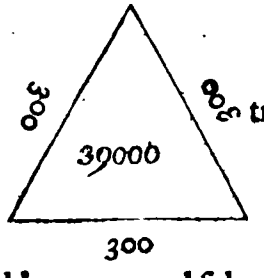
$\frac{1}{2}$ *jugerum* of land.

But if the land be in the form of a wedge, ſuppoſe it be one hundred feet long, and twenty feet broad on one part; and on the other, ten feet: then we will add together the two breadths, and both ſums will make thirty feet. The half of this ſum is fifteen, by multiplying which with the length, we will make one thouſand five hundred feet. We ſhall therefore ſay, that in this wedge, theſe are the ſquare feet which will make one half ounce and three ſcruples, that is, $\frac{1}{24}$ part, and $\frac{3}{288}$ parts of a *jugerum*.

The form of land in 

the ſhape of a wedge.

But if you are to meaſure a triangle with three equal ſides, you ſhall follow this method. Let the land be triangular, of three hundred feet every way: multiply this number into itſelf, it will make ninety thouſand feet: take the third part of this ſum, *viz.* thirty thouſand. Take alſo the tenth part, *viz.* nine thouſand. Add both ſums together, they make thirty-nine thouſand. We'll ſay, that this is the ſum of the ſquare feet in this triangle; which meaſure makes one *jugerum*, and one third of a *jugerum*, and the forty-eighth part of a *jugerum*.

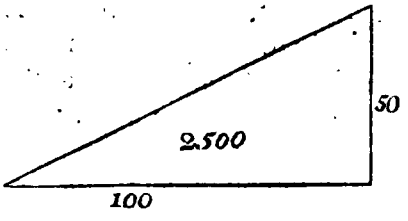
The form of equilateral 

triangular land.

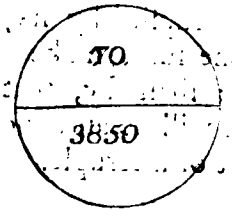
But if the triangular land have unequal ſides, as in the figure ſubjoined, which has a right angle, the computation ſhall be ordered and made in a different manner. Let the line of the one ſide, which makes the right angle, be fifty feet; and of the other, one hundred feet. Multiply

theſe two ſums into one another. Fifty times one hundred make five thouſand; the half of theſe make two thouſand five hundred, which part makes an ounce and a ſcruple, or $\frac{1}{12}$ part, and $\frac{1}{288}$ part of a *jugerum*.

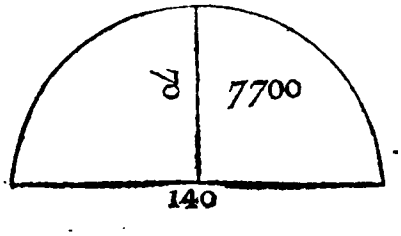
The figure of a triangular field, with one right angle.



If the land ſhall be round, ſo as to have the apppearance of a circle, take the feet thus: Let there be a round area, whoſe diameter contains LXX feet. Multiply this into itſelf; ſeventy times ſeventy make four thouſand nine hundred: multiply this ſum by eleven, they make fifty-three thouſand nine hundred feet. I ſubſtract the fourteenth part of this ſum, *viz.* three thouſand eight hundred and fifty feet. Theſe, I ſay, are the ſquare feet in this circle, which make an ounce and an half, and $\frac{1}{2}$ ſcruples of a *jugerum*.

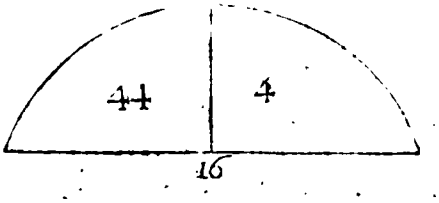
The form of  round land.

If the land be ſemicircular, whoſe baſis has CXL feet, and the breadth of the curvature LXX feet, you muſt multiply the breadth with the baſis: ſeventy times one hundred and forty make nine thouſand and eight hundred: theſe multiplied by eleven make one hundred and ſeven thouſand and eight hundred. The fourteenth part of this ſum makes ſeven thouſand and ſeven hundred. We ſhall ſay, that theſe are the number of feet in this ſemicircle, which make three ounces and five ſcruples, *i. e.* $\frac{1}{4}$ part, and $\frac{5}{288}$ parts of a *jugerum*.

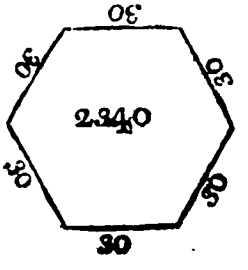


But,

But, if it be leſs than a ſemicircle, we will meaſure the arch after this manner: Let there be an arch, whoſe baſis contains XVI feet, and the breadth IIII feet. I add the breadth to the baſe: both make XX feet. Theſe I multiply by four, and they make LXXX feet: the half of theſe is XL. Alſo the half of ſixteen feet, which make the baſis, is VIII: theſe VIII, multiplied into themſelves, make LXIV: from theſe I take a fourteenth part, which makes IIII feet, and a little more. This you ſhall add to forty: both ſums make XLIIII. I ſay, that theſe are the ſquare feet in that arch, which make half a ſcruple, *i. e.* $\frac{1}{576}$ part of a *jugerum*, leſs a twenty-fifth part of a ſcruple.



If the land has ſix angles, it is reduced into ſquare feet thus: Let there be an hexagon, with lines of XXX feet every way. I multiply one ſide into itſelf; thirty times thirty make DCCCC. Of this ſum I take a third part, CCC, and a tenth part of the ſame, XC, which make CCCXC. This muſt be multiplied by ſix, becauſe there are ſix ſides, which, being reduced to one ſum, make two thouſand three hundred and forty. Therefore we ſhall ſay, that there are ſo many ſquare feet therein. Therefore it will be an ounce of a *jugerum*, leſs half a ſcruple, and the tenth part of a ſcruple.

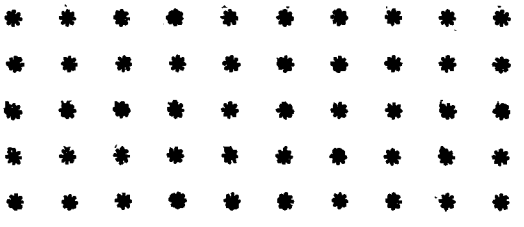


CHAP.

CHAP. III.

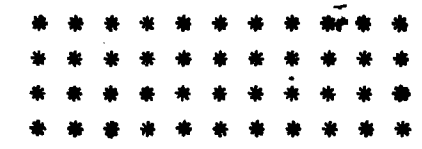
How many Plants a Jugerum *of Land may receive, when they are ſet at the Diſtance of Three Feet, and from that to the Diſtance of Ten Feet from each other.*

HAVING therefore attained to a right perception of theſe firſt principles, as it were, of ſuch-like computation, we ſhall, without any difficulty, enter upon the meaſuring of lands, of which it is both tedious and difficult to proſecute and treat of all the different ſorts. I ſhall alſo now add to theſe I have already propoſed two different formulas or methods, which Huſbandmen frequently make uſe of in the diſpoſition and ſetting of their plants. Let there be a field one thouſand two hundred feet long, and one hundred and twenty feet broad: in it the vines muſt be ſo diſpoſed, that five feet be left between the rows. I aſk, how many plants there ſhall be occaſion for, when ſpaces of five feet are required between the plants? I take a fifth part of the length, which makes CCXL, and a fifth part of the breadth, which makes XXIIII. To both theſe ſums I always add one, which make the outmoſt rows, which they call the angular rows: therefore one ſum is two hundred and forty-one, and the other twenty-five. Multiply theſe ſums thus: Twenty-five times two hundred and forty-one make ſix thouſand and twenty-five. You ſhall ſay, that juſt ſo many plants will be wanted.



Likewiſe, if you have a mind to ſet them at the diſtance of ſix feet the one from the other, you ſhall ſubtract the ſixth part of the length of one thouſand two hundred, which make CC; and the ſixth part of CXX, the breadth, which makes XX. To each of theſe ſums you ſhall add one, which I called the angular rows; they make CCI and XXI. You ſhall multiply theſe ſums into one another, *viz.* twenty-one times two hundred and one; and ſo you ſhall make four thouſand two hun-

dred and twenty-one. You ſhall ſay, that there will be occaſion for the like number of plants.



In like manner, if you would plant them at the diſtance of ſeven feet, you ſhall take the ſeventh part of the length and breadth, and add one for the angular rows, in the ſame manner, and in the ſame order, you ſhall complete and make up the full number of plants. Laſtly, at how many feet diſtance ſoever you ſhall judge proper to make the rows, you ſhall take ſuch a part of the length and breadth, and add the foreſaid units for the corner ranks.

Seeing theſe things are ſo, it follows, that a *jugerum* of land, which has CCXL feet in length, and CXX in breadth, may receive, at the diſtance of three feet, (for we think, that this is the leaſt diſtance that we ought to make in planting vines) in length LXXXI, and in breadth, at the diſtance of five feet, XXV plants; which numbers, being multiplied into one another, make two thouſand and twenty-five plants.

Or, if the vineyard be planted at the diſtance of four feet every way between each plant, the row will have LXI plants in length, and XXXI in breadth; which numbers make one thouſand eight hundred and ninety-one vines in a *jugerum*.

Or, if the vineyard be ſo laid out, as to have the diſtance of four feet between the vines in the length, and of five feet in the breadth, the row will have LXI plants in length, and XXV in breadth. But, if they be planted at the diſtance of five feet the one from the other, the row will contain XLIX plants lengthways, and XXV plants in breadth; which two numbers, multiplied into one another, make one thouſand two hundred and twenty-five.

But, if you ſhall think fit to lay out the ſame place in rows of vines at the diſtance of ſix feet, there is no doubt but XLI vines muſt be aſſigned to the length, and XXI to the breadth; which, being multiplied into one another, make DCCCLXI. But, if the vineyard muſt be laid out into diſtances of ſeven feet, the row in length will receive thirty-five heads, and in breadth XVIII; which numbers, multiplied into one another, make DCXXX. We ſhall ſay, that juſt ſo many plants muſt be prepared. But, if the vineyard ſhould be planted at the diſtance of eight feet, the row in length will receive XXXI plants, and

in

in breadth XVI; which numbers, multiplied into one another, make CCCCXCVI. But, if at the diſtance of nine feet, the row in length will receive twenty-ſeven plants, and in breadth fourteen: theſe numbers, multiplied into one another, make CCCLXXVIII. But, if at the diſtance of ten feet, the row in length will receive XXV plants, and in breadth XIII: theſe numbers, multiplied into one another, make CCCXXV.

And, that our diſcourſe on this ſubject may not proceed *in infinitum*, we may ſet our plants in the ſame proportion, according as every one ſhall be pleaſed with wider ſpaces. Let what we have ſaid of the meaſures of lands, and of the numbers of plants, ſuffice. Now I return to the order I propoſed.

CHAP. IV.

Of the Culture of provincial Vineyards.

I Have found, that there are ſeveral kinds of provincial vines; but of thoſe that I myſelf have known, ſuch as ſtand by themſelves, with a ſhorter leg or ſtock, like little trees, without any prop to ſupport them, are moſt approved. Next are thoſe, which, leaning upon props, are placed upon ſingle frames. Theſe the Peaſants call *under-propped* or *horſed vines* (1). And then ſuch as, being fenced all round with reeds fixed in the ground, and their firm-wood branches tied to the ſeveral reeds that ſupport them, are bended all round into an orbicular form. Theſe ſome call *paliſaded vines*. Vines, that lie flat upon the ground, are in leaſt eſteem, which, being, as it were, preſently projected from the ſtem when it ſprings out of the earth, are ſpread and ſtretched out at their full length upon the ground.

The way and method of planting all theſe is almoſt the ſame; for the plants are ſet either in a trench, or in a furrow, becauſe the Huſbandmen in foreign nations are unacquainted with paſtinating the ground; which indeed is almoſt ſuperfluous, and of no uſe, in thoſe places,

(1) *Canteriatas vites.* Vines, ſupported by ſingle frames or yokes, were ſo called by the Peaſants. *Canterius* or *cantherius* ſignifies a gelding; and the word was frequently made uſe of by the *Romans* to ſignify any thing that ſupported another, as the word *horſe* in *Engliſh* is applied to ſeveral things in the ſame ſenſe. Our author ſays, *lib.* iv. *c.* 12. that, to each vine, he applied two reeds, or faſtened old ſpear-ſtaves hard by them, to which he applied one tranſverſe pole towards the lower part of the row, upon which the vine might ſpread itſelf rather in breadth than in length and height; and theſe kinds of ſingle frames they called *canterii* (*horſes*), to diſtinguiſh them from the *juga* or double frames.

where the ſoil is looſe and open, and crumbles into duſt of itſelf: *for this we imitate in plowing*, as *Virgil* (2) ſays, which we do alſo in paſtinating the ground. Therefore the people of *Campania*, tho' they might take example from us, who live very near them, don't follow this method of working the ground, becauſe the eaſineſs of that ſoil requires leſs labour; but where-ever a cloſer and thicker land in the province obliges the Huſbandman to a greater expence, what we effectuate by paſtinating, he obtains by making a furrow, that he may ſet his plants in ground that is more looſened and opened.

CHAP. V.

A Repetition of thoſe Things, which have been mentioned by their ſeveral Kinds.

BUT, that I may diſcourſe particularly of each of thoſe kinds of vines I have propoſed, I ſhall reſume the order before-mentioned. The vine, which ſtands by its own ſtrength, without a prop, where the earth is more looſe and open, muſt be planted in a foſs or trench; but, when it is denſer and cloſer, in a furrow. But it will be a very great advantage, if, in temperate places, where the ſummer is not exceeding hot, both the trenches and the furrows be made a year before the vineyards are planted. Nevertheleſs the goodneſs of the ſoil muſt be carefully inquired into; for, if the plants be ſet in hungry and poor land, the trench or furrow muſt be made about the very time of planting them. If they are made a year before, it is abundantly enough if the trench be digged three feet both in length and in depth; nevertheleſs it muſt be two feet in breadth. Or, if we deſign to leave ſpaces of four feet between the rows, we reckon it more convenient to allow the ſame meaſure to the trenches on every ſide; nevertheleſs not to ſink them more than three feet deep. But the plants muſt be applied to the four corners, after ſmall earth has been put under them, and ſo the trenches muſt be filled up.

But, as to the ſpaces between the rows, we have only this direction to give, that Huſbandmen ſhould underſtand, that, if they deſign to cultivate their vineyards with the plough, they muſt leave wider ſpaces between the rows; or, if they deſign to cultivate them with hoes or

(2) *Virg. georg.* ii. 184.

ſpades,

ſpades, they muſt leave them narrower: but they muſt neither be wider than ten feet, nor narrower than four. Nevertheleſs many lay out the rows ſo as to leave all along the ſtraight line two feet, or, as is commonly done, three feet between the plants. But, on the other hand, they make the tranſverſe ſpaces wider, through which either the Digger or the Plower may freely paſs.

But the care of planting ought not to be different from what I directed in the third book. Nevertheleſs *Mago* the *Carthaginian* adds one thing to this ſort of planting, *viz.* that the plants be ſo ſet, that the whole trench may not be immediately filled up with earth; but that the following two years almoſt the one half of it be gradually filled up; for thus, he thinks, the vine will be forced to ſtrike its roots downward. I ſhall not deny, but this may be done with advantage in dry places; but where either the country is ouſy and wet, or the conſtitution of the climate is rainy, I am of opinion it ought not at all to be done; for too much moiſture, remaining in the trenches, that are half filled up, kills the plants, before they recover ſtrength: wherefore I think it more advantageous, that the trenches be filled up again after the plants are ſet in them; but that, after they have taken root, they ought to be carefully ablaqueated to a conſiderable depth preſently after the autumnal Equinox; and, after cutting away the ſmall roots, if they have put forth any towards the ſurface of the ground, to be filled up again after a few days; for thus both thoſe inconveniencies will be avoided, that neither their roots will be drawn up to the upper part, nor the plants, which are not very ſtrong, be vexed with immoderate rains. But, where they are already grown ſtrong, there is no doubt but they receive great benefit from rain-water: therefore, in places where the clemency of the winter allows it, it will be proper to leave the vines uncovered, and to keep them ablaqueated the whole winter.

But, concerning the quality of vine-plants, authors are not agreed among themſelves. Some of them think it beſt, that a vineyard be planted at the very firſt with cuttings; others, with quickſets. Concerning which thing, I have already declared what I think, in the preceding books. Nevertheleſs I now add this farther, that there are ſome lands, in which plants, that are tranſplanted, do not anſwer equally well as thoſe, which have not been moved; but that that happens very rarely. Therefore we muſt obſerve, and diligently endeavour to find out,

'What ev'ry ſoil will bear, and what refuſe (1).'

(1) *Virg. georg.* i. 53.

Therefore

Therefore it is proper, when the plant is ſet in the ground, whether it be a cutting or a quickſet, to form it in ſuch a manner, that the vine may ſtand without a prop. But this cannot be done preſently; for, unleſs you apply a ſupport to the vine while it is tender and infirm, the young branch, creeping forth, will bend towards, and lean upon, the earth. Therefore a reed is tied to the plant when it is firſt ſet, which may defend, as it were, its infancy, and educate it, and carry it up to ſuch a ſtature as the Huſbandman allows. Moreover, that ought not to be very high; for you muſt check it, and keep it under, even ſo far as one foot and an half. Afterwards, when it gets ſtrength, and is now able to ſtand without help, it grows up to its perfect ſtate, by the growth either of its head, or of its arms; for of this culture alſo there are two ſorts: ſome approve more of vines cut cloſe to the head; others of thoſe that have arms.

It is proper, that they, who take pleaſure to trim and form the vine into arms, ſhould preſerve whatever ſprouts forth hard by the ſcar, where the young vine has had its upper part cut off, and divide it into four arms of the length of one foot, ſo that each of them may look to a different quarter of the heavens. But theſe arms are not preſently to be put upon ſhooting forth in length the firſt year, leſt the vine be burdened during its weak and ſlender condition; but they are drawn out to the foreſaid length by a great many prunings. Then there muſt be left, as it were, certain horns ſticking out of the arms, and ſo the whole vine be diffuſed into a circular form on every ſide. But the method of pruning is the ſame as in vines that grow upon frames; nevertheleſs it differs in one thing, that, inſtead of longer firm-wood branches, there are left thumbs of four or five eyes: but for keepers there are made ſhort-cut branches of two eyes.

Then, in that ſort of vine, which, we ſaid, was formed into a head, the ſpray is pulled off cloſe by the body of its mother, one or two eyes only being left, which adhere to the ſtock itſelf; and this can be ſafely done in places that are well watered, or that are very fat, when the ſtrength of the earth is able to afford both fruit and firm-wood. But they, who have their vineyards formed after this manner, cultivate them chiefly with ploughs; and they follow this method of pulling off the arms from the vines, becauſe the heads themſelves, having nothing ſticking out of them, are neither obnoxious to the plough, nor to the oxen; for, in ſuch vines as have arms, it happens, for the moſt part, that their ſmall branches are broken either with the legs or horns of the oxen, and often alſo with the tail of the plough, while the diligent plowman endeavours lightly to touch or graze upon the rows with the

the plough-ſhare, and to cultivate that very part, which lies next to the vines. And this indeed is the culture that is beſtowed either upon vines with arms, or upon thoſe that are cut cloſe to the head, before they put forth their buds. Then, after they have put forth their buds, the Digger follows the Ploughman, and, with hoes, breaks up and manures thoſe parts, which he could not reach.

Preſently after the vine has put forth its firm-wood branches, follows the perſon who lops off all the luxuriant parts, and clears it of all the ſuperfluous young branches, and ſets apart for growth ſuch as are fruitful, which, after they are hardened and become firm, are bound up in the manner of a crown. This is done for two reaſons; one, leſt the young branches, being left at liberty to run out in length, ſhould creep and ſhoot out, ſo as to become luxuriant, and conſume all the nouriſhment of the vine; the other is, that the vine, being bound up, may give free acceſs again to the Ploughman and the Digger, when they cultivate it. But this ſhall be the manner of pampinating or pulling off its ſuperfluous leaves and twigs, that, in places not expoſed to the ſun, and that are moiſt and cold, the vine be ſtripped naked in ſummer, and that the leaves be plucked off its branches, that the fruit may come to maturity, and that it may not rot, by becoming mouldy with too much moiſture; but, in places that are dry and warm, and expoſed to the ſun, that, on the contrary, the cluſters of grapes be covered with the ſhoots and leaves; and, if the vine be but thin of ſhoots and leaves, that the fruit be ſecured and defended with branches and leaves brought to them from other places for that purpoſe, and ſometimes with ſtraw. Indeed *M. Columella*, my uncle, a man learned in all the illuſtrious arts and ſciences, and the moſt diligent Huſbandman in the province of *Bætica*, did, about the riſing of the Dog-ſtar, make ſhades for his vines with palm-mats, becauſe, for the moſt part, during the time of the ſaid ſtar, certain parts of that country are ſo infeſted with the eaſt wind, which the inhabitants call *Vulturnus* (2), that, unleſs the vines be overſhadowed with coverings, the fruit will be burnt up, as it were, with a firy vapour.

And this is the culture both of the vine that is cut cloſe to the head, and of that which has arms; for that, which is placed upon one ſingle frame, or which is reduced into a circular form, by having its firm-wood branches, which are ſet apart for growth and for fruit, bound to props of reeds ſet round it, requires almoſt the ſame care, as that upon

(2) *Vulturnus.* The ſouth-eaſt wind was ſo called by the *Romans*, as ſome ſay, from a mountain of that name in *Apulia*, or from a town of the ſame name, which lay eaſt from *Rome*.

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the double frame. Nevertheleſs I have obſerved, that ſome perſons have taken long fruit-bearing branches of ſuch vines as are paliſaded, or ſurrounded and ſupported with reeds, eſpecially of the *Elvenacian* kind, and put them under ground near the ſurface, as if they were layers; and then raiſed them up again, and fixed them to the reeds, and ſet them apart for bearing fruit. Theſe our Huſbandmen call *mergos* (divers or offſets) (3). The *Gauls* call them *candoſoccos* (4); and they put them under-ground for one ſingle reaſon, becauſe they think, that the earth gives more nouriſhment to the fruit-bearing rods: therefore, after the vintage, they cut them off, and remove them from the ſtem as uſeleſs ſprays. But we direct, that theſe very rods, when they are cut off from the mother-vine, be planted for quickſets, if there be vacant places any-where in the rows, by the death of any of the vines, or if any perſon have a mind to inſtitute a new vineyard; becauſe the parts of the branches, which were put under-ground, have certainly a ſufficient number of roots, which, being ſet in trenches, will preſently take hold.

That other culture of the vine, that lies flat upon the ground, remains yet to be ſpoken to, which ought not to be put in practice, but where the conſtitution of the climate is exceeding ſtormy and boiſterous; for it both occaſions hard and difficult labour to the Huſbandman, nor does it ever yield wine of a generous taſte. But where the condition of the country admits only of this culture, the cutting is ſet in trenches two feet deep, which, after it ſhoots, and has put forth its buds, is reduced to one firm-wood branch; and this is kept under and reſtrained to two eyes the firſt year. Then, the following year, when it has put forth young fruit-bearing branches in abundance, one of them is ſet apart for bearing fruit, and the reſt are ſtruck off; but that which is ſet

(3) *Mergus* is a name given to ſome ſea-birds, which dive into the water, and riſe up again at ſome diſtance from the place where they plunged; for which reaſon, branches of vines, which are bended downwards from the mother-vine, and ſet into the ground, and their tops raiſed up again at ſome diſtance, are called *mergi*, or *divers*. There is a difference between this and what they call *propago*, which properly ſignifies a *layer*, and is bended downwards from the mother in the ſame manner; for *this* is in order to propagate the vine; but *that* is put under-ground to contribute to the increaſe of the fruit, and is of no further uſe, as we learn from the text.

(4) *Candoſocco*. Whether this word is compoſed of *candidus* and *ſuccus*, is not certain. Perhaps the juice of the grapes of this ſort of vine was whiter than that of others. It ſeems to be a provincial word, not pure *Latin*. The branches of theſe very low vines were bended, and put under-ground, and then the tops of them were erected, and joined to the reed, in order to produce fruit. The vine-dreſſers thought, that the curvature drew nouriſhment from the earth, and ſo had a double portion of nouriſhment, both from its own ſtock, and alſo from the earth; and then, after it had produced its fruit, they cut it off as an uſeleſs ſpray.

apart

apart for fruit, after it has brought forth its fruit, is pruned to ſuch a length, that, when lying upon the ground, it may not reach beyond the vacant ſpace between the rows. Nor is there any great difference in the pruning of a vine that lies upon the ground, and of that which ſtands upright, except that the firm-wood branches of the vine, which lies upon the ground, which are reſerved and ſet apart for growth, and bearing of fruit, ought to be ſhorter; and the ſhort cuts alſo ought to be left ſhorter, in the manner of knobs. But, after pruning, which indeed muſt always be done in autumn in a vineyard of this ſort, let the whole vine be turned over into the other vacant middle ſpace between the rows; and ſo that part, which it took up before, is either delved or plowed; and, after it is completely cultivated, it receives the ſame vine, that the other part may be cultivated alſo. Authors are little agreed about pampinating or pulling off the ſuperfluous twigs and leaves of ſuch a vineyard. Some deny that the vine ought to be made bare, that it may hide and protect its fruit the better againſt the injury of the winds and wild beaſts. Others are of opinion, that it ought to be pampinated more ſparingly, that both the vine may not be wholly burdened with ſuperfluous leaves, and yet may be able to cover and protect its fruit: which method appears more proper and commodious to me alſo.

CHAP. VI.

Of making Groves and Plantations of Elms.

BUT we have ſaid enough of vineyards at preſent. Now we muſt give directions concerning trees. Whoever ſhall have a mind to have a thick and profitable plantation of trees for ſupporting vines (1), regularly

(1) *Arbuſtum.* It was formerly, and is ſtill the cuſtom in many parts of *Italy* to plant trees in the fields for ſupporting vines; and, by this means, the vines are carried up to a great height, and ſo produce a vaſt quantity of fruit. This kind of plantation the ruſtic writers call *arbuſtum*, which cannot be rendered by any one *Engliſh* word I know, ſo as to raiſe in the mind the whole idea they intended to expreſs by it. There was the *arbuſtum Italicum*, which conſiſted of tall trees; and the *arbuſtum Gallicum*, of low or dwarf trees; both which our author deſcribes with great elegancy, and gives directions how to manage both the tree, and the vine which is married to it; and, in moſt of his deſcriptions, makes uſe of ſo many figures of ſpeech, varying his expreſſions ſo frequently, and embelliſhing the whole with borrowed words and phraſes, that it would appear ſtrange to expreſs always literally what he ſays in any modern language; ſo that it is not very eaſy, without uſing more words than one would chuſe, to expreſs his meaning fully and diſtinctly. Both in this chapter, and in many other places, he makes uſe of a variety of words, which properly belong

regularly diſpoſed at equal diſtances the one tree from the other, muſt take care, that it don't grow thin by the trees decaying and dying; and let him remove the very firſt that is afflicted either with old age or boiſterous weather, and ſubſtitute a new plant in its room; and this he may eaſily obtain, if he have a nurſery of elms ready at hand. How, and in what manner, and of what kind of trees, it muſt be made, I ſhall not grudge the trouble to give directions each in its order.

It is agreed, that there are two ſorts of elms, the *Gallic*, and that which is a native of our own country; that is called the *Atinian* (2), and this our own *Italian elm*. *Tremellius Scrofa* was miſtaken, when he thought, that the *Atinian* elm did not bear ſeed; for, without doubt, it produces it but very thin, and in a very ſmall quantity, and therefore ſeems barren to moſt people, the ſeeds lurking among the leaves, which it puts forth at its firſt budding: therefore nobody now plants it from the ſeed, but from the ſhoots, which ſprout out of the root or ſtock of the tree. But this elm thrives much better, and is much taller, than our *Italian* elm; and yields a ſweeter leaf, and more agreeable to oxen; which if you feed cattle conſtantly with, and afterwards begin to give them leaves of that other kind, it makes the oxen nauſeate their food. Therefore, if it can be done, we will plant all our land with this one kind of the *Atinian* elm; but, if this cannot be done, we will take care, in laying out our rows, to plant an equal number of our own

belong to other things, as *pes vitis*, the foot or root of the vine; *crus vitis*, the leg or trunk; *brachia*, the arms or boughs; *caput vitis*, the head of the vine: ſo he calls that part where it begins firſt to ſpread and extend itſelf. The Vine-dreſſers commonly form it as they pleaſe; for, when the top of a young vine is amputated, it ſends forth ſeveral ſhoots, two or more of which the Vine-dreſſer chuſes, and ſets apart for growth, in order to produce fruit. The larger branches or boughs are called the *arms* of the vine. Out of theſe ſpring other branches, which, becauſe of the ſeveral ſmall twigs which ſhoot out of their ſides, reſembling ſo many fingers of a man's hand, are called *palmites*. Theſe I call *fruit-bearing branches*, becauſe on theſe more immediately the fruit of the vine grows; for out of them ſpring the twigs, or young ſhoots, upon which the grapes grow. Theſe *palmites* are cut longer or ſhorter, as the Vine-dreſſer pleaſes, reſerving more or fewer eyes upon them, according to the ſtrength of the vine. We muſt obſerve, that, at pruning, the wood or ſpray, upon which the laſt year's fruit grew, is always cut away; for the twig, which immediately bears the fruit, is ſtill of the ſame year's growth. The branches (*palmites*) of the vine, as alſo the ſhoots that grow out of the different parts of it, have different appellations, according to their figure, or the uſe they are applied to, or the place of the vine where they grow. Sometimes they are called *cuſtodes*, keepers; ſometimes *præfidiarii* or *ſubſidiarii*, branches of reſerve, or ſubſidiary branches; ſometimes *pollices*, from the figure they make when they are cut not too cloſe, but at a certain diſtance from the part out of which they grow, reſembling the thumb of one's hand; ſometimes they are called *reſeces*, which may be tranſlated ſhort-cut ſhoots, as has been obſerved in another place.

(2) *Atinia ulmus*, the *Atinian* elm, ſo called from *Atina*, a town in *Gallia Ciſpadana*, that part of *Gaul* which lay on the ſouth ſide of the *Po*, of which *Pliny* ſpeaks, *nat. hiſt. lib.* iii. *c.* 19.

Italian,

Italian, and of *Atinian* elms alternately: ſo we ſhall always make uſe of mixt leaves; and the cattle, being allured by this ſeaſoning, as it were, will more eagerly eat up that due quantity of food, which is allotted them.

But the poplar-tree ſeems to nouriſh the vine moſt of any; next to that, the elm; and, after that, the aſh-tree alſo. The poplar-tree (3) is rejected by moſt people, becauſe it yields a thin leaf, and not proper for cattle. The aſh-tree, which is moſt acceptable to goats and ſheep, and not uſeleſs for oxen, is rightly planted in rough, rugged, and mountainous places, where the elm thrives but indifferently. The elm is preferred by moſt people, becauſe it both ſuffers the vine without any inconveniency to it, and yields a moſt agreeable fodder for oxen, and comes up and thrives very well in various kinds of ſoils. Therefore let him, who has a mind to plant a great number of trees for ſupporting vines, prepare nurſeries of elms and aſhes in that manner I have hereafter deſcribed; for poplars are better planted at firſt in tops, in the ground you deſign they ſhould grow in: therefore we will paſtinate the earth with the hoe or trenching-ſpade, which is two feet deep, where the ſoil is fat, and moderately moiſt; and, after it has been carefully harrowed, and all the clods broken, form it into even beds or diviſions in the ſpring-time. Then we will throw the ſeed upon the beds, which will now be of a reddiſh colour, and ſhall have lain expoſed to the ſun for ſeveral days, yet ſo as ſtill to retain ſome moiſture and clammineſs in it; and we will cover the beds thick all over with the ſeeds, and ſo, with a ſieve, ſift looſe crumbling earth two inches deep upon them, and water them moderately, and cover the beds with ſtraw, leſt the fowls gnaw the tops of the plants when they are coming forth, and appearing above-ground. Then, after the plants have creeped forth, we will gather up the ſtraw, and pluck up the weeds with our hands; and this muſt be done gently and carefully, leſt the ſmall roots of the elms, which are as yet tender and ſhort, be plucked up with them.

As for the beds themſelves, we muſt, by all means, make them ſo narrow, that they, who are about to weed them, may eaſily reach to

(3) *Opulus.* Authors cannot agree about this tree, ſome doubting whether there is any ſuch tree at preſent as the author here means; and they cannot fix upon a modern name for it. But as *Pliny* ſeveral times mentions the *populus* as proper, among other trees, for ſupporting vines, without mentioning the *opulus*, I think it more reaſonable to tranſfer *populus* from *Pliny* to *Columella*, than to pretend to correct *Pliny* by *Columella*, eſpecially conſidering, that, at preſent, the poplar-tree is uſed about *Bologna*, and many other places on the ſouth of the *Po*, for ſupporting vines. Accordingly I have taken the liberty always to tranſlate it a poplar-tree, tho' the text has always *opulus*. A ſingle letter might eaſily be cut off from the beginning of the word, and the other word become the common reading.

the middle of them with their hand; for, if they be broader, ſuch of the plants themſelves, as ſhall be trodden down, will ſuffer damage. Then, in the ſummer, before the ſun riſes, or towards the evening, the nurſeries ought rather to be ſprinkled than watered; and, when the plants are about three feet high, they ought to be tranſplanted into another nurſery; and, that they may not ſtrike their roots too deep, (which afterwards occaſions great labour in taking them out of the ground again, when we have a mind to tranſplant them into another nurſery) we muſt dig the trenches, not of the largeſt ſize, at the diſtance of one foot and an half the one from the other. Then the roots muſt be twiſted into a knot, if they be ſhort, or, if they be longer, into a circle, in the manner of a crown; and, after they are ſmeared over with cow's dung, be ſet into the little trenches, and the ground carefully trodden down all round them. The plants alſo, that are gathered and taken from the roots and ſtocks of the tree, may be ſet in the ſame manner; which muſt of neceſſity be done in the *Atinian* elm, which is not raiſed from the ſeed. But this elm is better planted in autumn than in the ſpring: and its ſmall branches muſt be wreathed or twiſted by little and little with the hand, becauſe the firſt two years it greatly dreads the ſtroke of an iron tool. At length, the third year, it muſt be lopped bare with a ſharp pruning-knife. And now, when it is fit for being tranſplanted, the proper ſeaſon for planting it is from that time of autumn, when the earth ſhall have been throughly moiſtened with ſhowers, till the ſpring of the year, before the root of the elm be in danger of having its bark pulled off in taking it out of the ground. Therefore, in looſe earth, the trenches muſt be made three feet every way; but, in that which is denſe, furrows of the ſame depth muſt be prepared for receiving the trees. But then, in a dewy and foggy ſoil, the elms muſt be ſo planted, that their branches may be directed towards the eaſt and the weſt, that the middle of the trees, to which the vine is applied and faſtened, and upon which it leans, may receive the more ſun.

But, if we have corn alſo in our view, and provide for it accordingly, let the trees be diſpoſed and ſet within forty feet of each other, in a fertile and rich ſoil; and, in that which is poor and lean, within twenty feet. Then afterwards, when they begin to grow up to their full ſtature, they muſt be formed with the pruning-knife, and laid out into *ſtories* or *diviſions*; for by this name Huſbandmen call the prominent branches and trunks, and they either lop them cloſer, and reſtrain them within narrower bounds, with the knife, or let them ſhoot out to a greater length, that the vines may be ſpread the wider, and lie more diffuſe upon them. *This* is beſt in a fat ſoil, and *that* in a ſlender and poor one. Let not the ſtories be leſs than three feet diſtant from each

other, and let them be ſo formed, that the upper branch be not in the ſame line with the lower; for the lower branch will rub againſt, and bruiſe the fruit-bearing vine-branch, which is let down from that, when it is budding, and will ſtrike off its fruit.

But, whatever tree you ſhall plant, you muſt not prune it the next two years. Then afterwards, if the elm receives but very little growth, the top of it muſt be lopped off in the ſpring-time, before it lets fall or caſts its bark, hard by the ſmall branch, which ſhall appear to be the faireſt; but this nevertheleſs muſt be ſo done, that you may leave above it a ſtump upon the trunk three-fourths of a foot long, to which the ſaid branch may be bended, applied, and bound faſt, and ſo, being turned upwards, may afford a top to the tree. Then, after one year, the ſtump muſt be cut off, and the place ſmoothed. But, if the tree have no ſmall branch fit for this purpoſe, it will be enough, that nine feet from the earth be left of it, and that the upper part be lopped off, that ſo the young rods which it ſhall put forth, may be ſecure from the injury of the cattle. But, if it can be done, the tree muſt be cut thro' with one ſtroke; but, if that cannot be done, it muſt be cut off with a ſaw, and the wound ſmoothed with a pruning-knife; and this wound muſt be covered with clay mixt with ſtraw, that it may not be annoyed by the ſun or rains. After one or two years, when the ſmall branches, which are ſprung out of it, ſhall have got ſtrength, and thrive as they ought to do, it will be proper, that thoſe which are ſuperfluous be lopped off, and that thoſe, that are fit for your purpoſe, be put upon growing in a regular manner in the row.

Whatever elm ſhall have thriven and come well forward from the time it was ſet, its uppermoſt branches ought to be freed from knots with a pruning-knife; but, if the ſmall branches be ſtrong, let them be ſo lopped off with the iron tool, that you may leave a ſmall ſtump ſticking out from the ſtock. Then, after the tree is waxen ſtrong, whatever can be touched with the pruning-hook, muſt be lopped off, and ſmoothed ſo far, as that the wound or cut may not be applied to the body of the mother. But it will be proper to ſhape a young elm in this manner: In a fat place, eight feet from the earth muſt be left of it without a branch, or, in meagre land, ſeven feet. Then, above the ſaid ſpace, the tree muſt be divided into three parts in its whole circumference; and let the ſmall branches, which muſt be ſet apart for growth on the three ſides, one to each ſide, be aſſigned to the firſt ſtory. Then, three feet above that, other branches muſt be taken, and ſet apart for growth; but ſo, that they may not be placed in the ſame line with thoſe of the former ſtory: and in the ſame manner muſt the tree be regularly adjuſted to the very top. And, in lopping the tree, care

muſt

muſt be taken, that neither the thumbs, which are left of the rods which are lopped off, be made longer than they ought to be, nor, on the other hand, that they be ſo ſmoothed, as that the trunk itſelf be hurt, or have its bark peeled off; for that elm rejoices but very little, which is ſtripped bare to the very body: and we muſt avoid making two wounds into one, ſeeing the bark will not eaſily cloſe upon, and grow over, ſuch a ſcar. But this tree requires perpetual culture, not only carefully to diſpoſe and put into due order the things before-mentioned, but alſo to dig round the ſtock, and every other year either to cut off with the knife, or bind faſt up, and reſtrain, every twig or leaf, that ſhall ſprout out of it, leſt its ſhadow, vying with that of the vine, ſhould hurt it. Then, when the tree is arrived at a conſiderable age, it muſt be wounded near where a branch grows out of it, ſo that there may be a hole made in it to the very pith, whereby there may be an outlet to the water, which it has gathered in the upper part.

It is proper alſo to plant the vine, before the tree prevails and grows altogether too ſtrong for it; but, if you marry a tender young elm, it will endure a young vine; but, if you apply an old vine to it, it will kill its huſband: ſo it is proper, that the trees and vines be equal to each other in age and ſtrength. But, in order to marry or couple the tree and the vine together, there ought to be a trench made for the quickſet two feet broad, and as many feet deep, in light earth; but, in heavy ground, two feet and three-fourths of a foot, and ſix, or at leaſt five feet long: but let this be no leſs than the ſpace of one foot and an half diſtant from the tree; for, if you join it to the roots of the elm, the vine will ſtrike root but very indifferently, and, when it has taken hold, it will be oppreſſed by the growth of the tree. Make this trench in the autumn, if your buſineſs will permit, that it may be macerated with the rains and froſts. Then, about the vernal Equinox, two vines muſt be ſet in the trenches at the diſtance of one foot from each other, that they may cloathe the elm the more quickly; and you muſt take care, that they be not planted either when the north winds blow, or when they are wet with dew, but when they are dry.

I order this particularly to be obſerved, not only in planting vines, but elms alſo, and other trees; and that, when they are taken out of the nurſery, one part of them be marked with ruddle: which may put us in mind not to place the trees otherwiſe, than in the manner they ſtood in the nurſeries; for it is of very great importance, that they look to that part of the heavens, to which they have been accuſtomed from their infancy. But, in places expoſed to the ſun, where the ſtate of the climate is neither very cold, nor too rainy, both trees and

and vines are better planted in autumn, after the Equinox; but theſe muſt be ſo planted, that we may lay under them, to the depth of half a foot, the uppermoſt earth, which has been well broken and ſubdued with the plough, and ſpread and open all their roots, and dung them after they are ſet, as I am of opinion. If not ſo, let us cover them with well-wrought earth, and tread it down round the ſtock of the plant. The vines muſt be ſet in the farthermoſt part of the trench, and their firm-wood (4) ſtretched along the trench, and erected to the tree, and fenced with rails againſt the injuries of cattle. But, in very hot places, the plants muſt be applied to the tree upon the north ſide of it; in cold places, upon the ſouth ſide; in a temperate ſtate of the climate, either upon the eaſt or weſt ſide, that they may not endure the ſun, or the ſhade, the whole day.

Then *Celſus* is of opinion, that, the next pruning-time, it is better to forbear to make uſe of the pruning-knife; but that the young branches or ſhoots themſelves be twiſted and wrapped round the tree, in the manner of a crown, that the part, that is bended, may put forth firm-wood branches, of which, the following year, we may make the ſtrongeſt the head of the vine. But long experience has taught me, that it is much better to apply the pruning-knife to vines the very firſt ſeaſon for pruning, and not to ſuffer them to grow buſhy and wild with ſuperfluous ſprays. But I am alſo of opinion, that that firm-wood branch, which ſhall be ſet apart for growth, be curbed with the pruning-knife as far as the ſecond or third eye, that ſo it may put forth the ſtronger fruit-bearing branches, which, as ſoon as they have reached to, and taken hold of the firſt ſtory of the tree, ſhall, the next pruning, be regularly diſtributed among all the branches of it: otherwiſe they ſhall be raiſed up to the uppermoſt ſtory, always leaving one firm-wood branch, which, being applied to the trunk, may look towards the top of the tree.

And now a certain law is impoſed by Huſbandmen upon the vine, when it is conſtituted and ſet in its place: moſt of them croud the lower ſtories of the tree with firm-wood branches, having only in view a greater plenty of fruit, and a more eaſy way of cultivating it. But they, who have the goodneſs of the wine chiefly at heart, advance and raiſe

(4) *Materia*. The hard firm-woody part of the vine is ſo called. Sometimes it ſignifies any ſhoot reſerved and ſet apart for growth, in order to form either an arm, or any leſſer hard branch, of the vine; and it is oppoſed to thoſe tender ſhoots, which are cut away in pruning, and are but of a ſhort duration. The *materia* is commonly the arm, bough, or hardened part of the vine, which puts forth the ſmaller branches they call *palmites*. The author orders all the old ſmall branches, on which the fruit of the laſt year did hang, to be cut off, and young ones to be ſubſtituted in their place.

the

the vine to the uppermoſt parts of the treee. As every firm-wood branch ſhall offer itſelf, ſo they extend it to every branch of the tree that is higheſt, that the uppermoſt part of the vine may follow the uppermoſt part of the tree; that is, that the two extreme fruit-bearing branches be applied to the trunk of the tree, which may look towards the top thereof; and, according as every branch of it has gathered ſtrength, it may take the burden of the vine upon itſelf. Upon branches of the tree, that are fuller and thicker, let more fruit-bearing branches of the vine be impoſed, the one ſeparate from the other, and fewer upon thoſe that are ſlenderer; and let the young tender vine be tied to the tree with three different bindings; with one in the leg of the vine towards the lower part of the tree, at the diſtance of four feet from the earth; with a ſecond, which takes hold of the vine by its uppermoſt part; and a third, which embraces the middle of the vine. The lowermoſt binding muſt not be put upon it, when it impairs the ſtrength of the vine; nevertheleſs ſometimes it is reckoned neceſſary (5), when either the tree has all its branches lopped off, or when the vine, growing too ſtrong, ſpreads itſelf beyond its bounds, and is growing luxuriant.

What is further neceſſary with reſpect to pruning, is as follows; that the old fruit-bearing branches, upon which the laſt year's fruit did hang, be all cut off, and taken away, and new ones ſet apart for bearing fruit in the room of thoſe that are lopped off, after you have pared away every-where round them the tendrils and nephews that have ſprung out of them; and, if the vine be in a very thriving condition, let the utmoſt fruit-bearing branches rather be precipitated (6) over the tops of the branches of the elm; if the vine be ſlender, thoſe that are next to the ſtock; if it be middling, then let thoſe that are in the middle be precipitated; becauſe the uppermoſt branch of the vine brings moſt fruit; that which is next to the ſtock, does leaſt exhauſt and extenuate the vine.

(5) *Torus imus neceſſarius.* There is a great variety in the readings of this ſentence, which it is needleſs to repeat. The correction made by *Geſnerus* ſeems the moſt probable, *viz. eorum imum imponi non oportet, quoniam vires viti adimit, interdum tamen neceſſarius*; but the meaning of the author is ſo evident, that there needs no alteration of his words, except warranted by good authority. His meaning is, that the lowermoſt binding is to be put upon it, when it is in order to leſſen the ſtrength of the vine; which is neceſſary when it grows too luxuriant, or when the tree is ſo lopped, that it has no branches to ſupport the vine.

(6) *Præcipitare palmitem.* To precipitate a young fruit-bearing branch, ſignifies to twiſt or writhe it gently, and turn it downwards, and bind it to the hard part of the vine. This *Cato* adviſes againſt, *cap.* 32. *caveto ne vitem præcipites*; but our author adviſes to do it, when the vine is grown higher than the tree that ſupports it, and only in the extreme branches; and ſays, that, when it is precipitated, tho' it draws leſs nouriſhment from the vine, yet it ſuperabounds in fruit. Sometimes theſe precipitated branches were tied to the tree in the hard part, and then they muſt almoſt wholly hang down; ſometimes they were tied in the tender part, and then they did hang down but a very little.

But

But it is of great advantage to the vines to unbind them every year; for they are both more conveniently freed from knots, and they are refreſhed when they are bound in another place, and they are the leſs hurt, and grow and recover ſtrength the better. And it is proper, that the fruit-bearing branches themſelves be ſo placed upon the ſeveral ſtories of the tree, that they may hang down tied from the third or fourth eye, and that they be not bound too hard, leſt the ſpray be cut with the willow. But, if the ſtory or diviſion of the tree be at ſo great a diſtance, that the firm-wood branch cannot be very conveniently brought up to it, having bound the fruit-bearing branch itſelf faſt to the vine, we will bind it again above the third eye. We direct this to be done for this reaſon, becauſe that part of the fruit-bearing branch, which is precipitated, is cloathed with fruit; but that which, being tied with a band to the vine, tends upward, affords firm-wood branches the year following.

But of the young fruit-bearing branches themſelves there are two ſorts; one which comes forth out of the hard part of the vine, which they call a *leaf-bearing ſhoot*, becauſe the firſt year, for the moſt part, it brings a leaf without fruit. The other is that which is procreated of a fruit-bearing branch of one year old, which they call a *fructuary ſhoot*, becauſe it forthwith produces fruit; of which ſort that we may always have plenty in our vineyard, the parts of the fruit-bearing branch muſt be bound as far as three eyes, that whatever is below the band may put forth firm-wood branches. Then afterwards, when the vine is grown up, and advanced in years and ſtrength, the long rods, or young branches, muſt be conveyed to every tree that is next to them; and, after two years, it is proper to cut them all off together, and to tranſmit or carry over others that are younger; for, when they grow old, they weary the vine. Sometimes alſo, when a vine cannot compaſs and take up the whole tree, it has been uſual to bend a part of it downwards, and immerge it into the earth, and to raiſe up two or three layers again to the ſame tree, that, being ſurrounded with ſeveral vines, it may be the more ſpeedily cloathed.

A *leaf-bearing ſhoot*, growing out of the hard part of a young vine, muſt not be preſerved and left upon it, unleſs it is ſprung out of a neceſſary place, that it may marry a branch that is a widower. Leaf-bearing ſhoots, that ſpring out of old vines, and in a proper place, are uſeful, and moſt of them, when they are cut to the third eye, are preſerved, and ſet apart for bearing fruit with very good ſucceſs; for the enſuing year they put forth firm-wood in abundance. But whatever leaf-bearing ſhoot, growing out of a good place of the vine, is broken,

either in the pruning or bending, ought not to be taken clean away, provided it have any eyes, becauſe the next year it will produce even a ſtronger firm-wood branch from one eye. Thoſe are called precipitated fruit-bearing branches, which, being ſprung out of rods of one year old, are made faſt with a band in the hard part of the vine. Theſe bring very much fruit; but they hurt the mother very much: therefore a fruit-bearing branch muſt not be precipitated, except from the extreme branches, or if the vine has ſurmounted the top of the tree. But if, nevertheleſs, any perſon has a mind to ſet apart for growth this kind of ſhoot for the benefit of its fruit, let him writhe or twiſt the fruit-bearing branch; then let him bind it faſt, and precipitate it; for both behind the place which you have twiſted will it put forth thriving firm-wood, and, when it is precipitated, it will attract leſs ſtrength to itſelf, altho' it may bear fruit in great abundance: but a branch that is precipitated muſt not be ſuffered to continue above one year.

There is another ſort of a young fruit-bearing branch, which ſprings out of the tender part of the vine, and, being made faſt with a band in the tender part of the vine, hangs down from it (we call it a firm-wood branch). It produces both very good fruit, and new ſhoots. And now, if, out of one head, two rods be preſerved, and ſet apart for fruit, neverthelefs both of them are termed *young firm-wood*; for I have above taught you what ſtrength a leaf-bearing ſhoot growing out of the ſtock of the vine has. The *chops-ſhoot* (7) is that which ſprings out of the middle, between two arms of the vine, as it were, in a fork. I have found by experience, that this is the very worſt ſhoot of all, becauſe it does not bear fruit, and weakens both the arms of the vine, between which it is ſprung up; therefore it muſt be taken away.

Moſt people have falſly believed, that a ſtrong and luxuriant vine would become more fertile, if it were loaded with many young branches, ſet apart for growth, and bearing of fruit; for the more rods it has, the more leaf-bearing ſhoots it produces; and, when it has covered itſelf with many leaves, it caſts its bloſſoms the worſe, and contains both the fogs and the dews the longer, and loſes all its grapes. Therefore my opinion is to ſeparate and divide a ſtrong vine into boughs, and to diradiate and ſpread it, by carrying its young branches to other trees, that

(7) *Palmes fœcaneus* is a young branch, that grows out in the middle between two arms of the vine, as it were, in a fork. This branch the author adviſes to cut away immediately, becauſe it weakens the vine; but, if it has already weakened one of the arms, he adviſes to preſerve it, and to ſubſtitute it in the room of that which is decayed. You may ſee why it is ſo called, *lib.* iv. *cap.* 24.

grow

grow next to it (8), and to precipitate the reſt of the fruit-bearing ſhoots; and, if it becomes too luxuriant, to leave the firm-wood branches looſe, and, by that method, make the vine more fertile. But as a thick, cloſe plantation of trees, with vines upon them, is commendable, both for its fruit, and for its beautiful appearance, ſo when, with old age, it grows thin, it is equally unprofitable, and diſagreeable to the eye. To prevent this, it is the buſineſs of a diligent Maſter of a family to remove the very firſt tree, that is decayed with old age, and to plant a young one in its place, and ſupply and fill up the vacancies of the vines, not ſo much with quickſets, (tho' he may have wherewithal to do it) as with layers from the neighbourhood, which is far better; the manner and method of both which is very like to that we have already delivered and taught you. And theſe directions concerning *Italian* plantations of trees for ſupporting vines, which we have given, are ſufficient.

CHAP. VII.

Of Gallic *Plantations of Trees for ſupporting Vines.*

THERE is another ſort of plantation of trees uſed in *Gaul* for ſupporting vines, which is called *rumpotinum*, that requires a low tree, which does not produce many leaves; for which buſineſs the poplar-tree ſeems the fitteſt. This tree is very like the cornel-tree; yea, the cornel-tree alſo, the horn-beam, and the mountain-aſh, and ſometimes alſo the willow, is planted by moſt people for this very purpoſe; but the willow muſt not be planted, except in watery places, where other trees with difficulty take root, becauſe it hurts the taſte of the wine. The elm-tree alſo may be ſo ordered, that it may have its top cut off while it is yet tender and young, that it may not exceed the

(8) *Tradux* is a rod of a vine, carried from the tree which ſupports it, to another at ſome diſtance from it, and is either tied to that tree, or to a branch of the vine, which grows upon the ſame. This is done when a tree cannot ſupport all the branches of its own vine. Theſe branches, as *Varro* ſays, *lib.* 1. *cap.* 8. were by ſome called *rumpi*, perhaps becauſe they were broken, as it were, or bended from the vine and tree on which they grew, and carried to another tree. They may be called *plaſhed vines*. A plantation of low trees for ſupporting ſuch vines was called *rumpotinum*, probably becauſe they made uſe of them for thoſe plaſhed vines, which they called *rumpi*; yet, from the account our author gives of this *rumpotinum*, there is reaſon to think, that this ſort of plantation was ſo called from their breaking off the tops of the young trees, in order to prevent their growing too high.

height of fifteen feet; for I have obſerved the *rumpotinum*, or a plantation of dwarf-trees for ſupporting of vines, commonly ſo ordered, that the ſtories were contrived, in dry and hilly places, about eight feet, and, in flat and ouſy lands, about twelve feet *from the ground*. But, for the moſt part, that tree is divided into three boughs, upon each of which, from both ſides, ſeveral arms are ſet apart for growth. Then almoſt all the rods are pared off them at the time when the vine is pruned, that they may not form a ſhade.

If there is no corn ſown among thoſe dwarf trees, they leave ſpaces of twenty feet between them on both ſides; but, if people are fond of having a crop of corn, they leave forty feet on one ſide, and twenty on the other. As to all other things, they are managed and carried on here in the ſame manner, as in *Italian* plantations of trees for ſupporting vines; *viz.* the vines are ſet in long trenches; they are taken care of, and dreſſed with the ſame diligence, and divided into boughs; and new vine-branches are brought over every year from the neighbouring trees, and tied together, and the old ones are cut off. If a young branch of a vine, that is extended and carried from one tree, does not reach to that which is brought from another, let them be tied with a rod put between them. Then, when the fruit ſhall preſs them downwards with its weight, let props be put under them to ſupport them. But this kind of plantation for ſupporting vines, and all other trees whatſoever, the deeper the ground is plowed and digged round them, the greater abundance of fruit they produce; but, whether it may be expedient for a Maſter of a family to make them, the culture of them teaches him.

CHAP. VIII.

Of the ſeveral Kinds of Olive-trees (1).

NEvertheleſs the culture of every kind of tree is more ſimple than that of vines; and, of all ſtems, the olive-tree, which is the chief of all trees, requires the leaſt expence by far: for, altho' it does not bring

(1) *Pliny* tells us, that the culture of the olive-tree was not introduced very early into *Italy*; and that *Feneſtella* affirmed, that, in the reign of *Tarquinius Priſcus*, in the year of the city 183. there was not an olive-tree either in *Italy*, *Spain*, or *Africa*; but that, in his time, the way of cultivating it was ſo well known, that it had paſſed the *Alps*, and got into

bring fruit conſtantly every year, but almoſt every other year, nevertheleſs there is very great account to be made of it, becauſe it is ſupported with very ſlight culture; and, when it does not array itſelf either with bloſſoms or fruit, it ſcarcely requires any expence; but, if any charges are beſtowed upon it, it thereupon multiplies its fruit. When neglected for ſeveral years, it does not decay, as the vine; and, even in that very time alſo, it yields ſomething, notwithſtanding, to the Maſter of the family; and, when culture is beſtowed upon it, in one year it is recovered. Wherefore alſo we have thought it proper to give directions carefully concerning the culture of this kind of tree.

I believe there are many kinds of olive-trees, as there are of vines; but only ten of them have come to my knowledge, the *Pauſian* (2), the *Algian* (3), the *Licinian* (4), the *Sergian* (5), the *Nevian*, the *Culminian* (6), the *Orchis* (7), the *royal olive-tree* (8), the *circites* (9), and the

into *Gaul*, and the middle of *Spain*; and that they planted it in nurſeries; and, the year after they tranſplanted it, they received fruit of it.

Columella mentions ten different ſorts of olive-trees. *Virgil* mentions only three ſorts, the *orchitis*, the *radius*, and the *pauſia*. *Pliny* mentions ſome ſorts, which our author takes no notice of. None of the ruſtic writers give us any exact deſcription of the different characters of all theſe trees, ſo as to enable one to diſtinguiſh them. They do little more than mention them by their names, as being then very well known; and their chief buſineſs was to teach how to cultivate them.

The olives, as many other fruit-trees, took their names, ſometimes from the country where they firſt were known to grow, and from which they were brought into *Italy*; or from the perſon, who firſt brought them out of *Aſia* or *Greece*, and firſt cultivated and improved them; and theſe names give little or no knowledge of the tree. Others of them have their names from ſome diſtinguiſhing quality of the fruit, ſhape, or colour; as may be ſeen in thoſe different ſorts mentioned by our author, of which there are ſeveral, whoſe diſtinguiſhing characters we know nothing of.

(2) *Pauſia*. *Virgil* ſeems to inſinuate, that the berry of this is bitterer than that of other ſorts of olive-trees; and *Pliny* ſays, that they have moſt fleſh upon them, and, being very tender, fall ſooneſt to the ground; as do alſo thoſe of the *orchitis* and *radius*. *Iſidorus* ſays, that it is very proper for green and ſweet oil. But I ſuppoſe the reaſon he aſſigns why it is called *pauſia* will not give any great ſatisfaction, *quod paviatur*, i. e. *tundatur*; for they were all bruiſed, in order to expreſs the oil out of them.

(3) *Algiana*. Whther this is ſo called becauſe it ripens with the cold weather, and does not ſuffer by it, or from the name of ſome perſon or place, I know not.

(4) *Licinian*. This olive has its name from the perſon who firſt brought it into *Italy*, and cultivated it. It is a callous fruit, of a ſmall ſize, late in ripening, reſiſts moiſture, and yields an excellent oil, and the beſt both for eating and ointments.

(5) *Sergian*. This probably has its name from *Sergius Orata*. Our author, *lib.* viii. *c.* 16. makes mention of two famous *Romans*, *Sergius Orata*, and *Licinius Murena*. Perhaps they introduced theſe two olive-trees laſt-mentioned.

(6) *Culminea*, by *Pliny* called *comminiana*, by *Cato*, *colminiana*, and by *Varro*, *colminia*. Theſe three above-mentioned are all callous and ſmall, and therefore the moiſture makes no impreſſion upon them. They begin to grow black in the month of *February*, when the weſtern winds begin to blow. *Pliny* ſays, that theſe callous olives yield the moſt oil; and that it is a common error to think, that the largeſt olives yield the moſt; for they eaſily admit the moiſture, which makes them ſwell, and fills them with lees.

(7) *Orchis*,

the *myrtle olive* (10); of all which the berry of the *Pauſian* is the ſweeteſt, and that of the royal the moſt beautiful, which is rather fit for food, than for oil. Nevertheleſs the oil of the *Pauſian* is of an excellent taſte while it is green; but it ſpoils when it is long kept. The *Orchis* alſo, and the *Radius*, are better gathered for food, than for liquor. The *Licinian* gives the beſt oil, and the *Sergian* the moſt; and, for the moſt part, all the larger olives are fitter for eating, and the leſſer for oil. None of theſe kinds endures either an exceſſive hot, or a cold conſtitution of the climate: therefore, in very hot places, it rejoices in the north ſide of a hill; and, in hot, on the ſouth ſide. But it neither loves low places, nor ſuch as very high; but rather ſmall hills, ſuch as we ſee thoſe of the *Sabines* in *Italy*, or in the whole province of *Bætica*.

Moſt people think, that this tree either does not live, or at leaſt is not fertile, beyond ſixty miles from the ſea; but, in ſome places, it thrives very well. The *Pauſian* bears the heats beſt, the *Sergian* the cold. The fitteſt kind of earth for olives is that which has gravel under it, if chalk, mixed with coarſe ſand, be placed above it. The ſoil, where there is fat coarſe ſand, is not leſs eſteemed; but a denſer earth alſo, if it be moiſt and rich, receives and entertains this tree very commodiouſly. That, which is wholly chalk, muſt be rejected, and much more that alſo, which is full of ſprings of water, and wherein an ouſineſs always remains. Land, that is lean, with coarſe ſand, and bare gravel, is unfriendly to it; for, tho' it does not intirely die in this kind of ſoil, nevertheleſs it never recovers ſtrength: yet it may be planted in corn-land, where either the arbute or ſtrawberry-tree, or the evergreen oak-tree, have ſtood; for the common oak, even when it is cut down, leaves roots that are hurtful to the olive-yard, the poiſon of which kills the olive. But theſe things I had to ſay to you in general

(7) *Orchis*, *Orchita*, *Orchitis*. In ſome editions of *Virgil*, and in *Iſidorus*, it is called *Orchades*. The firſt termination comes neareſt to the *Greek* word from which it has its name, as *Servius*, and ſome other authors ſay, ὄρχις, *teſticulus*, from the reſemblance they bear to the teſticles, perhaps both in their ſhape, and hanging in pairs upon their pedicle. *Pliny* ſays, *lib.* xv. *c.* 3. that it yields the moſt oil.

(8) *Regia*, the royal olive, ſo called from its excellent qualities, or rather from its ſize, from which, by ſome, theſe olives were called *majorinæ*. They were the largeſt of all, and had the moſt fleſh; but yielded the leaſt juice.

(9) *Circites* is the ſame with *Radius*, and by *Iſidorus* theſe are called *radiolæ*, as he ſays, *eo quod oblongæ ſunt in modum radiorum*. It is probable, that they were ſo called, becauſe they were ſomewhat like a weaver's ſhuttle, ſmall at each end, and thick in the middle. *Servius* alſo ſays, that they were ſo called from their long ſhape, *Vir. georg.* ii. 85. κερκὶς, *radius textorius*.

(10) *Myrtea alea*, the myrtle olive, ſo called from the reſemblance it bears to the myrtle-tree, or ſome likeneſs in their berries.

concerning this tree of every kind. Now I ſhall particularly deſcribe its culture.

CHAP. IX.

Of making Nurſeries for Olive-yards.

LET a nurſery for an olive-yard be prepared in a free air, in land indifferently ſtrong, but juicy; in a ſoil neither denſe nor looſe, yet rather in that which is open. This kind of earth is almoſt black, which when you have paſtinated three feet deep, and ſurrounded with a deep ditch, that cattle may have no acceſs to it, give it leave to ferment. Then take off from the trees the young, tall, and fair branches, and ſuch as are the moſt fertile, and which your hand can ſpan, when it takes hold of them (that is, about the thickneſs of the handle of any thing); and from theſe cut off the very freſheſt cuttings, ſo as you may not hurt either the bark, nor any other part, except where the ſaw ſhall have cut through: and this is eaſily done, if you firſt make a forked piece of wood to ſaw them upon, and cover with hay or ſtraw that part, which you are going to cut the branch upon, that the cuttings, which are placed upon it, may lie ſoftly, and be cut without hurting the bark. Then let the cuttings be cut off with the ſaw a foot and an half long, and let their wounds be ſmoothed at both ends with a pruning-knife, and let them be marked with red lead, that ſo they may be ſet into the ground, after the ſame manner as the branch ſtood upon the tree, looking with its lower part to the earth, and with its top to the heavens; for, if it be put under-ground inverted, it will with difficulty ſtrike root, and, when it has recovered itſelf, and got ſtrength, it will be barren for ever. But you muſt daub the heads and the lower parts of the cuttings with dung mixt with aſhes, and ſo immerge them wholly, that ſo the rotten or looſe crumbling earth may come over them four fingers deep. But they are put under-ground with two marks or indexes on each ſide of them. Theſe may be taken from any tree, and placed at a ſmall diſtance hard by them, and tied together with a ſtring in the uppermoſt part, that they may not, when ſtanding by themſelves, be eaſily thrown down. It is good to do this, becauſe of the ignorance of the Diggers, that, when you ſhall direct your nurſery to be cultivated, either with ſpades, hoes, or ſarcles, the cuttings, which you have ſet, may not be hurt.

Some

Some think it better to form their nurſery with eyes, and to diſpoſe or ſet them in like manner regularly upon a line marked out with a cord; but both the one and the other ought to be planted after the vernal Equinox, and the nurſery ought to be very frequently hoed the firſt year. The next and following years, now when the ſmall roots of the plants have gathered ſtrength, it ought to be cultivated with ſpades; but it will be proper to abſtain from pruning for two years, and that the third year two ſmall branches be left upon each plant, and the nurſery frequently hoed. The fourth year the weakeſt of the two branches muſt be cut off. The little trees, being thus cultivated, are fit, the fifth year, to be tranſplanted. But, in lands that are dry, and not at all ouſy, the plants are beſt ſet in the olive-yards in autumn; but, in ſuch lands as are rich and moiſt, in the ſpring-time, a little before they bud. And trenches of four feet are prepared for them a year before: or, if ſo much time is not allowed them, let ſtraw be burnt in the trenches, that the fire may make them looſe and crumbling, which the ſun and the hoar-froſt ought to have done.

In ground that is fat, and fit for corn, the leaſt ſpace between the rows ought to be ſixty feet on one ſide, and forty on the other; but in that which is lean, and not fit for corn, twenty-five feet. But it is proper, that the rows be directed and turned towards the weſt, that they may be refreſhed with the ſummer breezes blowing freely through them. But the little trees themſelves may be tranſplanted in this manner: Before you pull up the little tree, mark with vermilion that part of it, which looks to the ſouth, that it may be ſet in the ſame manner it was in the nurſery; then that the ſpace of one foot be left to the little tree all round it, and ſo the plant be digged up with its own turf; and, that the ſaid turf may not fall into pieces in taking it out, you muſt weave ſmall twigs of rods, and join them to one another, and apply them to the lump of earth that is taken out, and bind it ſo with the twigs, that the earth, being preſſed faſt together, may be kept, as it were, ſhut up cloſe within them. Then, having digged up the lower part, you muſt move the lump gently, and bind it with the rods, which you have put under it, and ſo carry the plant from the one place to the other. And, before you ſet it, you muſt dig the bottom of the trench with hoes: then put earth into it, which has been well wrought and broken with the plough, (provided nevertheleſs, that the upper ground be fat) and ſo ſtrew ſeeds of barley under it; and, if there be water ſtanding in the trenches, it muſt be all drawn out before the trees be put down into them. Then you muſt throw ſmall ſtones into them, or gravel mixt with fat earth; and, after the plants are ſet, the

ſides

ſides of the trench muſt be pared all round, and ſome dung put in between them. But if it does not ſuit to remove the plant with its own earth, then it is beſt to ſtrip the ſtock of all its twigs and leaves, and, having ſmoothed its wounds, and daubed them with dung and aſhes, to ſet it in the trench or furrow.

But a trunk or ſtock, which is as thick as one's arm, is fitter for tranſplanting; alſo that which is of a much larger and ſtronger growth, may be tranſplanted, which it is proper ſhould be ſo ſet, that if it be in no danger from the cattle, very little may appear above the trench; for it thrives the better, and puts forth its leaves more joyfully. Nevertheleſs, if the incurſion of cattle cannot be otherwiſe prevented, the ſtock muſt be placed higher, that it may be ſecure from the injury of the cattle. Alſo the plants muſt be watered, when droughts come on, and they muſt not be touched with a knife till two years are expired. And they ought to be ſo lopped at firſt, that the ſingle ſtalk or ſtem may exceed the depth of the greateſt trench (1), that afterwards, in ploughing, the ox may not hurt his haunches, or any other part of his body.

It is alſo beſt to fence the plants all round with pales, when they are firſt planted, and then to divide the olive-yard, now it is conſtituted and finiſhed, into two parts, which may be cloathed with fruit every other year by turns. For the olive-tree does not produce fruit in great plenty, two years ſucceſſively. When the land that lies under it is not ſown, the tree puts forth ſmall ſhoots; when it is repleniſhed with ſeeds, it brings forth fruit: ſo the olive-yard, being thus divided, brings an equal income every year. But it ought tobe plowed twice every year at leaſt, and digged deep all round with hoes. For, after the Solſtice, when the earth gapes with the fervent heats, care muſt be taken, that the ſun may not penetrate thro' the chinks to the roots of the trees. After the autumnal Equinox, the trees muſt be ſo ablaqueated, that, if the olive-tree be upon a declivity, furrows may be drawn from the higher part, which may convey the muddy water to the ſtock of the tree. Then all the young ſhoots, ſprung out of the lower part of the tree, muſt be extirpated yearly, and every third year the olive-trees muſt be nouriſhed with dung (2); and the olive-yard muſt

(1) *Simplex ſtilus altitudinem maximi ſcrobis excedat. Geſnerus* is of opinion, that it ought to be *bovis* inſtead of *ſcrobis*, which is not improbable; and then the meaning of the author is, that the ſtem ought to be higher than the higheſt ox, that he may not hurt his haunch in plowing.

(2) *Ac tertio quoque fimo vel.* This ſentence ſeems to be imperfect; ſomething or other, wherewith the olive-tree was nouriſhed, is wanting; probably, it is *amurca*, the

muſt be dunged in the ſame manner I propoſed in the ſecond book. Nevertheleſs, care muſt be taken of the corns.

But if you have only the doing ſervice to the trees themſelves, which you have planted, in view, ſix pounds of goats dung, and a ſingle *modius* of dry dung (3), or one *congius* of lees of oil, ought to be thrown into the roots of each of them in autumn, that the dung being throughly mixed with it, it may warm the roots of the olive-tree in winter. Lees of oil muſt be poured into them when they are ſtrong, and in a thriving condition; for if worms, or other animals, have got into them, during winter, they are killed by this medicament. Alſo for the moſt part, both in dry and moiſt places, trees are infeſted with moſs; and, unleſs you cut it off with an iron tool, the olive-tree will neither produce fruit nor leaves in abundance. Moreover, the olive-yard muſt be pruned alſo, after ſeveral years intermiſſion: for it is proper to remember the old proverb, *That he who plows his olive-yard, aſks fruit; he that dungs it, begs and intreats it; but he who laps it, forces it.* Nevertheleſs, it will be ſufficient to do this every eighth year, leſt the fruit-bearing branches be cut off from time to time.

It often happens alſo, that, tho' the trees thrive mighty well, yet they produce no fruit. It is proper, that theſe be bored with a *Gallic* augre, and ſo a green graft, or ſlip of a wild olive-tree be put into the hole; thus the tree, being as it were impregnated with fruitful ſeed, becomes more fertile. But alſo, without laying open the roots, it muſt be aſſiſted with lees of oil, wherein there is no ſalt, and with hogs-ſtale: or our own old urine, of both which a certain quantity is obſerved. For one urn of it will be abundantly enough for the greateſt tree, if it be mixed with water. Alſo, thro' the badneſs of the ſoil, olive-trees uſe to deny their fruit; which thing we may thus remedy: We muſt ablaqueate them very deep all round; then we muſt put more or leſs lime round them, according to the bigneſs of the tree; but the leaſt tree requires a *modius* of it. If this remedy has no effect, we muſt have recourſe to ingrafting as the only refuge. But after what manner the olive-tree muſt be ingrafted, we ſhall afterwards declare. Sometimes alſo, in an olive-tree, one branch thrives ſomewhat better than the reſt; and, unleſs you cut this off, the whole tree will languiſh. What has been thus far ſaid concerning olive-yards, is ſufficient. It remains

lees of oil; which, in other places, our author, as alſo *Varro* and *Palladius*, recommend, as of very great benefit to olive-trees.

(3) *Palladius*, who borrows moſt things from *Columella*, when ſpeaking of this article, inſtead of *ſtercoris ficci*, as in *Columella*, has *cineris modii ſinguli*, a *modius* of aſhes to each of them.

to

to give ſome account of the way of managing pomiferous trees, concerning which we ſhall give directions in what follows.

CHAP. X.

Of pomiferous Trees.

YOU muſt incloſe and fence all round the place for an orchard, before you ſet the plants, either with walls, or an hedge, or with a ſteep ditch, that it may refuſe a paſſage not only to cattle, but alſo to men: becauſe if their tops be often handled by men, or gnawn and browſed by the cattle, the plants can never arrive at their due growth. But it is neceſſary to range the trees according to their ſeveral kinds; and eſpecially that the weak be not oppreſſed by the ſtronger, becauſe it is neither equal to it in ſtrength nor bigneſs, and it grows up in an unequal ſpace of time. Earth that is fit for vines, is alſo proper for trees. Dig the trench one year before you reſolve to ſet your plants; ſo it will be macerated with the ſun and the rains; and what you ſet in it will ſoon take root. But if you have a mind both to make the trench, and plant the trees, the ſame year, dig the trenches two months before at leaſt, and afterwards warm them by burning ſtraw in them; and the broader and more open you ſhall make them, the better and the greater plenty of fruit you ſhall gather. But let the trench be made like an oven or furnace, the bottom of which is wider than the upper part, that the roots may be at more liberty to extend themſelves on every ſide, and that leſs cold in winter, and leſs heat in ſummer, may penetrate thro' its narrow mouth; and alſo, that in ſloping places the earth, which is gathered into it, may not be waſhed away by the rains.

Plant the trees thin, and at a conſiderable diſtance, that when they grow, they may have ſpace wherein they may extend their branches: for, if you plant them thick, you can neither ſow any thing below them, neither will they themſelves be fruitful, unleſs you pull up ſome of them here-and-there, and thin them. Therefore it is proper to leave forty, or at leaſt thirty feet between the rows. Chuſe and gather the plants as thick at leaſt as the handle of a prong, ſtraight, ſmooth, tall, without blotches or gaſhes, and with the bark ſound and intire. Theſe will take root well and ſpeedily. If you take them off from old branches, chuſe them of thoſe alſo which bring

good fruit, and in great plenty, every year; and rather thoſe which are expoſed to the ſun, than thoſe which are incloſed, and ſurrounded with ſhades, branches, and other plants. But, before you tranſplant the little trees, obſerve what winds they were before expoſed to, and afterwards put to your hands, that you may tranſplant them from a ſloping and dry land to that which is moiſt. Plant that which is three-forked preferably to any other: let it ſtand three feet above-ground at leaſt. If you have a mind to place two or three little trees together in the ſame trench, take care that they touch not one another; becauſe by mutual contact they will either rot together, or periſh by the worms. When you ſet the plants, put down into the bottom of the trench, both on the right and left, bundles of ſprays, of the thickneſs of one's arm, ſo as they may appear a little above the ground; by which you may with little labour adminiſter and convey water to their roots in ſummer.

Plant trees and plants of trees with roots in autumn, that is, about the firſt and fifteenth of *October*: in the beginning of the ſpring ſet them before the trees put forth their buds (1). And, that the moth-worm may not be troubleſome to fig-tree-plants, put down into the bottom of the ditch a cutting of the maſtich-tree, with its top inverted. Plant not the fig-tree during the colds: it loves places expoſed to the ſun, that are full of ſmall ſtones, and gravelly, and ſometimes it loves rocky places. This kind of tree ſoon grows ſtrong, if you make the trenches large, open, and wide. The ſeveral kinds of fig-trees, tho' they differ, and are unlike, in their taſte, habit, form, and make, are planted after one manner, but with due regard to the difference of land. In cold and watery places, plant the early-ripe fig-trees in autumn, that you may gather the fruit off them before the rains come on. Plant winter fig-trees in warm places: but if you ſhall have a mind to make a fig-tree late in ripening, tho' it is not ſo naturally, then ſhake off its unripe figs, or the fruit which it firſt produces, it will again produce a ſecond fruit, which it will defer ripening till winter. Sometimes alſo it is an advantage to cut off with a knife the uppermoſt tops of the fig-tree, after they have begun to put forth their leaves: ſo the

(1) *Arbores ac ſemina cum radicibus autumno ſerito; primo vere, antequam germinent arbores, deponito.* *Pontedera* thinks that this ſentence is imperfect, and that it is not to be underſtood, that trees ſhould be planted in the ſpring, but cuttings and branches, as appears by the author's book *de arboribus*; and therefore *taleas* and *ramos* ought to be put before *vere*. Others are for putting *alteras* before *vere*; and, as *Geſnerus* ſays, it is very likely, that the author, in the laſt period of the ſentence, ſpeaks *of ſome other kind of plants without roots.*

trees

trees become firmer, and more fertile; and it will always be proper, as ſoon as the fig-trees ſhall have begun to put forth leaves, to dilute and diſſolve okre in lees of oil, and pour it with human dung about their roots. This makes the fruit more plentiful, and the ſtuffing and pulp of the fig fuller and better. But we muſt chiefly plant the *Livian* (2), *African*, *Chalcidian* (3), *Lydian* (4), *Calliſtruthian* (5), *Topian* (6), *Rhodian*, *Libyan* (7), and winter fig-trees; alſo all thoſe that bear a floret twice or thrice in a year (8).

(2) *Ficus Livianæ.* Fig-trees, as ſeveral other fruit-trees mentioned by *Columella*, have for the moſt part their names from the places from which they were firſt brought, or from the perſons who firſt brought them into *Italy*, and cultivated them, or were mighty fond of them. Thus the *Livian* fig-tree, they ſay, had its name from *Livia*, wife of the Emperor *Auguſtus*: ſhe made but a bad uſe of her favourite figs, if it be true, as ſhe is charged, that ſhe poiſoned her husband with them.

(3) *Chalcidiæ*, from *Chalcis*, a city in *Eubœa*, now called *Negroponte*, of which *Pliny* ſays *there were two ſorts, one black, the other white.*

(4) *Lydiæ.* The *Lydian* fig was of a purple colour, as *Pliny* ſays. *Columella* in his tenth book ſays, that it had a painted back, *& picto Lydia tergo.*

(5) *Calliſtruthiæ*, called *paſſariæ*, or rather *paſſerariæ*, probably becauſe ſparrows fed greedily upon them. *Pliny* ſays, that they were of an excellent taſte, but the coldeſt of all figs. *Columella*, in his tenth book, mentions this fig, *& calliſtruthis roſeo quæ ſemine ridet.* When it was laid open, it ſeemed to ſmile with its bright, reddiſh, roſe-coloured ſeeds.

(6) *Sulcæ*, *Topiæ.* Theſe two kinds of fig-trees are mentioned neither by *Pliny*, nor *Varro*, nor *Athenæus*; nor does our author mention them in his tenth book, where he mentions moſt of the other ſorts. *Pontedera* thinks, that *Topiæ* ought to be read *Chiæ*, which were a ſort of fig-trees firſt brought from the iſland of *Chios*. The *Chian* fig was in great eſteem, as ſeveral authors teſtify. *Martial* ſays, it was of a pungent taſte, and pleaſed him much. *Columella* mentions it in his tenth book, which makes it probable he would not have omitted it here, where he enumerates the ſeveral ſorts of fig-trees. Whether *Sulcæ* be a corruption of *Mariſcæ*, is very uncertain. Both *Cato* and *Pliny* mention the *Mariſcan* fig, as alſo our author, in his tenth book. It was a large fat fig, not agreeable to the taſte, rather fit to be preſerved, than to be eaten green. As the *Chian* and *Mariſcan* figs were ſo well known, and ſo often mentioned, and the *Topiæ* and *Sulcæ* are obſcure and uncertain, it is probable, that *Columella* intended the firſt, and that the laſt are *corrupt readings, of which no account can be given.*

(7) *Libycæ.* *Columella* here mentions theſe as different from the *African*; ſo that father *Hardouin* ſeems to be miſtaken, when he ſays, *illas vocat Columella Africanas.* Perhaps *Pliny*, who does not mention them under this name, looked upon them as the ſame with the *Alexandrian*, which he ſays were black, and had a white chanel or clift, *candicante rima*; by which it is probable he meant a hollow or chanel that ran lengthwiſe round the fig, and is what *Columella* means, when he calls it *ſciſſa Libyſſa*; for when, thro' over-ripeneſs, figs begin to open, the cleft or opening at firſt will appear whitiſh in them all; ſo that the *candicans rima*, probably, was a mark upon the outſide appearing like a cut, which diſtinguiſhed this from other ſorts. Father *Hardouin* explains it of its being white when it opens; *cum hiat, albet.*

(8) *Biferæ*, *triferæ*, *floſculi.* *Pliny*, in his *Nat. Hiſt. lib.* xv. *cap.* 18. ſays, that ſome of the *Chalcidian* fig-trees bear fruit thrice a year; and *lib.* xvi. *cap.* 25. ſays, that fig-trees have no flower or bloſſom, as ſome others alſo aſſert. So that by *floſculus* here, probably, the author means, the firſt breaking out or appearance of the young fruit.

About

About the firſt of *February* plant the almond-tree, which begins to bud the firſt of any: it requires hard, warm, dry land. For, if you plant the almond in places of different qualities, for the moſt part it rots. Before you put the nut into the ground, ſteep it in honey-water, not too ſweet: ſo, when it is grown up, it will yield fruit of a more agreeable taſte, and, in the mean time, it will put forth its leaves the better, and the more ſpeedily. Place three nuts in a triangle, that a nut may be at leaſt four fingers breadth diſtant from a nut, and that two of them look towards the weſt (9): but each nut puts forth one root, and creeps forth with a ſingle ſtalk. When the root reaches to the bottom of the trench, it is *checked* by the hardneſs of the ground, and bended back again; and, from the ſummit or top of the two branches the root forms, it ſends out other roots (10).

You may make an almond, and a filberd, become a *Tarentinian* (11) nut-tree in this manner. Into the trench, wherein you deſign to plant your nuts, put ſmall earth about half a foot deep, and there ſet a plant of fennel-giant. When the fennel-giant is ſprung up, cleave it, and in its pith hide an almond or filberd-nut without a ſhell, and ſo put it under-ground. Do this before the firſt of *March*, or alſo between the ſeventh and fifteenth days of the ſaid month. At the ſame time you muſt plant the walnut, the pine, and the cheſnut-trees.

It is right to plant the pomegranate from the ſame time to the firſt of *April*, which, if it produces acid, or not ſo ſweet fruit as you deſire, may be corrected in this manner. Water the roots of it with ſtale urine mixed with human and hogs dung. This will both make the tree fertile, and the firſt years it makes the fruit of a winy taſte, and, after five years, makes it ſweet, and without any woody ſubſtance. We have diſſolved a very little laſerwort-juice in wine, and ſo have

(9) *Et anceps in favonium ſpectet.* The three nuts were to be placed in a triangle, not equilateral, as *Geſnerus* thinks, and that the top of the triangle is what the author means by *anceps*; but it is more probable, that *Columella's* meaning is, that the three nuts were to be ſo placed, as that two of them might incline towards the weſt.

(10) *Et ex ſummo duum ramorum ambas radices emittit.* In his book *de arboribus*, it is *extenſa in modum ramorum* alias *radices emittit*; and not *ambas*, which, as *Pontedera* thinks, is probably the true reading here. *Geſnerus* thinks it ought to be read *& ex ſe in modum ramorum amplas radices emittit.* Perhaps the two branches the root forms after its bending may be properly enough expreſſed by *ambas*, i. e. it forms both its roots from the bending it made of the firſt root; but it is more probable, that *alias* is the true reading, ſeeing the bending of a root will naturally put forth other roots, as, in vines, any bending will put forth young ſhoots.

(11) *Tarentina nux.* A *Tarentinian* nut was ſo ſoft, that it could ſcarcely be handled without breaking, as *Macrobius* ſays. *Pliny* ſays, that there were two ſorts of them; one with a brittle ſhell, and the other harder. They were common about *Tarentum.*

anointed

anointed the uppermoſt tops of the tree. This did correct the acidity of the apples. If, when you plant the tree, you place three ſtones at the very root of it, they will remedy and prevent the burſting of pomegranates upon the tree. But, if you have a tree already planted, ſow ſquills hard by the root of the tree. This may be prevented by another method alſo: when the apples are almoſt ripe, before they burſt, twiſt the ſmall branches upon which they hang. In the ſame manner they will keep even a whole year without ſpoiling.

Plant the pear-tree (12) in autumn, ſo that there may be at leaſt twenty-five days to come before winter. And that it may be fruitful, when it ſhall come to its full growth, lay its roots open to a conſiderable depth, and cleave the ſtock hard by the very root, and drive into the cleft a wedge of torch-pine-tree, and there leave it: then, after you have covered the roots of the tree, by replacing the earth, throw aſhes upon the earth. But we muſt take care to plant our orchards with the moſt generous pears that can be found. Theſe are, the *Cruſtuminian* (13), the *Royal* (14), the *Siguinian* (15), the *Tarentinian* (16), which are called *Syrian*, the *Purple-coloured*, the *Superb* (17), the *Barley-pear* (18), the *Anician* (19), the *Nævian*, the

(12) The ſame thing may be ſaid of pear-trees and apple-trees, as was ſaid of vines and olives, that the antient ruſtic writers give us but very little inſight into their different characters. It is probable, that moſt of them were ſo well known, that they thought it needleſs to deſcribe them; and that their buſineſs was chiefly to teach how to cultivate them. The greateſt part of them had their names from men who either brought them into *Italy*, or took great delight in them, and cultivated and improved them; who, as *Pliny* ſays, by ſo ſmall a matter, have rendered their memory immortal, as if they had done ſomething very notable in life. Others of them have their names from the countries and places from whence they were brought; and ſome of them from ſome quality or character peculiar to themſelves.

(13) *Cruſtumina pira*, ſo called from *Cruſtuminum*, a town in *Hetruria*, where they were beſt, and in greateſt plenty. *Pliny* commends them for their moſt agreeable taſte. *Servius* ſays, that they were partly red, and they were of a ſmall ſize.

(14) *Regia*, the royal pear. *Pliny* ſays, that it has a very ſhort pedicle or ſtalk, and grows cloſe to the branch; it is ſomewhat round. Father *Hardouin* ſays, it was what is now called a Bergamot-pear, from *Bergamo* in the State of *Venice*.

(15) *Siguina pira*, from *Siguia* a town in *Italy*. *Pliny* ſays, that by ſome they were called *teſtacea*; perhaps, becauſe they were fit for being preſerved and kept in earthen pots; but he ſays, they are ſo called from their colour.

(16) *Tarantina, quæ Syria dicuntur*. Both *Pliny* and *Servius* ſay, they were of a black colour; and they are commended by *Martial*, and other authors.

(17) *Superba*. *Pliny* ſays, they are ſo called, becauſe they come the firſt of any, and ripen very quickly; and they are of a ſmall ſize. Father *Hardouin* calls them *poires muſcates ou muſcadelles*, muſcadelle-pears.

(18) *Ordeacea*, barley-pears. *Pliny* ſays, they are ſo called, from the ſeaſon, or time when they are ripe, in the time of barley-harveſt. Father *Hardouin* calls them *St. John's* pears.

(19) *Aniciana*, ſo called, from ſome perſon probably who firſt introduced them. *Pliny* ſays, they are gathered after autumn, and that they are agreeable from their ſomewhat acid taſte.

Favonian (20), the *Lateritan* (21), the *Dolabellian* (22), the *Turranian* (23), the *Warden* (24), the *Honey-pears*, and the *Early-ripe*, and the *Venus-pears* (25), and ſome others, which it would be tedious now to enumerate.

Moreover, thoſe kinds of apples muſt be chiefly ſought after; the *Scandian* (26), the *Matian* (27), the *Orbicular* (28), the *Sextian* (29), the *Peluſian* (30), the *Amerinian*, the *Syrian*, or *red-coloured* (31), the *Honey-apples*, and *Quinces* (32), of which there are three ſorts, the *Struthian*, the *Orange* or *Gold-quinces*, and the *Muſt quinces*: all which not only yield pleaſure, but health alſo. The ſervice-apple, the apricot (33), and the peach (34) alſo, are not the leaſt beautiful and lovely.

(20) *Favoniana*, from one *Favonius*. *Pliny* ſays, that they were red, and larger than the Superb before-mentioned. Father *Hardouin* ſays, it is the great muſcadelle-pear.

(21) *Lateritana*, *Lateritiana*, *Laterana*, one and the ſame pear thus differently written. Probably it is ſo called, from its brick-colour.

(22) *Dolabelliana*. They have their name from *Dolabella*, a *Roman* citizen. *Pliny* ſays, that they had a very long ſtalk.

(23) *Turraniana*. This has its name from one *Niger Turranius*, mentioned by *Varro*, *lib.* ii. and commended as a great lover of cattle, *&c.*

(24) *Volema*. They were ſo called, becauſe they filled the hand. They were alſo called *libralia*, from their weight, *pound-pears*.

(25) *Venerea*, ſo called from their beauty. *Pliny* ſays, they were alſo called *colorata*, from their being as it were painted with ſeveral beautiful colours.

(26) *Mala Scandiana*, from one *Scandius*, as *Pliny* ſays.

(27) *Matiana*, from *Caius Matius*, a *Roman* knight, and a great favourite of the Emperor *Auguſtus*: he is probably the ſame whom *Columella* mentions in his twelfth book as author of three books of cookery, *&c.*

(28) *Orbiculata*, ſo called, from their round figure, as *Pliny* ſays; and adds, that they were originally of *Epirus*, and that the *Greeks* called them *Epirotica*.

(29) *Sextiana*, or rather *Seſtiana*, as *lib.* xii. 45. They are not mentioned by *Pliny* by this name. He ſays, there is a ſort which have their name from one *Geſtius*, which father *Hardouin* is inclined to change into *Seſtius*.

(30) *Peluſiana*, *Amerina*, from *Peluſium* in *Egypt*, and *Ameria* a town in *Umbria* in *Italy*.

(31) *Syrica*. *Pliny* ſays, they were ſo called, from their colour, being a bright red. *Iſidorus* ſays, that *Syricum* is a certain red colour or paint, which the *Syrophœnicians* gathered upon the ſhore of the *Red Sea*. *Pliny* ſays, that it is alſo a made colour, by mixing ſinoper, or ruddle, and ſandyx together. This laſt, he ſays, was alſo a made colour of ſandarac and ruddle an equal quantity, and toaſted in a furnace.

(32) *Cydonia*, *κυδώνια μῆλα*, from a town in *Crete*, called *Cydon*. The *Romans* called them *mala cotonea*. Our author mentions three ſorts of them. The *ſtruthia*, *Pliny* ſays, were of a ſmaller ſort: they were covered with much down, and had a ſtronger ſmell than the other ſorts, and were late in ripening. Why they were called *ſtruthia*, ſeems not ſo certain, whether from their ſize, or from ſparrows delighting in them. The ſecond ſort were called *chryſomela*, golden apples, and were diſtinguiſhed with inciſures, and of a colour inclining to gold. The third ſort were called *muſtea*, probably from their having the taſte of muſt, or new wine: they were early ripe. *Pliny* mentions a ſort of apples that were called *muſtea a celeritate miteſcendi*, becauſe they grew ſoon mellow, and that they afterwards were called *Honey-apples*.

(33) *Armeniaca*. Our author ſeems to rank theſe among apples: they are commonly

ſuppoſed

lovely. Plant apples, ſorbs, and plums, after the middle of autumn, till the thirteenth of *February*. The ſeaſon for planting mulberry-trees is from the thirteenth of *February* till the vernal Æquinox. Set the *Carob-tree* (35), which ſome call κεράτιον, and the peach-tree, during autumn, before winter. If the almond-tree bear but little fruit, after you have made a hole in the tree, drive a ſtone into it, and leave it there, that the bark may grow over it.

But, of all theſe kinds, it is proper to ſet the branches regularly in orchards, about the beginning of *March*, upon beds raiſed in the ſeveral diviſions thereof, and made of earth that has been well manured and dunged. Care muſt be taken, that when their ſmall branches are young and tender, they be, as it were, pampinated, or freed from ſuperfluous twigs and leaves, as you do vines; and that the plants be reduced the firſt year to one ſtem: and when autumn approaches, before the colds pinch them, and dry up their tops, it is proper to pull off all the leaves, and ſo cover them with thick reeds, which have their knots intire at one end, as it were with caps, and ſo to defend the yet tender rods from the cold and the froſts: then, after twenty-four months, whether you have a mind to tranſplant them, and range them in rows, or to ingraft them, you may ſafely enough do either the one or the other.

ſuppoſed to be what we call *Apricocks*; but *Pliny* ſeems to rank them among the plums, and ſays, they have their name from *Armenia*, their native country, and are commended for their agreeable ſmell.

(34) *Perſica, peaches.* *Pliny* ſays, they were foreign both to *Aſia* and *Europe*, being brought out of *Perſia*, and have their name from their country; that it was with difficulty they ſucceeded when tranſplanted, for which reaſon it was late before they came into *Italy*; and that it was falſe, that they were of a poiſonous quality in *Perſia*, as was commonly believed, as *Columella* ſays expreſly in his tenth book. But this was a vulgar opinion, and our author ſays nothing of it here.

(35) *Siliqua Græca*, which ſome call κερατιον, the *carob-tree*: it grows in great plenty in *Greece* and *Syria*, and in many parts of *Italy*. Its fruit is ſhaped like the husk, or pods, of ſome ſorts of pulſe. In *Syria*, it ſeems, the poorer ſort of people, and cattle, feed upon it, as we ſee in St. *Luke* xv. 16. where the prodigal ſon is ſaid to have deſired to fill his belly, ἀπὸ τῶν κερατίων, which is rendered *huſks* by our tranſlators of the New Teſtament.

CHAP. XI.

Of ingrafting of Trees.

EVERY kind of ſhoot or cyon can be graffed upon every kind of tree, if in its bark it is not unlike to that upon which it is graffed; but if it produces alſo like fruit, and at the ſame time, it may be graffed upon it perfectly well, without any ſcruple. Moreover, the antients have given us an account of three kinds of ingrafting, one, whereby a tree that is cut and cloven, receives cyons that are cut off *from ſome other tree*: a ſecond, whereby a tree, after it is cut, admits the plants or cyons between its bark and wood, both which kinds are proper for the ſpring-time; the third kind, whereby the tree receives the buds themſelves, with a little bark, into a part of itſelf, from which the bark is taken away, which Huſbandmen call *Emplaſtration* (1), or, as ſome call it, *Inoculation*. This kind of ingrafting is beſt put in practice in the ſummer-time. When we ſhall have deſcribed the way and method of theſe ingraftings, we ſhall alſo teach you that which we have invented.

Graff all trees in the increaſe of the moon, as ſoon as they ſhall begin to put forth their buds, but the olive-tree about the vernal Æquinox, till the thirteenth of *April*. From whatever tree you ſhall have a mind to chuſe grafts, and are going to take cyons, ſee that it be young and fertile, and with frequent knots or joints; and as ſoon as the buds ſhall ſwell, chuſe them of the thickneſs of your little finger, from the ſmall branches of one year old, which look to the riſing of the ſun, and are perfectly ſound. Let the cyons be two or three-forked. Cut the tree which you have a mind to graff upon, carefully with a ſaw, in that part where it is faireſt and in beſt condition, and without any ſcar; and you muſt be very careful not to hurt the bark. Then after you have cut the trunk through, ſmooth the wound with a ſharp iron tool. Then put down a ſmall iron or bone-wedge between the bark and the wood, not leſs than three fingers breadth; but do it very conſiderately, that you may not hurt or break the bark. Afterwards pare, with a ſharp pruning-knife, the cyons you have a mind to ingraft, on one ſide only, as far as the wedge which you have put down will

(1) *Emplaſtration*, ſo called, from the plaiſter of clay or wax uſed in this ſort of graffing. It is alſo called inoculation, or ineying, from the taking an eye or bud off a tree, and ſetting it into another, with a bit of the bark of its own tree.

give them ſpace, and do it ſo as you may not hurt the pith, nor the bark of the other ſide. When you have prepared your cyons, pull out the wedge, and immediately put down the cyons into the holes which you ſhall have made with the wedge driven in between the bark and the wood; but inſert the cyons by that end which you have pared, in ſuch a manner, that they may ſtand out from the tree half a foot, and no more. You may very well graff two grafts into one tree; or, if the trunk be larger, you may graff more. Let there be a ſpace of four fingers breadth between them: do theſe things according to the bigneſs of the tree, and the goodneſs of the bark. When you have thruſt down all the grafts which that tree will ſuffer, bind the tree faſt with elm-tree inward bark, or with a bulruſh, or a willow. Then daub the wound all over with well-wrought clay, mixed with ſtraw, and the ſpace which is between the grafts, ſo far, as that the grafts may appear and ſtand out at leaſt four fingers breadth above it; then put moſs upon it, and bind it ſo, that the rain may not ſink into it.

Nevertheleſs, ſome are better pleaſed with making a place for the grafts with a ſaw in the ſtock of the tree, and to ſmooth the parts which are cut, with a ſmall penknife, and ſo to fit the grafts to them. If you have a mind to ingraft a very ſmall tree, cut it off very low, ſo that it may ſtand only one foot and an half above the ground; and then when you have cut it through, ſmooth the wound carefully, and, with a ſharp penknife, cleave the middle of the ſtock a very little way, ſo that there may be a cleft in it of three fingers breadth; and then inſert a wedge into it, whereby it may be kept open; and put down into it grafts pared on both ſides, ſo that you may make the rind, or inward bark of the graft, equal to the rind of the tree. When you have carefully fitted the grafts, take out the wedge, and bind up the tree, as I ſaid above: then heap up the earth about the tree to the very place where the ingraftment is made; this will defend it moſt of any thing from the wind and heat.

The third kind of ingraftment, inaſmuch as it is exceeding nice and delicate, is not fit for all ſorts of trees; but, for the moſt part, ſuch as have a moiſt, juicy, and ſtrong bark, admit of ſuch an ingraftment; as the fig-tree; for it yields great abundance of milk, and has a very ſtrong bark. Therefore it is exceeding proper to be graffed upon after this manner: Chuſe young and fair branches from off that tree from which you have a mind to take your grafts; and in them take particular notice of the eye, which ſhall make a fair appearance, and afford a certain hope of a bud: mark it all round, about two fingers ſquare, ſo that the eye may be in the middle; and ſo cut it all round

with a ſharp penknife, and take off the bark carefully, that you may not hurt the gem. After this, chuſe alſo the faireſt branch of the tree which you are about to inoculate, and cut all round the ſame quantity of its bark, and take it off the wood: then fit the ſcutcheon, which you have prepared, into that part which you have ſtripped of its bark, ſo that it may agree exactly to the part from which the bark is taken. When you have done theſe things thus, bind it well round the gem, and beware, that you do not hurt the bud itſelf: then daub the joinings and bindings with clay, leaving a ſpace, that the gem may be at liberty, and not be preſſed with the binding: but chop off all the under ſhoots and upper branches of the tree which you have graffed upon, that there may be nothing whereby the juice may be diverted, and to which it may miniſter nouriſhment rather than to the graft. After the twenty-firſt day, unbind the ſcutcheon, and with this kind of graffing the olive-tree alſo is graffed upon with exceeding good effect.

We have already taught you that fourth kind of graffing, when we treated of vines: therefore it is needleſs to repeat, in this place, the way and method of terebration, which we have already deſcribed. But, foraſmuch as the antients denied, that every kind of graft might be graffed into every kind of tree, and eſtabliſhed, as a certain law, that limitation, as it were, which a little before we made uſe of, *viz.* that only thoſe grafts could coaleſce, which, in their bark, and rind, and fruit, were conſimilar to thoſe trees upon which they are ingrafted; we thought it proper, that this erroneous opinion ſhould be confuted, and a method delivered to poſterity, whereby every kind of graft might be graffed upon every kind of tree. But that we may not weary the reader, by drawing out this book to too great a length, we ſhall ſubjoin, as it were, one example, whereby all ſorts of grafts may be graffed upon all ſorts of trees.

Dig a trench four feet every way, at ſuch a diſtance from an olive-tree, that the extreme branches of the olive may reach to it: then plant in the trench a ſmall fig-tree, and take great care, that it become fair, ſound, and ſtrong. After the ſpace of three years, when it has had a large-enough growth, bend downwards the branch of the olive-tree, which ſeems to be the faireſt and the goodlieſt, and tie it to the ſtock of the fig-tree; and ſo, having cut off all the other ſmall branches, leave only thoſe tops which you ſhall have a mind to ingraft: then chop off the fig-tree by the trunk, and ſmooth the wound, and cleave it down the middle with a wedge: then pare the tops of the olive-tree on both ſides, as they ſtick to their mother, and ſo inſert them into the cleft of the fig-tree, and take out the wedge, and bind

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the ſmall branches carefully together, that they may not, by any force, be pulled away. Thus, in the ſpace of three years, the fig-tree grows up together, and takes with the olive-tree; and then, at length, the fourth year, when they are well co-united, you ſhall cut off the branches of the olive from their mother, as if they were layers. In this manner you ſhall graff every kind of tree on every kind of tree. But, before we make an end of this book, ſince we have in the former books treated almoſt of all the different ſorts of grafts, it is now a proper time to ſpeak of the *Cytiſus*, or Shrub-trefoil.

CHAP. XII.

Of the Cytiſus, *or Shrub-trefoil.*

IT is of great importance, that there be great abundance of the *Cytiſus*, or ſhrub-trefoil, in your land, becauſe it is moſt uſeful for hens, bees, goats, oxen alſo, and for all kind of cattle; becauſe they ſoon grow fat thereby, and it gives the ewes plenty of milk; as alſo, becauſe you may uſe it eight months for green fodder, and afterwards you may make uſe of it dry. Moreover, it quickly takes in any land whatſoever, altho' exceeding lean: it bears all kind of ill uſage without receiving any hurt. Yea, if women labour under ſcarcity of milk, the *Cytiſus*, or dry ſhrub-trefoil, muſt be ſteeped in water; and, when it has ſoaked throughly the whole night, the next day the juice of it muſt be ſqueezed out, and three *heminæ* of it mixed with a little wine, and ſo given them to drink: thus, both they themſelves ſhall enjoy good health, and their children ſhall be ſtrengthened with abundance of milk.

The *Cytiſus*, or ſhrub-trefoil, may be ſown either in autumn, about the fifteenth of *October*; or in the ſpring. After you have well manured the earth, make it into ſmall beds, and there ſow the ſeed of the ſhrub-trefoil, as you do that of common baſil. Then ſet the plants regularly in the ſpring, ſo that there may be ſpaces of four feet every way between them. If you have no ſeed, ſet the tops of the ſhrub-trefoil in the ſpring, and heap up well-dunged earth all round them. If rain does not come on preſently after, water them the next fifteen days; and hoe them as ſoon as they begin to put forth new leaves; and, after three years, cut it down, and give it to the cattle. Fifteen pounds weight of it green is enough for an horſe, and twenty pounds for

for oxen, and for other cattle in proportion to their ſtrength. Alſo Shrub-trefoil may be conveniently enough planted in branches before the month of *September*, becauſe it eaſily takes hold, and bears with ill uſage. If you give it dry, give it more ſparingly, becauſe it hath greater ſtrength; ſteep it firſt in water, and, after it is taken out, mix it with chaff, or ſtraw. When you have a mind to dry the *Cytiſus*, cut it down when its ſeed ſhall begin to grow big, and keep it a few hours in the ſun, till it fade; then dry it throughly in the ſhade, and ſo lay it up. It is enough for me thus far to have given precepts and directions concerning trees: now I am going, in the following book, to give an account of the care and management of cattle, and of the remedies proper for them.

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK SIXTH.

I Know, *Publius Silvinus*, that ſome prudent Huſbandmen have refuſed to take upon themſelves the care and management, either of greater or ſmaller cattle; and have moſt conſtantly ſlighted and rejected that art and occupation, as hurtful and contrary to their profeſſion: nor do I deny, that they did this with ſome reaſon, as if the purpoſe and aim of the Grazier were contrary to that of the Huſbandman, inaſmuch as the latter rejoiced moſt in ground that is exceedingly well manured, and perfectly clean and free from weeds; the former delights in that which is unplowed, and produces plenty of graſs; the one hopes for fruit from the earth, the other from his cattle. So it comes to paſs, that what the plower abominates, the Grazier, on the contrary, wiſhes for, *viz.* great plenty of graſs and herbs.

Nevertheleſs, in theſe ſo diſcordant deſires, there is a certain ſociety, or fellowſhip, or communion; becauſe it is cuſtomary to eat up the fodder which the ground produces, for the moſt part rather with domeſtic cattle, than with thoſe belonging to ſtrangers. And by plentiful dunging, which is owing to flocks and herds of cattle, the earth produces her fruits in great abundance: nor yet is there any country, provided there is corn produced in it, which does not receive great benefit and advantage from the help and aſſiſtance of all ſorts of great cattle, as well as of men. Hence labouring cattle alſo derived their name from the thing, being called *jumenta*, (helps) becauſe they eaſed and helped us in our labour, either by carrying loads, or by plowing. Therefore, as the antient *Romans* commanded, I myſelf alſo am of opinion, that we ſhould throughly underſtand the management of cattle, as well as the culture of lands. For, in a rural life, the buſineſs and oc-

occupation of Grazing is certainly moſt antient (1), and the ſame is alſo exceeding gainful: for which reaſon, the *Latin* words for *money* and *goods* ſeem to be derived from the word which ſignifies *cattle*, becauſe the antients poſſeſſed nothing elſe; and at this time, with ſome nations, this one kind of riches only is in uſe and eſteem; and now, with our farmers, there is no other thing whatſoever, that turns to better account, or yields a greater increaſe; as *M. Cato* alſo believed, who, when one aſked his advice, What part of Huſbandry he ſhould follow, whereby he might quickly be enriched? anſwered, If he would apply himſelf diligently to the buſineſs of a Grazier. And when he aſked him again, What he ſhould do next, in order to receive a plentiful enough income? affirmed, If he would apply himſelf to the buſineſs of Grazing but indifferently. But I am loth to tell (2) of ſo wiſe a man, what ſome authors relate; that when the ſame man aſked, What was the third gainful thing in Huſbandry? he aſſerted, If one would follow the buſineſs of Grazing, even but negligently; eſpecially conſidering, that the loſs which follows a ſlothful and ignorant Grazier, is greater than the advantage which redounds to one that is prudent and diligent. Nevertheleſs, as to the ſecond anſwer, there is no doubt but the produce of the cattle may do more than make an amends for the tolerable negligence of the owner. For which reaſon, we alſo, *Silvinus*, have committed this part of Huſbandry to poſterity, having followed the precepts of our anceſtors, with all the induſtry we have been capable of.

(1) *Jumenta.* Horſes and oxen are ſo called, becauſe they help and aſſiſt men in their labour. It ſeems to be an abbreviation of *juvamenta*, helps.

In all the antient poets, both *Greek* and *Latin*, the breeding and feeding of cattle is always honourably mentioned, as a buſineſs to which perſons of the greateſt character applied themſelves; and πολύμηλος, πολύαιξος, πολυβούτης, rich in ſheep and oxen, *&c.* were common epithets of the greateſt Captains, Leaders, and Governors. And the Poets, from the great riches that great plenty of wool produced, invented their fable of the Golden Fleece, *&c.* And *Varro*, who was a very great antiquarian, and with very good reaſon gathers the nature and origin of things from the names by which they were called, ſays, that the ſtory of the golden apples, ſo much celebrated by the antient Poets, ſignified only ſheep and goats, which *Hercules* brought out of *Africa* into *Greece*, which the *Greeks* called in their own tongue μῆλα· and he is of the ſame opinion with our author, that *pecunia*, and *peculium*, money, and all kinds of goods whatſoever, were ſo called from *pecus*, which ſignifies *cattle*.

(2) *Piget dicere.* Here *Columella* blames *Cato* for aſſerting, that even bad feeding of cattle would not fail to bring ſome gain to a Grazier. But *Cato's* anſwer ſignifies only the great eſteem he had of cattle, and how great gain might be made by breeding them. *Plin. Nat. Hiſt. lib.* xviii. *cap.* 5. mentions the two firſt queſtions and anſwers, but takes no notice of the third. *Tully*, in his Offices, *lib.* ii. 25. takes notice of all the three, and adds a fourth way of being rich, *viz.* that of Tillage.

There-

Therefore there are two kinds of four-footed beaſts, with one kind of which we furniſh ourſelves in order to take them into a copartnerſhip of our labours, as the ox, the mule, the horſe, the aſs; the other we provide ourſelves with for our pleaſure, for our guard and protection, and for the ſake of the yearly profit they bring us; as the ſheep, the goat, the hog, the dog. We ſhall firſt ſpeak of that kind, which we make uſe of as copartners in our labour; nor is there any doubt but (as *Varro* (2) ſays), the ox ought to be honoured and reſpected above all other cattle, but eſpecially in *Italy*, which is ſuppoſed to have derived its name from this animal, becauſe, of old, the *Greeks* called bulls Ἰταλούς; and in that city, where a male and a female of this kind of cattle marked out the bounds with a plough, when they were going to build the walls: alſo, becauſe at *Athens* the ox is ſaid to be the miniſter of *Ceres* and *Triptolemus* (3): and becauſe he has obtained a place in the heavens amongſt the brighteſt ſtars: moreover, becauſe he is ſtill man's moſt laborious companion in Huſbandry, and for whom they had ſo great a veneration among the antients, that it was as capital a crime to have killed an ox, as a citizen. With him, therefore, let us begin the work we have promiſed.

CHAP. I.

Of buying Oxen, and of their Shape and Make.

IT is not an eaſy matter for me to tell, what things are to be obſerved, and what to be avoided, in buying of oxen; ſeeing cattle derive both the habit of their body, and the diſpoſition of their mind,

(2) *Varro*, in his ſecond book of Husbandry, ſays, that if the antients had not had a great eſteem for cattle, their aſtronomers would not, in deſcribing the heavens, have called ſome ſigns by their names; ſo that ſome of them began the twelve ſigns with the two chief names of cattle, *Aries* and *Taurus*, the Ram and the Bull, preferring them to *Apollo* and *Hercules*, which ſome thought were intended by *Gemini*, tho' commonly it is thought, that *Caſtor* and *Pollux* were ſignified thereby; and, not content with the ſixth part of the ſigns being called by their names, they added *Capricornus*, in order to have the fourth part; and, that ſeveral places, both by ſea and land, retain their names, as the *Boſphorus* and *Ægean* ſeas; the mountain *Taurus*, &c. and, that ſeveral eminent men had their names from different ſorts of cattle, as *Porcius*, *Ovinius*, *Caprinius*, *Taurus*, *Vitulus*, &c. all which, and many other things, ſhew the great regard they had for cattle.

(3) *Cereris & Triptolemi miniſter. Ceres*, the goddeſs of corn and tillage: ſhe nurſed *Triptolemus* the ſon of *Celeus* King of *Athens*, and taught him Husbandry. The poets feign, that he travelled over the whole earth, in order to teach men Husbandry. Probably, he wrote of Husbandry, and publiſhed his books to the world, which gave occaſion to the fable.

and the colour of their hair, from the condition of the country, and the conſtitution of the climate. The *Aſiatic* have one form, the *Gallican* another, and thoſe of *Epirus* a third. Nor is there only a diverſity in thoſe of the Provinces, but, in *Italy* itſelf alſo, they differ in its ſeveral parts. *Campania*, for the moſt part, breeds white and ſlender oxen; nevertheleſs, they are not unfit for labour, and for cultivating their native ſoil. *Umbria* produces ſuch as are huge, and of a white colour; the ſame produces alſo ſuch as are red, and they are no leſs to be approved for their temper and diſpoſition, than for their bodies. *Hetruria* and *Latium* produce ſuch as are compact, but ſtrong for labour: the *Apennine* mountains, ſuch as are exceeding hardy and ſturdy, and which endure any kind of hardſhip, but not comely nor beautiful to look upon. Since in theſe there is ſo great diverſity and variety, the Plower, in buying bullocks, ought to obſerve ſome common and certain precepts as it were: and theſe *Mago* the *Carthaginian* has tranſmitted and delivered to us, ſo as we ſhall hereafter relate them.

Such oxen are to be purchaſed as are young, ſquare, with huge members, lofty horns, and ſomewhat blackiſh and robuſt, with a broad and curled forehead, hairy rough ears, black eyes and lips, wide noſtrils, a camoys noſe, a long and brawny neck, large dewlaps, and almoſt hanging down to their knees, a great breaſt, vaſt ſhoulders, a capacious belly, and, as it were, great with young, extended ſides, broad loins, a ſtraight and even back, or even ſomewhat ſubſiding, round buttocks, with compact, well-ſet, and ſtraight legs, but rather ſhorter than longer, and not with big and ill-ſhaped knees, with great hoofs, and exceeding long briſtly tails, and the hair of their whole body thick and ſhort (1), of a red or dark colour, and exceeding ſoft to the touch.

(1) *Piloſiſque, corpore denſo brevique.* In this laſt paragraph I have followed the correction of *Pontedera*, the errors of the text being very manifeſt, as *Geſnerus* and others have obſerved; for oxen with thick and ſhort bodies are not at all approved. *Varro, lib.* ii. 5. ſays, *Let theſe cattle be well made, with ſound, oblong, and large members. Palladius, lib.* iv. 11. *Let oxen have ſquare and huge limbs, and a firm and ſolid body.* And *Columella*, in this very chapter, directs us to purchaſe *young oxen that are ſquare, and have huge limbs.* So that it is very probable the true reading is, *caudis longiſſimis & ſetoſis, pilo totius corporis denſo ac brevi.*

CHAP.

CHAP. II.

Of breaking of Oxen.

CALVES of ſuch a character you muſt accuſtom, while they are yet young, to be handled and tied to their mangers, that there may be very little labour, and leſs danger, in breaking of them. But I am of opinion, that ſteers ought not to be broken, either before their third, or after their fifth year, becauſe that age is, as yet, too tender and young, and this is now exceeding ſtiff and ſturdy. But it is proper, that thoſe, which are caught, and taken wild out of the herd, ſhould be tamed and broken in this manner:

Firſt of all, let a ſpacious ſtable be prepared, where the perſon, that breaks them, may eaſily go about his buſineſs, and from whence he may retire without danger. Let there be no narrow ſtrait places before the ſtable, but either a field, or a wide open way, that, when the bullocks are brought out, they may have a free excurſion, that ſo, when they are timorous and ſkittiſh, they may not intangle themſelves with trees, or any other thing lying in their way, and receive hurt. Let there be large cribs in the ſtable, and above them tranſverſe planks, faſtened in the manner of yokes, ſeven feet high from the ground, to which the ſteers may be tied. Then make choice of the morning of a day, which is free from ſtorms and religious ceremonies, when you may begin the breaking of your cattle, and bind the horns of the bullocks with hempen ropes; but let the ropes, wherewith they are at firſt caught, be wrapt about with wooly ſkins, that their tender foreheads under their horns may not be hurt. Then, after you have ſeized the young ſteers, bring them to the ſtable, and tie them to the ſtakes, ſo that they may be at their eaſe, and have a little room to move in; and let them be a little ſpace diſtant from each other, that, in ſtruggling, the one may not hurt the other. If they are too fierce, ſuffer them to give vent to their fury for one day and a night; and, as ſoon as they have aſſwaged and repreſſed their anger, let them be led out in one's hand, ſo that there may be both ſomebody before them, and ſeveral behind them, who may follow them, and keep them in with ropes; and let one go before with a willow cudgel, and, with gentle blows, from time to time reſtrain and ſtop their ſudden ſallies and efforts. But, if the oxen are gentle and quiet, you may lead them forth before the evening, even the very ſame day you tied them to the ſtake, and teach them to walk a thouſand

paces quietly and without fear. After you have led them home, tie them again close to the ſtakes, ſo that they may not be able to move their head. Then afterwards come up to the oxen, when they are tied, neither behind them, nor ſideways, but right before them, gently, and with a ſoothing and fawning voice, that they may accuſtom themſelves to look to you when you come up to them. Then rub their noſtrils, that they may learn to ſmell a man. Afterwards alſo it is proper to handle all their ſkin, and to ſprinkle it all over with pure wine, that they may become more familiar with him that tends them, or labours with them; and to put your hand alſo under their belly, and upon their thighs, that afterwards they may not be frightened, when they are touched in this manner, and that the tikes, which commonly ſtick to their thighs, may be taken away. Therefore, when the perſon that breaks them is doing this, he ought to ſtand at a ſide, that he may be out of the reach of their heels. After theſe things, having opened their jaws, draw out their tongue, and rub their palate all over with ſalt, and put down their throat with a ſlice a pound of ſops dipped in very ſalt melted fat; and pour into their jaws, thro' an horn, a *ſextarius* of wine each; for, by theſe blandiſhments, they grow tame almoſt in three days time, and receive the yoke the fourth day, to which a bough of a tree is tied, and drawn inſtead of the beam of the plough; and ſometimes ſomething of weight is joined to it, that, by their greater effort, their patience of labour may be tried.

After experiments of this ſort, they muſt be yoked to an empty cart, and gradually led out to a greater diſtance with their loads. Being thus throughly broken, let them be preſently inſtructed and bred up to the plough, but in manured land, that they may not preſently dread the difficulty of the work, nor bruiſe their necks, that are but tender as yet, with breaking up unplowed land, which is very hard and difficult. But I gave directions in the firſt book, after what manner a Ploughman may train up an ox in plowing. You muſt take care, that the ox, during the time you are breaking him, may not touch any perſon either with his horn, or his heel; for, unleſs theſe things are prevented, he can never be freed from theſe vices, even tho' he be throughly broken.

But we direct, that theſe things be done thus, in caſe you have no veteran cattle at hand; for, if there are any at hand, there is a ſafer and more expeditious way of breaking them, which we follow in our own lands: for, when we accuſtom a bullock to the cart, or the plough, we yoke one of the ſtrongeſt and gentleſt of our broken oxen with one that is not broken, who may both pull him back when he makes too great haſte, and lead him on when he lingers or ſtops. But, if we do

not

not grudge the being at the trouble to make a yoke, wherein three oxen may be yoked, we ſhall, by this contrivance, gain our end ſo far, that even ſtubborn headſtrong oxen will not refuſe the heavieſt loads; for, where a ſlow or reſtiff bullock is yoked in the middle between two veteran oxen, and, being put into the plough, is forced to till the ground, he is no more left at liberty to refuſe and diſobey what is commanded; for, whether he falls into a fury and rage, and leaps out on one ſide, he is kept in his place at the pleaſure of the other two; or whether he ſtands ſtill, when the other two go on, he alſo obeys; or, if he endeavours to lie down, he is held up and drawn along by the ſtronger; by which means, he is forced on every ſide to lay down his ſtubbornneſs, and, with very few ſtrokes, is brought to endure labour.

There is alſo an ox of a ſofter kind after breaking, who lies down in the furrow. I am of opinion, that he muſt be cured, not by cruelty, but by reaſon; for they who judge, that this vice is beſt removed with goads, or fire, and other torments, are ignorant of true reaſon, becauſe their obſtinate ſtubbornneſs, for the moſt part, wearies the perſon that is enraged againſt them, and that uſes them cruelly; for which reaſon, it is better to cure an ox, that lies down, with hunger and thirſt, without tormenting his body; for his natural deſires affect him more vehemently than blows. Therefore, if an ox has lain down, the moſt effectual way is to bind his feet with ropes, ſo that he may neither be able to ſtand, or go forward, nor to feed. By doing of which, being forced with hunger and thirſt, he lays down his ſluggiſhneſs; which nevertheleſs is very rare in our own country cattle. And every ox, bred in our own country, is better than one that is a ſtranger; for he is neither tempted by the change of water, nor of fodder, nor of climate, nor infeſted with the ſtate and condition of the country, as that ox is, which is brought from even and champain places into ſuch as are mountainous and rugged; or from mountainous places into a champain country. Therefore, when we are forced to bring oxen from a diſtant country, we muſt alſo take care, that they be taken from ſuch places in their own country, as are like to thoſe into which they are brought. We muſt alſo obſerve, that one that is unequal in bulk of body, or in ſtature, or in ſtrength, be not yoked with one that is ſtronger; for both theſe things prove deſtructive to the weaker.

The manners, or temper and diſpoſition, of this cattle are moſt approved, which are nearer to the gentle and peaceable, than to the violent and fierce, but not ſluggiſh and dull; which are afraid of loud bluſtering words, but, in confidence of their ſtrength, are not ſtartled at what they either ſee or hear, nor afraid to go into rivers, or paſs bridges;

bridges; which eat up a vaſt quantity of food, but are ſlow in chewing it; for theſe digeſt better: and therefore, ſuch as eat at their leiſure and conveniency, preſerve the ſtrength of their body without leanneſs, better than thoſe which eat in a hurry. But it is as great a fault, in one that has the care of oxen, to make an ox fat, as it is to make him lean; for the bulk and plight of body in labouring cattle ought to be moderate, and fit for their buſineſs, robuſt in nerves and muſcles, not ſwelled with fat, that they may neither be weighed down and wearied with the bulk of their own hide, nor with the drudgery of their work. But, ſince we have given an account of ſuch things as ought to be obſerved in buying and breaking of oxen, let us now give directions for managing and keeping them.

CHAP. III.

Of the Care that is requiſite in keeping of Oxen, and of the Food that is proper for them.

IN hot weather oxen muſt abide in the open air, and, in cold, within-doors: therefore, for their winter ſtabling, ſtubble muſt be prepared, which, being cut down in the month of *Auguſt*, within thirty days after the harveſt is removed, ought to be put up in ſtacks. The cutting it down is of great advantage, both to the cattle, and the land. The corn-fields are freed from briars and thorns, which, being cut down in the ſummer-time, about the time that the Dog-ſtar riſes, periſh to the very roots, and, being laid under the cattle's litter, make a great deal of dung. When we have thus taken care of theſe things, then we muſt both make proviſion of all kinds of fodder, and be careful, that the cattle don't grow lean through ſcarcity or want of food.

But there is not one method only of feeding oxen rightly; for, if the great plenty of the country affords green fodder, nobody doubts but this kind of food is to be preferred to all other; which, nevertheleſs, does not happen, but in places that are well watered, or where the dew falls in great abundance. Therefore, in theſe very places, the greateſt advantage and conveniency is, that one Ploughman is ſufficient for two yoke of oxen, which, on the ſame day, do either plow, or go out to paſture by turns. In drier lands, the oxen muſt be fed at their cribs; and their food is given them according to the ſtate and condition of the country; and nobody doubts but vetches and chichlings, as alſo meadow-

dow-hay tied up in bundles, are the beſt food for them. We maintain and ſupport our herds leſs commodiouſly with chaff or corn-ſtraw, which every-where are a ſupport to them, and, in ſome countries, the only one they have. Chaff or ſtraw of millet is moſt approved, then that of barley, and next that of wheat alſo. But, beſides theſe, they give barley to labouring oxen, which perform the full taſk of labour.

But fodder is diſpenſed to oxen, according to the ſeaſons of the year. In the month of *January*, it is proper to give each of them four *ſextarii* of bitter vetches, bruiſed and ſoaked in water, and mixt with ſtraw or chaff; or one *modius* of ſoaked lupins; or half a *modius* of ſoaked chichlings; and, over and above theſe, ſtraw or chaff in abundance. We may alſo, if there is a ſcarcity of pulſe, mix with their ſtraw or chaff waſhed and dried grape-ſtones, that are taken out of the ſmall wine, which is laſt made. Nor is it to be doubted, but it is better to give them theſe with their huſks, before they are waſhed; for they have the ſtrength both of food, and of wine, and make the cattle both ſleek and fair, and chearful and plump. If we keep them from grain, a fodder-baſket full of dry leaves of twenty *modii* is ſufficient, or thirty pound weight of hay; or, if we do not with-hold corn from them, a *modius* of green laurel, and of ever-green oak-leaves. But to theſe you add maſt, if the plenty of the country will permit it; which, unleſs it be given to ſatiety (1), breeds the ſcab. Alſo you may give them half a *modius* of bruiſed beans, if the great crop you have of them make it turn to your advantage.

In the month of *February*, for the moſt part, the ſame kinds of food ſuffice. In the months of *March* and *April*, ſome addition ought to be made to the weight of hay, becauſe they are then tilling the ground; but it will be enough, if you give them forty pound weight each. Nevertheleſs, from the thirteenth of the month of *April*, to the fifteenth of *June*, it is right to cut green fodder for them. Alſo, in colder places, the ſame thing may be done to the firſt of *July*; from which time, to the firſt of *November*, during the whole ſummer, and after that in autumn, let them be ſatiated with leaves; which nevertheleſs are not uſeful, till they be fully ripened with ſhowers, or continual dews. The elm-tree-leaf is moſt approved; afterwards that of the aſh; and next that of the poplar-tree. Thoſe of the ever-green oak, common oak, and laurel or bay-tree, are leaſt eſteemed; but, after ſummer, they are neceſſary, when the others fail. You may alſo give them fig-

(1) *Quæ, niſi ad ſatietatem datur, ſcabiem parit.* Some think, that the true reading is, *ſi ad ſatietatem datur*, becauſe afterwards he limits the quantity of maſt to be given, mixed with other fodder.

tree-

tree-leaves very ſafely, if you have plenty of them, or if it be expedient to ſtrip the trees. Nevertheleſs the ever-green oak-leaf is better than that of the common oak, but of that kind which has not prickles; for cattle refuſe and diſlike that, as they do the juniper-tree, becauſe of their prickles. In the months of *November* and *December*, during the ſeed-time, you muſt give the ox as much as he deſires, and has an appetite for. Nevertheleſs, for the moſt part, a *modius* of maſt to each of them, and chaff or ſtraw given them till they be ſatiated, is ſufficient; or a *modius* of ſteeped lupins; or ſeven *ſextarii* of bitter vetches, ſprinkled with water, mixt with chaff; or twelve *ſextarii* of chichlings, ſprinkled in like manner with water, and mixed with chaff; or to each of them a *modius* of grape-ſtones, if to theſe be added, as I ſaid above, a large quantity of chaff; or, if you have none of theſe, forty pound weight of hay by itſelf.

CHAP. IV.

Of the Diſeaſes of Oxen, and of their Remedies.

BUT it will be of no advantage, that cattle have food to the full, unleſs they be aſſiſted with all diligence, that they may be of a wholſome body, and preſerve their ſtrength; both which are maintained, by giving them, for three days, a large doſe of a medicine, which is compounded of an equal weight of bruiſed lupins, and of cypreſs-tree, and with water kept for one night in the open air; and this ought to be done four times in the year, about the latter end of the ſpring, ſummer, autumn, and winter. Oft-times alſo feebleneſs, and want of ſpirits, and nauſeating, are removed, if you put an hen's egg raw, without breaking it, into their chops faſting; and, the day after, bruiſe cloves of *Cyprian* or common garlick (1) with wine, and ſo pour it into their noſtrils: neither do theſe remedies only make them healthful.

Many alſo mix a large quantity of ſalt with their fodder; ſome have given them horehound with oil and wine; ſome infuſe fibres of leeks; others grains of frankincenſe; others the herb ſavine, and rue, in pure wine; and give them theſe medicines to drink. Many cure their oxen

(1) *Spicas ulpici.* Both *Pliny* and our author ſay, that this *ulpicum* is called *Cyprian* garlick. *Pliny* ſays the *Greeks* alſo called it *antiſcorodon*; but *Columella* ſays they called it *aphroſcorodon.* See *lib.* ix. *c.* 3. for a further deſcription of it.

with

with ſtalks of the white vine (2), and huſks of the bitter vetch. Some bruiſe the ſkin of a ſerpent, and mix it with wine. Mother of thyme, bruiſed with ſweet wine, is alſo a remedy for them; and ſquills cut ſmall, and ſteeped in water. All which foreſaid potions given them for three days, three *heminæ* every day, purge their belly, and, after removing their diſtempers, repair their ſtrength. Nevertheleſs the lees of oil are reckoned the moſt ſalutary, if you mix an equal quantity of water with them, and accuſtom the cattle to them by degrees; but they cannot be given them immediately; but firſt their food is ſprinkled with them, then a ſmall quantity of them is mixed with their water, and, ſoon afterwards, you mix an equal quantity of both, and give them as much as they are able to drink.

CHAP. V.

Of ſuch Things as bring the Plague upon Cattle, and what Remedies are to be applied.

BUT it is of no advantage at any time, but leaſt of all in ſummer, to rouſe the oxen ſo as to make them run; for this either gives them a looſeneſs, or raiſes a fever. You muſt alſo beware, that neither a ſow nor a hen creep into their cribs; for that which falls from them, being mixed with their fodder, is certain death to oxen; and that eſpecially, which a ſick ſow throws up and vomits, is enough to raiſe the plague: and, when this lights upon an herd, you muſt preſently change the climate, and, having diſtributed the cattle into ſeveral diviſions, you muſt go with them into regions that lie at a great diſtance; and the diſeaſed muſt be ſo ſeparated from the ſound, that not ſo much as one may come among them, which may, with the contagion, infect the reſt. Therefore, when they are removed to a great diſtance, they muſt be brought into thoſe places wherein no other cattle are fed, leſt, by their coming, they bring the plague alſo among them.

But diſeaſes, altho' peſtilential, muſt be conquered and repelled by exquiſite remedies. Then the roots of *allheal* and *eringo* muſt be mixed with *fennel-ſeeds*, and ſprinkled with muſt boiled into a third of the

(2) *Vitis alba.* *Pliny* ſays, that this plant is by ſome called *white bryony*. The *Greeks* call it by many other names, as he tells us, *lib.* xxiii. *cap.* 1. It ſhoots forth with many ſprays, with long joints and knots, and jagged leaves and tendrils, like a vine; of which the foreſaid author gives a diſtinct account in the fore-mentioned place.

firſt quantity, and with wheat-flour and boiling water; and with this medicine the ſick cattle muſt be drenched. Then you make a potion with an equal quantity of caſſia, myrrh, and frankincenſe, and a like quantity of the blood of a ſea-tortoiſe, with three *ſextarii* of old wine, and ſo pour it into their noſtrils. But it will be ſufficient, if you give the medicine itſelf divided into equal doſes of one ounce and an half, with wine, for three days.

We have alſo known, that a ſmall root, which Herdſmen call *conſiligo* (lungwort) (1), has been a preſent remedy. It grows in great plenty in the *Marſian* mountains, and is exceeding wholſome for all kinds of cattle. They dig it up with the left-hand before the riſing of the ſun; for they believe it has greater virtue, when it is ſo gathered. The account they give of the way of uſing it is this: They draw a round line with a braſen awl upon the broadeſt part of the ear, ſo that, when the blood iſſues out of it, there may appear a ſmall circle drawn like the letter O. When this is done, both in the inſide and on the upper part of the ear, they pierce through with the ſame awl the middle part of the ſmall circle which they have deſcribed, and inſert the foreſaid ſmall root into the hole they have made; which when the freſh wound has taken hold of, it holds it ſo, that it cannot ſlip out. Then all the ſtrength of the diſeaſe, and the peſtilential poiſon, is drawn out into that ear, till that part, round which the line was deſcribed with the awl, mortifies and falls out; and, by the loſs of that very ſmall part, the head is preſerved. *Cornelius Celſus* alſo orders us to pour into them through their noſtrils the leaves of miſſelto bruiſed with wine. Theſe things muſt be done, if all the cattle in general are ſick, and thoſe moreover, if any one in particular is out of order.

(1) *Conſiligo.* The antient ruſtics called this herb by this name, becauſe they found it frequently growing among a ſort of wheat they called *ſiligo*. *Vegetius* ſays, that it was called *pulmonaria*, lungwort, becauſe it was a ſpeedy relief to diſeaſes of the lungs in cattle. Father *Hardouin* ſays, that in *France* it is commonly called *pomelée*, which ſeems to be a corruption of *pulmonaria*; and that ſome herbaliſts call it *pata leonis*. See *Ruellius*, *lib.* ii. *p.* 488. The *Marſian* mountains, where it was firſt found, are in that part of *Italy*, which is now called *Ducato de Marſi*, in the kingdom of *Naples*, and bordering upon the Pope's territories.

CHAP.

CHAP. VI.

Of Remedies to be applied to Oxen, that are diſordered with Indigeſtion.

THE ſigns of crudity are frequent belchings, and rumbling noiſe in their belly, nauſeating of their food, contraction or ſtiffneſs of their nerves, dull heavy eyes; becauſe of which the ox neither chews his cud, nor licks or wipes himſelf with his tongue. Two *congii* of warm water, and, preſently after, thirty ſtalks of colewort, moderately boiled, and dipped in vinegar, and given them, will cure them; but they muſt, for one day, abſtain from other food.

Some keep the cattle ſhut up in the houſe, that they may not feed. Then they mix four pound weight of the tops of the maſtic, and of the wild olive-tree, and a pound of honey, bruiſed together, with a *congius* of water, which they keep for one night in the open air, and ſo pour it into their chops. Then, after the ſpace of one hour, they lay before them four pounds of bitter vetches ſteeped in water, and keep them from all other drink. This ought to be done for the ſpace of three days, till all the cauſe of their languor be diſcuſſed; for, if the crudity be neglected, both an inflation of their belly, and a greater pain in their bowels, follow upon it, which neither ſuffers them to take their food, nor to ſtand in their place; but draws groans from them, and forces them to lie down frequently, and toſs their heads, and move their tails, oftener than uſual. A ſure remedy for this is to bind exceeding faſt with a cord that part of their tail, which is next to their buttocks, and to pour a *ſextarius* of wine, with an *hemina* of oil, down their throat, and ſo to drive them for fifteen hundred paces as faſt as they can go.

If the pain ſtill continues, you muſt cut their hoofs all round; and, having anointed your hand, put it into their anus, and pull out the dung, and then drive them again, ſo as to make them run; or, if this thing has had no good effect, they bruiſe dry wild figs, and give them with three-fourths of a *ſextarius* of warm water. When neither this medicine has ſucceeded, they chooſe two pounds of wild myrtle-tree-leaves, and mix them with as many *ſextarii* of warm water, and pour it into their chops with a wooden ladle, and ſo they let them blood under the tail, and, when they have bled enough, they ſtop the blood with a ruſh-binding. Then they drive the cattle again very hard, till they be out of breath. There are alſo thoſe following remedies

before letting of blood: They mix three ounces of garlick, bruiſed in a mortar, with three *heminæ* of wine; and, after they give them this potion, they force them to run: or they bruiſe two ounces of ſalt with ten onions, and, having mixed well-boiled honey with them, they make them into ſuppoſitories, and adminiſter them, and then they drive the ox full ſpeed.

CHAP. VII.

With what Remedy the Pain of the Belly, and of the Inteſtines of Cattle, may be quieted.

THE pain, both of the belly and the inteſtines, is aſſwaged with the ſight of ſwimming fowls, eſpecially of a duck, which, if an ox, which has a pain in any of his inteſtines, looks upon, he is quickly freed from the torment. The ſame duck more effectually cures mules and the horſe kind with her aſpect: but ſometimes no remedy is of any benefit. Now follows the diſtemper of the gripings or wringing of the guts, of which a bloody and mucous looſeneſs is the ſign. The remedies are fifteen cypreſs-cones, and as many galls, and of the weight of both theſe a quantity of very old cheeſe, which being bruiſed into one maſs, they mix four *ſextarii* of rough wine with them, and diſpenſe the ſame to them in equal quantities for four days; nor let the green tops of the maſtich, myrtle, and wild olive-trees, be wanting. A looſeneſs waſtes their body, and their ſtrength, and makes them unfit for labour. When theſe things happen, the ox muſt be reſtrained from drinking for three days; and the firſt day he muſt be kept from food: but, preſently after, you muſt give him the tops of the wild olive-tree, and the reed, alſo maſtich, and myrtle-berries. Nor muſt he have liberty to drink water but exceeding ſparingly.

There are ſome who give them a pound of the ſtalks or ſhoots of a tender young laurel or bay-tree, with an equal quantity of ſteeped ſouthernwood, with two *ſextarii* of warm water, and ſo pour it down their throat; and throw the ſame fodder before them as we mentioned above. Some toaſt two pounds of grape-ſtones, and ſo bruiſe them, and, with as many *ſextarii* of rough wine, give them as a medicine to drink, and keep them from all other moiſture whatſoever; and they alſo throw the tops of the foreſaid trees before them. But, if neither the violent looſeneſs ſtops, nor the pain of the belly and inteſtines abates, and

and if he refuſes his meat, and if his head is ſo weighty, that he cannot bear it up, and tears flow from his eyes, and rheum from his noſtrils, oftener than uſual, let the middle of his forehead be burnt to the bones, and his ears cut with a knife. But it is proper to rub with ox's urine the wounds that are made with fire, while they are healing; but thoſe that are cut with a knife, are better cured with pitch and oil.

CHAP. VIII.

Of a diſtempered Growth or Swelling of the Tongue.

Diſtempered growings or ſwellings of the tongue, which the Farriers call *frogs*, uſe alſo to occaſion loathings of their food. They cut theſe off with a knife, and rub the wounds with ſalt and garlic bruiſed together, till the rheum is provoked, and runs out of their mouth. Then they waſh their mouth throughly with wine, and, after the ſpace of one hour, they give them green herbs and leaves, till the wounds that are made heal up, and form a ſcar. If the ox has neither ſwellings or puſhes in his tongue, nor a violent looſeneſs, and, notwithſtanding, has no appetite for his meat, it will be of benefit to pour into him, through his noſtrils, garlic and oil beaten together in a mortar, or to rub his chops with ſalt or ſavory; or to anoint the ſame part with bruiſed garlic and a pilchard. But theſe things are proper, if he only have a loathing.

CHAP. IX.

Of the Fever of Oxen.

IT is proper, that an ox, that has a fever, ſhould be kept from food for one day, and then the next day be let a little blood under the tail, when he is faſting; and that, after the ſpace of one hour, thirty ſtalks of colewort or cabbage of a moderate bigneſs, dipped in oil, and pickle made of ſalt fiſh, be put down his throat in the manner of a drench; and that this food be given him five days faſting; moreover, that the tops of the maſtich, or of the olive-tree, or the tendereſt leaves of any ſort, or the young leaves and ſhoots of vines, be thrown before

before him; as alſo, that his lips be wiped with a ſponge; and that cold water be given him three times a day to drink: which phyſic ought to be given him in the houſe, and the ox not to be let out, before he recovers his health. The ſigns that he is in a fever are, dropping tears, a great heavineſs, and hanging down of his head, compreſſed eyes, the *ſaliva* flowing from his mouth, drawing his breath more ſlowly than ordinary, and with a certain impediment, and ſometimes with a groan.

CHAP. X.

Of the Cough of Oxen.

A Freſh cough is beſt diſcuſſed with a drench of barley-meal. Sometimes graſs cut ſmall, and bruiſed beans mixed with it, are more effectual. Alſo they mix two *ſextarii* of lentils, taken out of their hulls, and ground very ſmall, with warm water; and, having made a potion therewith, pour it into them through an horn. Two pounds of hyſſop, macerated, or ſteeped in three *ſextarii* of water, cure an old cough; for this medicine is bruiſed, and given, with four *ſextarii* of lentils ground ſmall, as I ſaid, in the manner of a drench; and then the hyſſop-water is poured into them through an horn. Alſo the juice of a leek with oil, or the fibres themſelves bruiſed with barley-meal, is a remedy for it. The roots of the ſame carefully waſhed, and beaten in a mortar, with wheat-meal without bran, and given him faſting, remove the oldeſt cough. The bitter vetch, without huſks, ground with toaſted barley, in equal quantity, and put down their chops, in the manner of a drench, has the ſame effect.

CHAP. XI.

Of Remedies for an Impoſtume.

IT is better to open an impoſtume with a lancet, than with a medicine; and when the *ſinus* itſelf, which contained it, is emptied, you waſh it with an ox's warm urine, and bind it up with linaments ſoaked in liquid pitch and oil; or, if that part cannot be bound up, you muſt drop

drop ox's or goat's tallow into it from a burning-hot plate of metal. Some, after they have burnt the part affected, waſh it with ſtale urine; and ſo anoint it with liquid pitch, and old hogs-lard, or axle-tree greaſe, melted together in equal quantities.

CHAP. XII.

Of the Remedy to be applied to an Ox that is lame.

THE blood falling down to the feet occaſions lameneſs. When this happens, you muſt preſently examine the hoof, and by touching it you know its burning heat: nor does the ox ſuffer the affected part to be vehemently preſſed. But, if the blood be as yet in the legs above the hoofs, you may diſcuſs it by frequent friction; or, when this has been of no benefit, it is removed by ſcarification. But, if it is already in the hoofs, you muſt open it gently with a knife between the two hoofs. Afterwards you apply linaments ſoaked in ſalt and vinegar, and then put a ſhoe of *Spaniſh* broom on his foot; and you muſt take great care, that he do not put his foot in water, and that he be kept in a dry ſtable.

This ſame blood, unleſs it be let out, will breed putrified matter; and, if it turns to a ſuppuration, it will be long before it be throughly cured: and it is brought to a perfect cure, firſt by cutting it round with a knife, and cleanſing it throughly, and then by thruſting tentsin to it wet with vinegar, ſalt, and oil, and afterwards with ſtale hogs-lard, or axle-tree greaſe, and goats-tallow, boiled together in equal quantity. If the blood is in the lower part of the hoof, you muſt cut the extreme part of the hoof itſelf to the quick, and ſo let it out; and after you have wrapt up the foot with linaments, ſecure it with *Spaniſh* broom from receiving any hurt. It is not proper to open the middle of the hoof on the lower part, unleſs the ſuppuration is already begun in that place. If he halts, and is lame from a pain in his nerves and ſinews, his knees, hams, and legs, muſt be rubbed with oil and ſalt, till he be cured. If his knees be ſwelled, they muſt be fomented with warm vinegar; and you muſt put linſeed, or bruiſed millet, ſprinkled with honey-water, upon them. And it is right alſo to dip ſponges in boiling water, and then ſqueeze the water out of them, and anoint them with honey, and apply them to his knees, and ſurround them with bandages.

But,

But, if there is ſome humour under the ſwelling, you muſt put leaven, or barley-meal boiled in raiſin-wine or honey-water, upon it: and, when the ſuppuration is ripe, you muſt open it with a lancet; and, after you have let it out, you cure it with linaments, as I taught you before. The root of the lily, or a ſquill with ſalt, or the blood-herb, which the *Greeks* call *Polygonon* (1), or horehound, may (as *Cornelius Celſus* directs) cure ſores which have been laid open with the lancet. But almoſt every pain of the body, if it be without a wound, is better diſcuſſed, when it is freſh, with fomentations; but an old pain is beſt removed with burning, and dropping burnt butter, or the fat of goats, upon it.

CHAP. XIII.

Of the Remedies for curing the Scab, and the Bite of a mad Dog or a Wolf, and alſo for curing Hidebinding.

THE ſcab is diminiſhed with rubbing it hard with bruiſed garlic; the bite of a mad dog is cured with the ſame remedy, the which nevertheleſs is equally well cured, by putting a piece of old ſalted fleſh or fiſh upon the wound. And there is another more ſpeedy and effectual medicine for the ſcab. Wild marjoram and ſulphur are bruiſed together, and boiled in lees of oil mixed with oil, water, and vinegar: then, when they are lukewarm, bruiſed ſciſſile alum (1) is ſprinkled upon them. This medicine, if they be anointed with it in the burning heat of the ſun, will be of exceeding great benefit.

Bruiſed galls are a remedy for ulcers. The juice of horehound with ſoot is not leſs effectual. There is a plague that is troubleſome to ox-cattle; ruſtics call it *Hidebinding*; when the ſkin ſticks ſo cloſe to their back, that, when they take hold of it with their hands, they can-

(1) *Polygonon. Plin. Hiſt. Nat. lib.* xxvii. *cap.* 12. ſays, that this herb has leaves like rue, and ſeed like graſs, and that it has its name from the multitude of its ſeeds: it is alſo called *Proſerpinaca*. Father *Hardouin* ſays, that the *French* call it *Renouée*, from its frequent knots and joints.

(1) *Alumen ſciſſum*, or *ſciſſile*, as *Cornelius Celſus* calls it: the *Greeks* call it *ſchiſton*. It is a kind of alum, as *Dioſcorides* ſays, which is not cloſely compacted and condenſed into a maſs, nor appears in ſolid pieces and chips, but which opens and divides itſelf, and ſeparates into certain hoary capillaments, from which ſome call it *trichitin*, or *capillary alum*. *Plin. Nat. Hiſt. lib.* xxxv. *cap.* 16. ſays, that it is made of the ſtone they call *chalcitis*, copper-ſtone, which was firſt found in *Cyprus*: he ſays, it is the ſweat of that ſtone coagulated into a froth. I ſee ſome call it *flaky alum*.

not remove it from their ribs. This thing happens by no other means, but either by the ox's being reduced to a lean habit of body by ſome kind of languor or other; or by his growing cold after he has been in a ſweat in doing his work; or by his being wet with rain, when under his load. And, becauſe theſe things are pernicious, you muſt take care, that when the oxen return from their work, they be ſprinkled with wine, while they are yet all in a heat, and breathe ſhort, and that lumps of fat be put into their chops. But if the foreſaid diſeaſe cleaves to them, it will be of benefit to boil laurel throughly, and, while it is warm to foment their backs with it, and preſently to rub them with much oil and wine; and that is beſt done in the open air, when the ſun is very hot. Some mix a maſh of ſqueezed or preſſed olives with wine and fat, and uſe this medicine after the foreſaid fomentations.

CHAP. XIV.

Of Remedies for ulcerated Lungs, and Swelling of the Palate and Neck.

THERE is alſo that grievous and deſtructive diſtemper, when their lungs are ulcerated; hence a cough, and leanneſs, and at laſt a conſumption attacks them: and that theſe things may not be the occaſion of their death, you muſt bore a hole in their ear, and inſert the root of lungwort into it, as we taught above; alſo you muſt mix about an *hemina* of the juice of leeks with the like quantity of oil, and give it them to drink with a *ſextarius* of wine for ſeveral days.

Sometimes alſo the ox, by reaſon of a ſwelling of his palate, refuſes his food, groans frequently, and makes ſuch an appearance, that he ſeems to hang towards one ſide. It is neceſſary to lance his palate, that the blood may flow out abundantly, and to give him bitter vetches ſoaked in water, without their huſks and green leaves, or ſome other ſoft fodder, till he be cured.

If his neck be bruiſed in doing his work, letting him blood in the ear is the moſt ſpeedy and effectual remedy; or if this is not done, an herb, which they call *avia* (1), bruiſed with ſalt, and put upon it. If

(1) *Avia.* This herb is not deſcribed by any author I have ſeen. It is very probable, this is not the right name. There are ſeveral emendations offered by critics; but their conjectures are ſo ill ſupported, that it is better to leave it in uncertainty, than trouble the reader with them.

his neck be moved from its uſual poſture, and hangs down, we muſt conſider towards which ſide it declines, and let him blood in the oppoſite ear. Moreover, we muſt firſt beat that vein in the ear, which appears the largeſt, with the ſpray of a vine. Then, after it is ſwelled with the laſhes, you muſt open it with a lancet; and, the day after, let him blood again in the ſame place; and let him reſt from labour for two days: then the third day you exact ſome eaſy labour of him, and by degrees bring him to perform his ordinary taſk.

But if his neck declines to neither ſide, and is ſwelled in the middle, you muſt let him blood in both ears; and, if blood be not let within two days after the ox has received the hurt, his neck ſwells, and the nerves are ſtretched; and hence ariſes an hardneſs which cannot endure the yoke. We have found for ſuch an ailment a moſt excellent medicine compounded of liquid pitch, ox's marrow, and goat's tallow, and old oil, in equal quantities, and boiled together. You muſt uſe this compoſition thus. When the ox is looſed from his work, you muſt wet the ſwelling of his neck with the water of that pond out of which he drinks, and then dry it, and rub it, and anoint it with the foreſaid medicine. If he refuſes the yoke intirely, becauſe of the ſwelling of his neck, you muſt give him reſt from his labour for a few days. Then his neck muſt be rubbed with cold water, and anointed with the ſcum of ſilver. *Celſus*, indeed, orders the herb called *ſcuta* to be bruiſed, as I ſaid before, and put upon his ſwelled neck. There is leſs trouble in ſmall boils, which commonly infeſt his neck: for it is eaſy to drop oil out of a lamp into them when he is at work. Nevertheleſs, 'tis a better way to take care, that they may not breed there, and that their necks may not grow bald, which otherwiſe do not loſe their hair, and become bare, but when their neck is either wet with ſweat or rain, while they are at their work. Therefore, when this happens, you muſt rub one old brick againſt another, and, with the ſmall duſt that falls from them, ſprinkle their necks before they are unyoked: then, after this brick-duſt dries upon the part, moiſten it with oil from time to time.

CHAP.

CHAP. XV.

Of curing their Paſterns or Hoofs when they are hurt.

IF (1) the ſock has hurt his paſtern or hoof, burn upon the wound, with a red-hot iron, hard pitch and hogs-lard, or axle-tree greaſe, wrapped up with ſulphur, and new-ſhorn greaſy wool; which ſame remedy has a very good effect, after you have taken a ſtick or root out of the ox's foot, if by chance he has trodden upon a ſprig or ſpray, or pierced his hoof through with a ſharp tile, potſherd, or ſtone; which, nevertheleſs, if it be wounded to a greater depth, muſt be cut all round with a knife, to a conſiderable breadth, and ſo have theſe materials burnt upon it, as I directed above: then by putting a ſhoe of *Spaniſh* broom upon his foot, and ſprinkling vinegar upon it for three days, it will be healed. Alſo, if the ſock has wounded his leg, you muſt put the ſea-lettice, which the *Greeks* call Τιθύμαλος, mixed with ſalt, upon it.

When his feet are worn and bruiſed underneath, they muſt be throughly waſhed with ox's urine warmed; then you muſt ſet fire to a bundle of ſprays, and, when the fire falls to embers, you muſt force him to ſtand upon the hot aſhes, and anoint his hoofs with liquid pitch mixed with oil, or axle-tree greaſe. Nevertheleſs, oxen will be leſs liable to be lame, if their feet are waſhed with plenty of cold water, when they are unyoked from their work, and afterwards their paſterns, coronets, and alſo the cleft itſelf, which divides the hoof of the ox, be rubbed with old hogs-lard, or axle-tree greaſe.

CHAP. XVI.

Of Remedies for their ſprained Shoulders, and broken Horns.

SOmetimes alſo the ox ſprains his ſhoulders, either with the weight of his load in a long rugged way, or when in tilling he ſtruggles with very hard ground, or with the root of a tree that he meets with

(1) The firſt ſentence of this chapter ſeems to want ſome words; but the meaning is obvious, and the words that are wanting may very well be ſupplied from *Vegetius*, who frequently copies *Columella's* own words, *lib.* iii. 4.

in his way. When this happens, you muſt let him blood in his fore-legs; if he has hurt his right ſhoulder, he muſt be bled in the left leg; if his left, you muſt bleed him in the right leg. If he has hurt both his ſhoulders to a greater degree, you muſt alſo open the veins of his hinder legs.

When his horns are broken, you muſt put linen clouts upon them, ſoaked in ſalt, vinegar, and oil; and, having bound them up, pour the ſame upon them for the ſpace of three days. Then the fourth day you muſt put axle-tree greaſe with liquid pitch in equal quantity, and pine-tree bark ſmoothed, upon them; and laſt of all, when they have begun to form a ſcar, you muſt rub them with ſoot.

Ulcers alſo, when neglected, uſe to ſwarm with worms; which, if in the morning they are ſprinkled with cold water, ſhrink and grow ſtiff with the cold, and fall out of them. Or, if they cannot be taken out by this method, you muſt bruiſe horehound, or leeks, and mix ſalt with them, and put them upon the ulcers. This very quickly kills the foreſaid animals. But the ulcers being throughly cleanſed, you muſt preſently apply liniments with pitch and oil, and ſtale axle-tree greaſe, and the wounds muſt be anointed all round on the outſide, with the ſame medicament, that they may not be infeſted with flies, which breed worms when they ſettle upon ulcers.

CHAP. XVII.

Of Remedies againſt the Bitings of Serpents, and other noxious Animals.

THE bite of a ſerpent alſo is mortal to oxen, and the poiſon of leſſer animals alſo is hurtful to them: for both the viper, and the ſloe-worm, provoked with his weight, when in the paſture the ox has improvidently lain down upon them, often faſten their teeth on him. And the ſhrew-mouſe, which the *Greeks* call μυγάλη (1), altho' its teeth are very ſmall, is the occaſion of no ſmall miſchief to them. The herb which they call *Vipers Bugloſs* (2), bruiſed and laid with

(1) Μυγάλη. Some ſay it is ſo called, *quia ἐκ μυὸς καὶ γαλῆς γίνεται*, becauſe it is of a mouſe and a weaſel.

(2) *Perſonata. Plin. Nat. Hiſt. lib.* XXV. *cap.* 9. ſays, that *echion*, vipers bugloſs, is called by this name, and recommends it, among other things, againſt the bitings of ſerpents. He ſays, that no herb has a broader leaf, and that it produces great burs.

ſalt

ſalt upon the ſcarification made with a knife, drives away the poiſon of the viper. The root alſo of the ſame, bruiſed, is more effectual; or *Simonian Trefoil* (3), that which is found in rough craggy places, is ſaid to be the moſt effectual: it is of a very diſagreeable ſmell, and not unlike bitumen; and therefore the *Greeks* call it *Aſphaltion*: but our people, becauſe of its ſhape, call it *Trifolium acutum*, ſharp trefoil; for it grows up with long and briſtly leaves: it makes a ſtronger ſtalk than that which grows in meadows. They pour the juice of this herb, mixed with wine, into their chops; and ſpread the leaves themſelves bruiſed with ſalt, in the manner of a pulteſs, upon the ſcarification. Or, if the ſeaſon of the year does not afford this green herb, they gather the ſeeds of it, and ſmooth them, and give them with wine to drink; and they put upon the ſcarification the roots of it bruiſed with its own ſtalk, and mixed with meal and ſalt, after they have been ſoaked in honey-water. It is alſo a ſpeedy and effectual remedy, if you bruiſe five pound weight of the tops of aſh, with as many *ſextarii* of wine, and two of oil; and, after you have ſqueezed out the juice, pour it into their chops: alſo you may put the tops of the ſame tree, bruiſed with ſalt, upon the part that is hurt.

The bite of a ſloe-worm cauſes a ſwelling and ſuppuration: that of a ſhrew-mouſe has the ſame effect. But the hurt ſuſtained by the firſt is cured with a brazen awl, if you prick the place that is hurt with it, and anoint it with *Cimolian* chalk, or clay (4), ſoaked in vinegar. The mouſe pays with her own body for the miſchief it has been the cauſe of; for they plunge the animal itſelf into oil, and kill it; and, after it is putrified, they bruiſe it, and with that medicine they anoint the part that is bitten by the ſhrew-mouſe: or, if that cannot be had, and the humour ſhews the hurt that its teeth have done, they bruiſe cumin, and add a little liquid pitch, and hogs-lard, or axle-tree greaſe, to it, that it may have the clammineſs of a pulteſs: this put upon it removes the miſchief: or if, before the ſwelling is diſcuſſed, it turns to a ſuppuration, it is beſt to cut off all the ſuppurated part

(3) *Simonianum trifolium*, ſo called from *Simus* a phyſician, who probably firſt found out the qualities of this ſort of trefoil. *Pliny* makes mention of him, and by his authority ſupports his opinion, that this ſort of trefoil has ſomething of a poiſonous quality; for he ſays, that if either a decoction of it, or the juices of it bruiſed, be poured into the body, it will occaſion the ſame burnings and itchings, as it does when it is laid upon the wound made by the bite of a ſerpent; and adviſes not to uſe it but againſt the poiſons of ſerpents, where *Pliny* ſuppoſes it may operate, as one ſort of poiſon does againſt another.

(4) *Cimolia creta*, a kind of chalk or fullers earth, which is found in the iſland *Cimolus*, which is one of the iſlands the antients called *Sporades*: it lies in the *Cretian* ſea, and is by the inhabitants ſtill called *Kimolo*, tho' it ſeems the *Venetians* have changed its name, and call it *Argentiera*.

with

with a burning-hot lamin, and to burn all the affected part with an hot iron, and ſo anoint it with liquid pitch and oil. They alſo uſe to wrap up the animal itſelf alive in potters clay, and, after it is dried, to hang it at the neck of the oxen. That thing preſerves the cattle from receiving any hurt from the bite of a ſhrew-mouſe.

Diſeaſes or blemiſhes in their eyes are for the moſt part cured with honey: for, if either they are ſwelled, they ſprinkle honey-water upon wheat-flour; and put it upon them, or, if there be a white ſpot or web in the eye, mountain ſalt (5), or *Spaniſh* ſalt, or ammoniac (6), or *Cappadocian* ſalt (7) alſo, bruiſed very ſmall, and mixed with honey, diminiſhes the blemiſh. The ſhell of the cuttle-fiſh bruiſed, and blown into the eye thrice a day through a reed, has the ſame effect. The root, which the *Greeks* call *Silphion*, but the common people, according to the cuſtom of our country, call *Laſerpitium*, Laſerwort, does the ſame. To any quantity whatſoever of this, they add ten parts of ſal ammoniac, and throw them likewiſe into the eye, after they have been bruiſed in the ſame manner: or the ſame root bruiſed, and mixed with the oil of maſtich, and put upon the eye, purges away the blemiſhes. Barley-meal ſoaked in water, and dried at the fire, and ſprinkled with honey-water, and put upon their eyebrows and cheeks, ſuppreſſes an inflammation and fluxion in their eyes; and the ſeeds of the wild parſnip, and the juice of the wild radiſh, with honey, aſſwage the pain of the eyes, when they are anointed therewith. But whenever honey, or any other juice, is applied with remedies, the eye muſt be anointed all round with liquid pitch and oil, that it may not be infeſted by the flies; for not theſe only, but bees alſo, fly to the ſweetneſs of honey, and other medicines.

(5) *Sal montanus*, by *Vegetius* called *foſſil ſalt*, becauſe it is dug out of pits or quarries upon mountains, where it is cut like ſtone out of quarries.

(6) *Sal ammoniacus*, ſo called, as *Pliny* tells us, becauſe it is found under the ſands in great quantity, in the ſandy deſerts of *Africa*, eſpecially in the *Cyrenian* tracts: therefore it has its name, not from the place where *Jupiter Hammon's* temple ſtood, but from the ſand where-ever it is found.

(7) *Sal Cappadocius*. *Pliny* mentions two ſorts of ſalt found in *Cappadocia*, one ſort formed in the extreme parts of a lake, where the water is condenſed into ſalt by the heat of the ſun; and another ſort dug out of the mountains in very great quantities, and in great lumps.

CHAP.

CHAP. XVIII.

Of Remedies to be given them when they have ſwallowed an Horſe-leech with their Water.

AN horſe-leech alſo, ſwallowed with their water, is often the cauſe of great miſchief. This, ſticking to their jaws, ſucks the blood, and by its growth ſhuts up the paſſage for their food. If it is in a place ſo difficult to come at, that it cannot be pulled away with the hand, put a pipe or reed into it, and ſo pour warm oil into it: for, whenever this touches it, the animal falls off. Alſo the ſmell of a burnt bug may be conveyed into it through a pipe; for the bug, when it is put upon the fire, ſends forth a ſmoke, and the pipe conveys the burning ſmell, that it attracts as far as the horſe-leach; and that ſmell drives it away, and makes it quit its hold. If, neverthelaſs, it takes hold, either of the ſtomach, or inteſtines, it is killed with hot vinegar poured into them through an horn. Although we have directed theſe medicines to be applied to oxen, nevertheleſs there is no doubt, but very many of them are alſo proper for all ſorts of greater cattle.

CHAP. XIX.

Of a Machine in which Cattle are ſhut up when their Sores are dreſſed.

BUT a machine alſo muſt be framed, wherein horſes and oxen may be ſhut up and dreſſed, and that they who have the cattle under cure, may have nearer acceſs to them, and that the four-footed beaſt may not, by ſtruggling againſt them, refuſe the remedies at the very time they are dreſſing him. And this is the form of ſuch a machine: You muſt lay a firm compact floor upon the ground with oaken planks, of nine feet in length; and let the fore-part have two feet and an half in breadth; and the hinder-part four feet. Upon this floor you muſt fix on both ſides of it four upright poſts of ſeven feet. Moreover, you muſt faſten ſuch of them as are in the very four corners to one another. And bind them all to each other with ſix croſs-poles, as if they were rails, ſo that the four-footed beaſt may be brought into

it

it at the hinder-part where it is broadeſt, as into a cage, and may not be able to go out at the other end, the ſmall oppoſite planks hindering him. But upon the two firſt erect poſts you muſt place a ſtrong yoke or beam, to which horſes may be tied with an halter, or the horns of the oxen be faſtened; where you may alſo frame ſtocks or collars, that, after their head is put into them, their neck may be held faſt by rulers, or pins deſcending through holes made in them: the reſt of their body is bound faſt, being intangled and diſtended with the poles that are laid acroſs, ſo that the beaſt is expoſed to the will and pleaſure of him that has him under cure, without being able to move. This very machine ſhall be common for all four-footed beaſts of a larger ſize.

CHAP. XX.

Of the Form and Shape of a Bull.

FOraſmuch as we have given you ſufficient inſtructions concerning oxen, it will be proper and convenient now to ſpeak of bulls and cows. I am of opinion, that bulls are moſt to be approved, which have the largeſt members, are of a gentle diſpoſition, and good-natured, and of a middle age: as to other things, we muſt obſerve almoſt the ſame directions in chuſing them, as in chuſing oxen. For in no other thing does a good bull differ from one that is caſtrated, but that he has a grim, ſtern countenance, a more lively, briſk aſpect, ſhorter horns, a more brawny neck, and ſo huge, that it makes the greateſt part of his body, with a ſomewhat lanker and more truſſed up belly; and that he is more ſtraight, and fitter for coupling with the females.

CHAP. XXI.

Of the Form or Shape of a Cow.

COWS alſo are approved, which are of the talleſt make, and long, with very great bellies, exceeding broad foreheads, black, wide, and full eyes, beautiful horns, that are both ſmooth, and inclining to black, hairy ears, flat, compreſſed cheek-bones, exceeding large dew-laps and tails, moderately ſmall hoofs and legs. As to other things, almoſt the ſame are required in the females as in the males, and eſpecially,

cially, that they be young; becauſe when they are above ten years old, they are uſeleſs for breeding. On the other hand, they muſt not be put to the bull when they are under two years old: if, nevertheleſs, they conceive before, I think it proper, that their young be taken from them, and that during three days their udders be emptied, that they may not be in pain, and that afterwards they be intirely removed from the milk-pail.

CHAP. XXII.

Of reviewing and picking the Cattle every Year.

BUT you muſt take care to review every year this ſort of cattle, as well as all other herds and flocks whatſoever, and to pick them carefully: for, both ſuch as have brought forth young, and are old, and have left off breeding, muſt be removed; and alſo ſuch as have never been with young, which take up the place of thoſe that are fruitful, muſt be baniſhed from the herd, or broken for the plough; for, by reaſon of the barrenneſs of their womb, they can endure labour and fatigue no leſs than bullocks.

This kind of cattle deſires to have their winter quarters upon the ſea coaſt, and expoſed to the ſun; and in the ſummer delights more in the darkeſt receſſes of woods, and tops of mountains, than in plain paſtures: for their hoofs are better hardened (1) in graſſy woods and thickets, and ſedge-plots, than in ſtony places. Nor have they ſuch a deſire for rivers and brooks, as for pools made by hand; becauſe river-water, which is commonly colder, makes them caſt their calves; and rain-water is ſweeter. Nevertheleſs, all cows whatſoever can endure external cold, better than horſe-cattle of any kind: therefore they eaſily paſs the winter in the open air.

(1) *Durantur ungulæ.* There is very great reaſon to think, as *Pontedera* obſerves, that the text is corrupted in this place; for it cannot be, that their hoofs are better hardened in watery places, marſhes, and fens, than upon hard and rocky mountains; for *Varro, lib.* ii. *cap.* 8. ſays, that mules, bred in marſhy and ouſy places, have ſoft hoofs; but if they be driven in the ſummer-time to the mountains, as in the territory of *Reate*, their hoofs become exceeding hard: and *Columella* himſelf ſays, *lib.* vii. *cap.* 37. that it is fit to remove a mule from its dam when it is one year old, and ſend it to the mountains to harden its hoofs; ſo that it ſeems neceſſary to read it *ſaturantur juvencæ.* That graſſy woods and marſhes afford better paſture for heifers. And this is evident from the following words, which are more ſuitable to this amendment. *Geſnerus* thinks, that it comes near to the common reading, to change it to *durant juvenculæ.*

CHAP. XXIII.

Of making Incloſures and Stables.

BUT you muſt make incloſures for them in a wide ſpace, that ſo, in ſtrait and narrow places, the one may not cruſh the other, and make her caſt her calf, and that the weak may be able to avoid the blows of the ſtronger. Stables that are laid with great rough ſtones, or round pebbles, are the beſt: nevertheleſs, ſuch as are laid with gravel alſo, are not incommodious; thoſe, becauſe they throw off and refuſe the ſhowers; and theſe, becauſe they ſuck them up quickly, and let them paſs through. But let them both be ſloping, that they may throw off the moiſture; and let them look to the ſouth, that they may dry eaſily, and not be expoſed to cold winds.

Paſture-grounds require but very little care; for, that the graſs may thrive the better, and ſpring up in greater plenty, commonly in the latter end of the ſummer they ſet it on fire: this both makes tenderer new graſs to ſpring up again, and the thorns and briars being burnt, it checks the ſhrubs and herbs with great ſtalks, which would riſe to a great height. But ſalt, thrown upon rocks and troughs near the incloſure, contributes to the health of their bodies: to this they willingly have recourſe, after they have filled their bellies, when with the paſtoral ſignal there is as it were a retreat ſounded. For this ought always to be done towards the twilight, that ſo, at the ſound of the horn, the cattle, if any of them remain ſtill in the woods, may accuſtom themſelves to return to their incloſures; for ſo the whole herd may be reviewed, and their number reckoned up, if, according to military diſcipline, as it were, they abide within the quarters aſſigned them by the keeper of the ſtables. But the ſame power and authority is not exerciſed over bulls, which, relying upon their great ſtrength, wander through the woods, and have free egreſs and ingreſs, and return when they pleaſe, and are not called back, unleſs it be to couple with the females.

CHAP.

CHAP. XXIV.

Of the Age fit for a Bull to couple with the Female.

SUCH of the bulls as are younger than four, and older than twelve years, are not allowed to couple with the females: thoſe, becauſe of their puerile age, as it were, are reckoned not very fit for raiſing a new breed, and increaſing the herd; theſe, becauſe they are worn out with old age, and paſt gendering. In the month of *July*, for the moſt part, the females muſt be allowed to be with the males, that ſo the next ſpring, when the forage is grown up, they may bring forth the young they conceived at that time. For they go with young ten months, nor do they ſuffer the male at the command of their keeper, but of their own accord; and for the moſt part their natural deſires anſwer to the time I have mentioned, becauſe the cattle, being exhilarated with the ſuperabundance of vernal forage, grow laſcivious. But if either the female refuſes, or the male has no deſire, their deſire is raiſed by the ſame method we ſhall preſently direct with reſpect to horſes which diſdain the female, *viz.* by conveying the ſmell of their genitals to their noſtrils.

But you muſt with-hold a part of their fodder from the females about the time you put them to the male, leſt the too great fatneſs of their body make them barren; and you muſt add to the bulls allowance, that they may be the ſtronger for gendering; and one male may abundantly ſuffice for fifteen cows: and when he has leapt upon an heifer, you may know, by certain ſigns, which ſex he has generated; becauſe, if he leapt off at the right ſide, it is manifeſt he has gendered a male; if at the left ſide, a female. Nevertheleſs, that does not appear to be true, otherwiſe, but when, after one coition, being with calf, ſhe does not afterwards admit the bull; which very thing rarely happens. For, altho' ſhe be with young, yet her luſt is not fully ſatisfied: ſo mighty powerful even in cattle, beyond the bounds of nature, are the flattering allurements of pleaſure. But there is no doubt, where there is great plenty of fodder, that a cow may have a calf, and bring it up every year; but, when there is a ſcarcity of forage, ſhe ought to be put upon breeding every other year, which we are of opinion ought to be done, eſpecially with reſpect to cows that are put to labour, that ſo the calves may be ſatiated with milk for the ſpace of one whole year; and that the cow which is with calf may not be

grieved and oppreſſed with the burden both of her belly and her work at the ſame time: and after ſhe has brought forth her young, unleſs ſhe be ſufficiently ſupported with food, tho' ſhe be a good nurſe, yet, being fatigued with labour, ſhe with-holds from her ſon a great part of his nouriſhment. Therefore they give her, after ſhe has calved, green *Cytiſus*, (ſhrub-trefoil) and parched barley, and ſoaked bitter vetches; or they give her a drench of young colewort, and toaſted and ground millet (1), and ſoaked in milk for one night, mixed together. The *Altinian* cows (2) alſo, which the inhabitants of that country call *Cevas* (3), are more eſteemed for theſe uſes. Theſe are of a low ſtature, and yield abundance of milk; for which reaſon, their own offspring, being removed from them, are brought up and educated at the udders of thoſe that are aliens and utter ſtrangers to them: or, if this relief is not at hand, bruiſed beans and wine ſuſtain them very well; and this muſt be done eſpecially in great herds.

CHAP. XXV.

Of Remedies for Worms in Calves.

BUT worms, which commonly breedin crudities, are uſually hurtful to calves; therefore they muſt be moderately fed, that they may digeſt well: or, if they labour already under ſuch an indiſpoſition, they bruiſe parboiled lupins, and thruſt morſels of them down their throats in the manner of a drench. Alſo the herb *Santonica*, (wormwood of *Saintonge*) may be bruiſed together with dry figs and bitter vetches, and made into ſops, and put down their throats, as if it were a drench. One part of greaſe, mixed with three parts of hyſſop, has the ſame effect.

(1) *Tenero ulere*, et cætera, *ſalivatur*. From the different readings of this ſentence, *Pontedera* is of opinion, that it ought to be corrected thus; *Et tener vitulus tortido molitoque milio, &c. ſalivatur*. This correction is not improbable; for *Palladius*, who copies from *Columella*, ſays, that toaſted and ground millet, mixed with milk, ought to be given them in the manner of a drench.

(2) *Altinæ vaccæ*. *Pliny*, *lib.* viii. *c.* 45. mentions *vaccæ Alpinæ*; and Father *Hardouin* takes occaſion there to correct this place of *Columella*, and ſays, that it ought to be read *vaccæ Alpinæ*; for if the author had meant, that they had their name from *Altina*, a town in *Italy*, they would have been called *vaccæ Altinates*; and accordingly *Columella*, *lib.* vii. *c.* 2. has *oves Altinates*.

(3) *Cevas*. *Geſnerus* thinks, that this word is almoſt the ſame with *kube*, or *kuwe*, the *German* or *Swiſs* word for *vacca*, a cow; and the author might mean, cows brought out of *Swiſſerland* for the purpoſe mentioned in the text.

Alſo

Alſo the juice of horehound, and of the leek, is effectual for killing animals of this ſort.

CHAP. XXVI.

Of caſtrating Calves.

MAGO is of opinion, that calves ſhould be caſtrated while they are yet very young; and adviſes not to do it with a knife, but to compreſs their teſticles with cloven fennel-giant, and to bruiſe them by degrees; and he thinks, that of all ways of caſtrating, that is the beſt, which is performed upon the young and tender age, without a wound; for, when the calf is already grown ſtrong, and the parts hardened, it is better to caſtrate him when he is two years old, than when he is one. And he directs to do it either in the ſpring, or in autumn, when the moon is decreaſing, and to bind the calf to a machine; then, before you apply the knife, to take hold with two wooden rules (as it were with a pair of pincers) of the ſtrings of the teſticles, which the *Greeks* call κρεμαςῆρας (1), for this reaſon, becauſe the genital parts hang by them; and, having taken faſt hold of them, preſently to lay open the teſticles with a knife; and, after you have ſqueezed them out, to cut them in ſuch manner, that the extreme part may be left ſticking to the foreſaid ſtrings: for, by this method, the ſteer is neither endangered by the eruption of the blood, nor intirely emaſculated, by taking away all his virility; but, preſerving the form of a male, he lays down his power of gendering, which, nevertheleſs, he does not preſently loſe; for, if you ſuffer him, after he is newly caſtrated, to couple with the female, it is manifeſt ſhe may conceive by him. But that is not at all to be permitted, leſt he periſh by a large effuſion of blood; but you muſt anoint his wounds with ſpray-aſhes, and the ſcum of ſilver; and you muſt keep him that day from water, and nouriſh him with very little food. The three following days you muſt ſolace and cheriſh him, as if he were ſick, with tops of trees, and green fodder cut down for him, and reſtrain him from much drinking. I adviſe you alſo to anoint the wounds themſelves, after three days, with liquid pitch and aſhes, with a little oil, that they may both cloſe, and form a ſcar the more quickly, and not be infeſted by the flies. What we have ſaid thus far of oxen is abundantly enough.

(1) Κρεμαςῆρες, Cremaſters, from κρεμα'ω, *ſuſpendo.*

CHAP.

CHAP. XXVII.

Of Horſes.

IT is highly proper, that they who have the bringing up of the horſe-kind much at heart, ſhould provide an induſtrious keeper, and plenty of forage, both which, ſuppoſe they be but indifferent and ordinary, may ſerve for other cattle. But horſe-cattle requires the greateſt diligence and attendance, and a large quantity of food, even as much as they can eat. This kind is divided into three ſorts; for there is a noble generous breed, which furniſhes horſes for the *Circus*, and the Sacred Games. There is the mule-breed, the foals of which are purchaſed at a noble price. There is alſo the vulgar breed, which produces indifferent and ordinary males and females. The more excellent each of theſe ſorts is, the more plentiful and rich field they have aſſigned to them for their paſture. But, for herds of this kind of cattle, ſpacious, marſhy, and alſo mountainous paſtures, muſt be choſen; ſuch as are well watered, and never naturally dry; rather free from any kind of trees or ſhrubs, than intangled and incumbred with them; abounding in very thick and ſoft, rather than in high graſs.

Vulgar ordinary horſes, both male and female, are allowed to feed together promiſcuouſly; nor are there any certain times obſerved for putting the males and females together. Let the males be joined to the females, of a noble and generous race, about the time of the vernal Æquinox, that ſo foaling at the ſame time of the year wherein they conceived, they may bring up their foals with little labour, the fields being now verdant, and abounding in graſs after the harveſt is gathered in; for they bring forth their young in the twelfth month. Therefore great care muſt be taken, at the foreſaid time of the year, that both the mares and the ſtallions may have full liberty to couple, when they have a deſire to it; becauſe this kind of cattle, eſpecially if you reſtrain them, is extimulated by the furious ragings of luſt; and it is for that reaſon, that the name *Hippomanes* (1) is given to that poiſon, which kindles in mortals a fire of love, like the libidinous deſires of horſes. Nor is there any doubt, but, in ſome countries, the

(1) *Hippomanes*, ἀπὸ τῆς μανίας τῆς ἵππου. *Plin. Hiſt. Nat. lib.* viii. 42. ſays, that this is an excreſcence in the forehead of a foal, at the time it is foaled, which was a principal ingredient in philtres, and other poiſonous draughts. They who have the curioſity to know more of it, may conſult *Pliny* and *Ariſtotle*. *Virgil* alſo, in his 4th *Æneid*, and in ſome other places, makes mention of it.

mares are inflamed with ſuch a ſtrong and ardent deſire of coition, that, altho' they have not the male, yet, by their continual and exceſſive deſire, raiſing in themſelves the imagination of venery, they (in the manner of fowls conſtantly kept in a barton) conceive with the wind: which things the poet expreſſes with greater licence (2):

'But, more than all, remarkable and ſtrange
'The fury of the mares: fair *Venus'* ſelf
'Gave them this bent of mind, juſt at the time
'When the four *Potnian* mares, which drew the car
'Of *Glaucus*; all his limbs in pieces tore
'With their devouring jaws. Them *Cupid* leads
'O'er *Gargarus*, and o'er the ſounding ſtream
'Of loud *Aſcanius*: they o'er the tops
'Of mountains climb, and over rivers ſwim.
'Still in their tender marrow lurks the flame,
'And new deſires ariſe, which, in the ſpring,
'More ardent grow; for then the genial heat
'Into their bones returns; then to weſt winds
'All turn their heads, and on the lofty rocks
'Stand pauſing, and the light and cooling breeze
'Snuff up; and often by the wind conceive,
'Without the male, (too wondrous to relate!)
'Then over rocks, and hills, and dales, they fly:
'Not where, *Eaſt Wind!* thou firſt beginn'ſt to blow,
'Nor where the ſun firſt rears his radiant head;
'But whence the north and north-weſt winds ariſe,
'And ſouth wind, which, with blackeſt darkneſs clad,
'With cold and rains, makes ſad the chearful day.'

Foraſmuch as it is a thing alſo very well known, that on the Sacred Mountain in *Spain* (3), which extends itſelf toward the weſt, hard by the ocean, mares have frequently been pregnant without coition, and

(2) *Virg. Georg. lib.* iii. 266.

(3) *Monte Sacro. Varro* ſays, that this happens upon mount *Tagrus* in *Portugal*, near *Lisbon*, hard by the ocean. *Pliny* alſo mentions this fable, and ſays, that it was a thing which was well known to happen upon the river *Tagus* near *Lisbon*, &c. It cannot but ſeem ſtrange, that ſuch grave authors ſhould mention this as a thing to be depended on. *Virgil*, indeed, is to be excuſed, who, as a poet, might indulge his own fancy. But *Juſtin* ſpeaks more rationally, and ſays, that many authors indeed had delivered it as a truth; but that it was only a fable, which had its riſe from the fruitfulneſs of mares, and the vaſt multitude of horſes, in *Gallicia* and *Luſitania*, which are ſo numerous, and ſo ſwift, that not without

and have brought up their offspring; which nevertheleſs is of no uſe, becauſe it is ſnatched away by death when three years old, before it comes to maturity.

Wherefore, as I have ſaid, we muſt take care, that mares be not tormented with their natural deſires, about the time of the vernal Æquinox. But, during the reſt of the year, you muſt remove from the females the horſes of great value, that they may neither cover them when they have a mind to it, nor ſuffer harm, if they are reſtrained from doing it, when they are ſolicited by their natural deſires: therefore I am of opinion, that the male ought either to be ſent out of the way into very diſtant paſtures, or kept at his manger. And, at the time when he is invited by the females, he muſt be ſtrengthened with a large allowance of food; and, when the ſpring approaches, you muſt pamper him with barley and bitter vetches, that he may endure the fatigue of venery; and the ſtronger he is for this taſk, ſo much the ſtronger ſeminal principles will he communicate to his future offspring.

Some alſo direct us to fatten a ſtallion (4) in the ſame manner we do mules, that ſo, being heartened by this good keeping, he may ſuffice for very many females. Nevertheleſs, one ſtallion ought not to impregnate leſs than fifteen, nor more than twenty mares. And he may be made uſe of for this purpoſe when he is three years old; and for the moſt part he is fit for it till he is twenty. But if the ſtallion is lazy, and backward to perform his part, they paſs a ſponge over the parts of the female, and convey the ſmell to the horſe's noſtrils, by rubbing him with the ſame. On the other hand, if the mare will not ſuffer the male, they anoint her natural parts with bruiſed ſquills, which thing kindles her luſt. Sometimes alſo a vulgar ignoble horſe raiſes in them a deſire of coition; for, when he is let into her, and has almoſt brought her to a compliance, they take away the female, and, now ſhe is become more paſſive, they put a horſe of a nobler breed upon her. From the time they are pregnant, greater care muſt be taken of them, and they muſt be ſtrengthened with plentiful paſtures: and if with the cold of winter the graſs ſhall fail, let them be kept in

without reaſon they may ſeem to be conceived by the wind. Some authors think, that both in our author, and in *Varro*, the true reading is, *Monte Artabro*. *Pliny*, indeed, ſays, that in this place of the country there is a vaſt promontory, which runs out into the ocean, which ſome called *Artabrum*, *lib.* iv. 21. Perhaps it was called the *Sacred Mount*, from ſome famous temple that ſtood there.

(4) *Admiſſurium ſaginare eodem modo quo mulos.* *Pontedera* thinks, that inſtead of *mulos* we ought to read *tauros*; for, as mules do not propagate, it is not probable the author had his eye upon them: but both *Varro* and *Columella*, and other antient authors, direct us to pamper bulls at a certain ſeaſon, and keep them apart from the cows till the proper time.

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the houſe, and neither be employed in working, nor running, nor expoſed to the cold, nor ſhut up in a narrow confined place, leſt one make the other caſt her foal; for all theſe inconveniences have this effect.

But if the mare has ſuffered, either in foaling, or by abortion, rock-fern bruiſed, and throughly mixed with lukewarm water, and given through a horn, will be a remedy for her. But, if all has ſucceeded well, the foal muſt by no means be handled; for he is hurt even by the lighteſt touch: only care muſt be taken, that he keep with the dam in a large and warm place, leſt either the cold hurt him, while he is yet weak, or his mother ſqueeze and bruiſe him in a narrow ſtraight place. Then you muſt bring him out, by little and little, and take care that he do not parch his hoofs with the dung. When he is grown ſtronger, he muſt be preſently ſent out into the ſame paſtures where his mother is, leſt the mare be in pain for want of her foal. For this kind of cattle eſpecially, catches hurt from the love they have to their young, unleſs they be allowed to have them in their company. It is uſual for a vulgar mare to bring a foal every year; it is proper to reſtrain one of a noble breed every other year, that ſo her foal, growing ſtronger with his mother's milk, may be prepared for the labours of the public games.

CHAP. XXVIII.

Of the Age of a Stallion.

THEY think, that a male younger than three years is not fit for a ſtallion; but that he may procreate till his twentieth year; and that a female of two years old may very well conceive, that ſo, foaling after her third year, ſhe may bring up her foal; and that ſhe is uſeleſs after her tenth year, becauſe the breed of an old mare is ſlow and ſluggiſh. *Democritus* affirms, that it depends upon our own pleaſure, whether a male or a female be conceived: and he directs, that when we have a mind that a male ſhould be procreated, we ſhould bind the ſtallion's left teſticle with a ſmall flaxen cord, or with any other cord whatſoever; and when we would have a female, the right teſticle. And he is of opinion, that the ſame thing ought to be done with almoſt all cattle whatſoever.

CHAP. XXIX.

Of the Temper, Diſpoſition, and Form of an Horſe.

BUT when a foal is foaled, we may preſently judge of its temper and diſpoſition. If it is chearful, if intrepid, if it is neither frightened at the ſight, nor with the hearing of any new thing; if it runs before the herd; if in wantonneſs and chearfulneſs, and ſometimes in running a race, it ſurpaſſes all its equals; if it leaps over a ditch, or croſſes a river, or a bridge, without ſtopping; theſe things will be documents of the noble, ingenuous diſpoſition of his mind.

But the form of his body will appear by his very ſmall head, black eyes, wide noſtrils, ſhort and ſtraight erect ears; his ſoft and broad, but not long neck; thick mane, hanging down and ſpreading upon the right ſide; broad and well-proportioned breaſt, with brawny and regularly-ſwelling muſcles; large and ſtraight ſhoulders; inflected or bending ſides; double back-bone; lank and truſſed-up belly; two equal and very ſmall teſticles; broad and ſubſiding loins; a long briſtly and curled tail; equal, tall, and ſtraight legs; a round and ſmall knee, and not looking inwards; round buttocks; brawny, muſculous, and well-proportioned thighs; hard and high, and hollow and round hoofs, upon which middling coronets are placed; and his whole body ſo compactly formed, as to be majeſtic, tall, erect, and from its aſpect nimble and active alſo; and, as much as its figure, or natural ſhape, permits, with a tendency from long to round. But that temper and theſe manners are commended, which from gentle and quiet become fiery and eager, and, from being fiery and eager, return again to be exceeding gentle and calm: for ſuch as theſe are found to be more yielding and tractable, and exceeding patient of the labour and fatigue of the public games.

It is right to break an horſe for domeſtic uſe, when he is two years old; but, for the public games, when he is three years complete; ſo, nevertheleſs, that he be put to labour after his fourth year at fartheſt. The marks of his years change with his body; for, while he is two years and ſix months old, his upper and lower middle-teeth fall: when he is going in his fourth year, having caſt thoſe that are called the canine teeth, he brings others: then, within the ſixth year, his upper jaw-teeth or grinders fall. In his ſixth year he fills up and makes even thoſe teeth he firſt changed. In his ſeventh year they are all filled up equally, and from that time he carries them hollowed: nor afterwards can it be certainly known how many years old he is. Never-

vertheleſs, in his tenth year his temples begin to grow hollow, and ſometimes his eye-brows to grow grey, and his teeth to ſtick out. I reckon, that what I have already ſaid, relating to his mind, temper, and manners, and his body and age, may abundantly ſuffice. Now our next buſineſs is to ſhew the care that is to be taken of them, both when they are in a good and in a bad ſtate of health.

CHAP. XXX.

Of the Care of Horſes, and of Medicines proper for them.

IF horſes in good health are lean, they are more ſpeedily reſtored and made up again, with parched wheat, than with barley. But a potion of wine muſt alſo be given them, and then you muſt withdraw this ſort of food from them by degrees, mixing bran with their barley, till they be accuſtomed to live upon beans, and pure barley. The bodies of horſes muſt be daily rubbed down no leſs than thoſe of men: and oftentimes your having curried them, and rubbed their backs as hard as you can, is of more benefit to them, than if you ſhould give them the largeſt allowance of food; but it is of great importance to preſerve the ſtrength of their body and feet, both which we may maintain, if we lead the cattle at proper times to their mangers, to water and to exerciſe; and take care that they be ſtabled in a dry place, that their hoofs may not grow moiſt with wet, which we ſhall eaſily avoid, if either the ſtables are laid with oak-planks, or if the ground be carefully cleaned, and ſtraw thrown upon it.

For the moſt part, labouring horſes contract diſeaſes from wearineſs, and violent heat; ſometimes alſo from cold, and from their not having made water at their own time; or if they are in a ſweat, and drink preſently after their having been in a violent motion: or if, after they have ſtood long, they are all of a ſudden ſpurred and galloped. *Reſt* is a cure for laſſitude, if ſo be that oil, or fat mixed with wine, be poured into their chops. To a cold, fomentations are applied, and their head and back-bone are anointed with warm greaſe or wine. The remedies are almoſt the ſame, if he does not make water: for they pour oil mixed with wine upon his flanks and reins; and, if that has no good effect, they put a very ſmall ſuppoſitory, made of boiled honey and ſalt, into the hole by which the urine paſſes; or they put a living fly, or a grain of frankincenſe, or a ſuppoſitory of bitumen, into his

naturals. They apply the ſame remedies, if the urine has ſcalded his genitals.

Tears running down in abundance, and flaccid ears, and a neck over-burdened with the weight of his head, and hanging down to the ground, are indications of a pain in his head: then they cut and open the vein which is under his eye, and foment his mouth with warm water, and keep him from meat the firſt day. But the next day they give him faſting a potion of lukewarm water, and green graſs; alſo they ſpread old hay or ſoft ſtraw under him, and give him water again in the twilight, and a little barley with two pounds and an half of vetches, that with a very ſmall portion of food he may be brought to his ordinary allowance, and to perform his uſual taſk.

If an horſe has a pain in his jaw-bones, you muſt foment them with warm vinegar, and rub them all over with hogs-greaſe; and you muſt apply the ſame medicine to them when they are ſwelled. If he has hurt his ſhoulders, or if the blood be fallen down into his legs, let the veins be opened almoſt in the middle of both his legs, and let his ſhoulders be anointed with the blood that flows out of them, after you have mixed fine powder of frankincenſe with it; and you muſt apply the horſe's own dung to his flowing veins, and bind them up with bandages, that they may not be emptied more than they ought to be. Alſo, the day after, let him be blooded in the ſame veins, and treated after the ſame manner; and let him be kept from barley, and a little hay given him. Then the day following, and always till the ſixth day, let about three *cyathi*, or cupfuls, of the juice of leeks, mixed with an *hemina* of oil, be poured down his throat thro' an horn. After the ſixth day, let him be made to ſtep ſlowly; and, after he has walked, it will be proper to put him down into a pond, ſo that he may ſwim. Thus, by degrees, being cheriſhed and aſſiſted with ſtronger food, he will be brought to his ordinary allowance and, uſual taſk.

But if bile be troubleſome to an horſe; if his belly ſwells, and he does not break wind; they put their hand, anointed with oil, into his fundament, and open the natural paſſages that are obſtructed, and take out the dung: afterward they bruiſe wild origany (1), and louſewort (2) with

(1) *Cunila bubula* is the ſame with *origanum ſilveſtre*, wild *origany*. *Pliny* ſays, that it has a ſeed like penyroyal; it is called *Heracleion origanum*, or *panax Heraclea*. Father *Hardouin* quotes a verſe out of *Nicander*, to prove, that *cunila* and *origanum Heracleoticum* are the ſame. *Dioſcorides* alſo ſays, *lib.* iii. 32. that ſome call the origanum Heracleoticum, *cunila*. *Columella* ſays, *lib.* ix. 4. that the garden *cunila* is by the Ruſtics in *Italy* called *ſatureia*, ſavory.

(2) *Herba pedicularis*, louſewort; ſo called, from the effect it has in deſtroying lice.

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with ſalt, and boil them, and mix them with honey, and ſo make them into ſuppoſitories, and adminiſter them to him; theſe will move his belly, and bring away all the bile. Some pour a quarter of a pound of bruiſed myrrh, with an *hemina* of wine, down his throat, and anoint his fundament with liquid pitch. Some give him a clyſter of ſea-water; others of freſh brine. Worms alſo, like earth-worms, uſe to hurt their inteſtines, of which the ſigns are, if the horſes tumble frequently with pain; if they move their head to their belly; if they frequently toſs their tails. A preſent remedy is as we have already directed, to thruſt in your hand, and pull out the dung, and then to give them a clyſter of ſea-water, or very ſtrong brine; and afterward to pour down their throat the root of the caper-buſh bruiſed, with a *ſextarius* of vinegar: for by this means the foreſaid animals are deſtroyed.

CHAP. XXXI.

Of Remedies for a Cough.

BUT litter muſt be ſpread very deep under all feeble cattle whatſoever, that they may lie the ſofter. A freſh cough is quickly cured with lentils beaten in a mortar, and ſeparated from their huſks, and ground very ſmall; which things being thus done, they mix a *ſextarius* of warm water with the ſame quantity of lentils, and pour them down their throat: they give the like medicine for three days, and the ſick cattle is comforted and reſtored with green herbs, and the tops of trees. But an old cough is diſcuſſed with three *cyathi* of the juice of leeks with a pint of oil poured into their chops, and by giving them the ſame food as we directed before.

You muſt rub ring-worms, tetters, and whatever part the ſcab ſeizes upon, with vinegar and alum; and, if theſe continue, they are ſometimes anointed with nitre and ſciſſile alum in equal quantity, mixed throughly with vinegar. Then rub pimples, bliſters, or riſings on the ſkin with the currycomb, in the ſcorching heat of the ſun, till ſuch time as the blood be forced out of them: then they mix an equal

By *Pliny* it is reckoned to be the *ſtaphis agria* of *Dioſcorides*. It has leaves like thoſe of the wild vine, and a flower like that of woad; ſtraight, ſoft, and black ſhoots, and green little hulls or pods like thoſe of chiches; and in them a triangular rough kernel, of a black-yellowiſh colour, white within, and ſharp to the taſte. See *Matthiol. in Dioſcor. p.* 850.

quantity

quantity of the roots of *Quick-graſs* (1), ſulphur, liquid pitch, and alum; and with this medicine the foreſaid ailments are cured.

CHAP. XXXII.

Of Remedies for Hurts by Interfering, and for the Scab.

WHEN the ſkin is rubbed off, and a wound made by interfering (1), they waſh it twice a day with warm water, and, preſently after, they rub it with ſalt bruiſed and boiled with greaſe, till the ſtrength of the corrupted matter drops out of it. The ſcab is mortal to this four-footed beaſt, unleſs a ſpeedy remedy be applied to it. If it be but ſlight and inconſiderable, when it firſt begins, they anoint it in the heat of the ſun, either with the roſin or pitch of the cedar-tree (2), or with the oil of maſtich (3), or with nettle-ſeed and oil bruiſed together, or with whale-oil, or with that which ſalted tunny throws out in the diſhes it is ſerved up in. Nevertheleſs the fat of a ſea-calf contributes moſt of any thing to cure this ailment. But, if it is already become inveterate, more violent remedies are neceſſary; for which reaſon they boil bitumen, and ſulphur, and white hellebore, mixt together in equal quantities, in liquid pitch, and ſtale hogs-lard, or axle-

(1) *Agreſtis herba.* If this be the true reading, it is impoſſible to divine what kind of herb the author means: perhaps it may be, as ſome conjecture, a kind of graſs called *agroſtis*, which they ſay is a kind of herb with many knots and joints, from each of which it puts forth ſtalks upward, and roots downward; and the ſaid ſtalks are the ſeminaries of others; and ſo it proceeds, till it over ſpreads every place, which cannot be prevented but by pulling it up intirely by the roots. *Homer* mentions it, and calls it ἄγρωστιν μελίνδην. Some call it quick-graſs, or dogs-graſs.

(1) *Intertrigo, interfering*, from *inter* and *tero*. It is rubbing or knocking one beeſt againſt another; and here it ſignifies the hurt or ſore made by interfering.

(2) *Cedria* is the roſin iſſuing out of the great cedar-tree. *Pliny* indeed ſays, that *cedria* is the pitch of the great cedar called *cedrelate*. But *Dioſcorides* ſays, that the cedar is a great tree, from which that, which they call *cedria*, is gathered; by which, no doubt, he means the roſin or gum. Some authors call it *gummi*; others *lacryma* or *unguentum*, which is different from the pitch, which is extracted by fire, which *Pliny*, in his *nat. hiſt. lib.* xvi. *c.* 11. ſays, is made by cutting of wood, laying it in heaps, and ſurrounding it with furnaces; and that the liquor, which flows firſt, and is the moſt liquid, is called *cedrium*. This ſome call *virgin pitch*, being the pureſt and the beſt, the other which follows being of a groſſer quality.

(3) *Lentiſci oleo. Lentiſcus* is the tree, and the roſin of it is called *maſtiche*. *Dioſcorides* ſays, that the beſt is in the iſland of *Chios*, from which they extract an oil, as alſo from the wood of the tree. *Pliny*, in ſeveral places, mentions *oleum e lentiſco*. Some ſay the tree has its name from its pliableneſs and toughneſs.

tree-greaſe (4), and cure them with that compoſition; but they firſt ſcrape off the ſcab with a knife, and waſh it throughly with urine. Sometimes alſo it has been of great benefit to open to the quick, and cut away the ſcab with a penknife, and ſo to cure the wounds that are thus made with liquid pitch and oil, which throughly cleanſe and fill up the wounds equally; and, when they are filled up, that they may cloſe and form a ſcar the more quickly, ſoot, from a caldron or kettle, rubbed upon the ulcer, will be of very great benefit.

CHAP. XXXIII.

Of Remedies againſt Flies, and for Pains in the Eyes.

WE ſhall alſo remove flies, which infeſt their wounds, with pitch and oil, or any other ointment, mixt together, and poured upon them. As for other things, they are cured very well with the meal of bitter vetches. Cicatrices (1) or ſpecks of the eye are diminiſhed, when they are rubbed with faſting-ſpittle and ſalt, or with the ſhell of the cuttle-fiſh bruiſed with foſſile ſalt, or with the ſeed of the wild parſnip bruiſed in a mortar, and ſqueezed through a linen cloth upon the eyes. And all pains of the eyes are quickly eaſed, by anointing them with the juice of a plantane, with honey made without ſmoke, or, if this cannot be had, certainly with thyme-honey. Sometimes alſo a flowing of blood through their noſtrils has brought them into danger; and this is ſtopped by pouring the juice of green coriander into their noſtrils.

(4) *Axungia*, hogs-lard, or axletree-greaſe. Both *Pliny* and our author highly commend hogs-lard for ſeveral uſes and cures, eſpecially that of a boar, which they uſe for anointing axletrees, from which it has its name, *quaſi ab ungendo axes*. Probably they intended that which had been uſed for ſome time for that purpoſe, and then to be taken off, and applied as they directed; for the particles of the iron, by frequent attrition, mixing with the greaſe, and heated to a certain degree, may be of great efficacy in many caſes. See *Plin. nat. hiſt. lib.* xxviii. *c.* 9.

(1) *Cicatrices oculorum*. The *Greeks* call them νεφέλια; the *Latins*, *nubeculæ*, little clouds. Some define them a ſuperficial exulceration of the black of the eye, occaſioned by the diſtillation of an humour into it. Some diſtinguiſh the *albugines* and *cicatrices* thus, that theſe are upon the ſurface, and are called ἄλαι and νεφέλια; thoſe are called λευκώματα, and are the *cicatrices longius progreſſæ*.

CHAP.

CHAP. XXXIV.

Of Remedies for nauſeating of their Food, and a peſtilential falling away of their Fleſh.

SOMETIMES alſo the cattle languiſhes with a loathing of their food. A kind of ſeed, which they call *git* (1), is a remedy for this, of which they put two *cyathi* or cupfuls bruiſed to three *cyathi* of oil, and a *ſextarius* of wine, and ſo pour it into their chops. A nauſeating is alſo removed, if you give them frequently to drink the head of a garlick bruiſed with an *hemina* of wine. It is better to open an impoſtumation with a red-hot *lamina*, than with a cold iron-inſtrument; and, when it is ſqeezed out, it is afterwards cured with linaments. There is alſo that peſtilential pining ſickneſs, when, in a few days, mares are ſeized with a ſudden leanneſs, and then with death. When this happens, it is of ſome benefit to them to pour into each of them, through their noſtrils, four *ſextarii* of ſalt-fiſh-pickle, or mackrel-brine (2), if they be of a leſſer ſize; for, if they be of a larger ſize, you may even pour a *congius* of it into each of them. This brings out all the rheum through their noſtrils, and throughly purges the cattle.

CHAP. XXXV.

Of Madneſs incident to Mares.

THERE is a madneſs which ſeizes mares, which is rare indeed, but very well known, that, when they have ſeen their own image in the water, they are taken with a ſilly vain love of it; and thereby forgetting

(1) *Gith* or *git*. The *Greeks* call it *melanthion* or *melanſpermon*, from the blackneſs of its ſeed. It is commonly called *nigella*, fennel-flower, or devil-in-a-buſh.

(2) *Garum*, a certain ſalt liquor or ſauce made of a fiſh, which the *Greeks* called *garon*. There is no certain account given of this fiſh; therefore we may ſay it is now unknown. The ſame ſort of liquor was afterwards made of many different fiſhes, which ſtill retained the antient name *garum*. We have this account of the way of making it: they threw the inteſtines of fiſhes into a veſſel, and ſalted them, and then ſet them out in the ſun to macerate, frequently turning them, till they had formed a certain quantity of liquor, the fineſt of which they drained off, and called it *garum*. Of the remainder or refuſe of all this ſtuff they

forgetting their food, they pine away, and periſh with deſire. The ſigns of this madneſs are, when they run up-and-down their paſtures, as if they were put to the ſpur, and from time to time looking round them, they ſeem as if they were ſeeking for, and wanted ſomething. This phrenſy of theirs is removed, if you lead them to the water; then, beholding at length their own uglineſs, they aboliſh and loſe the remembrance of their former image. What has been ſaid concerning mares in general may ſuffice. The following directions in particular muſt be given to thoſe, who make it their buſineſs to breed and bring up herds of mules.

CHAP. XXXVI.

Of Mules.

IN educating the mule-kind, the firſt and principal thing to be done is, carefully to inquire after, and find out, a male and female parent of the future offſpring, of which, if either the one or the other be unfit for the purpoſe, even that which is formed of the two decays, and comes to nought. It is proper to chuſe a mare of any age under ten, as long as ſhe is of the largeſt and the moſt beautiful ſhape, with ſtrong members, and exceeding patient of labour, that ſhe may eaſily receive and bear the full time the plant of a ſtrange and different kind, that is ingrafted into her, and is diſcordant to her womb; and may communicate to her offſpring not only the good qualities of her body, but alſo thoſe of her natural diſpoſition and temper; for not only the ſeeds, which are thrown into the genital parts, are animated with difficulty, but alſo, after they are brought to conception, they are longer in growing ripe for the birth, and are ſcarcely brought forth in the thirteenth month, after the full year is paſt; and there is more of the paternal dulneſs and ſluggiſhneſs, than of the maternal vigour, inherent in the offſpring.

Nevertheleſs, as mares are found with leſs care for the foreſaid uſes, ſo there is greater trouble in chuſing a male, becauſe oft-times the ex-

they made another coarſer ſauce, which they called *alex*. In *Pliny*'s time, the moſt eſteemed of any was that made of *ſcombri*, which, ſome ſay, is a ſort of mackrel, which they brought from *Spain*, and from an iſland near *Carthage*, which, from that fiſh, they called *ſcombraria*; ſo that this exquiſite liquor, as he ſays, *lib.* xxxi. *c.* 8. was made of the guts of fiſh, and other things, which were proper to be thrown away, macerated in ſalt; and that it was the juice that iſſued out of them when they were beginning to putrify.

periment fruſtrates the expectation, and does not ſucceed according to the opinion of him that approved him. Many ſtallions, of a wonderous beautiful outward appearance (1), do generate a low mean race, either as to their form or ſex; for, whether they procreate females of a ſmall body, or more males alſo than females of a beautiful body, they diminiſh the income of the maſter of the family: but ſome, of a contemptible aſpect, are productive and full of moſt precious ſeeds. Sometimes there are ſome of them, which convey their excellent and noble qualities to their offſpring: but, being dull and ſlow to pleaſure, are very rarely provoked to venery. To a male of this temper the Keepers ought to bring near, by degrees, a female of the ſame kind, becauſe nature has made animals, that are alike, more familiar with their like; for ſo it is brought about, that, by throwing the female in his way, when the male alſo is ſoothed into good humour by leaping upon her, being, as it were, ſet on fire, and blinded with luſt, after they have withdrawn her, which he had a liking to, and ſought after, he may be put upon the mare, which he had an averſion to.

CHAP. XXXVII.

Of reſtraining the Cruelty of a Stallion, mad upon gratifying his Luſt.

THERE is alſo another kind of ſtallion, who runs furiouſly to the gratification of his luſt, which, if he is not artfully reſtrained, proves deſtructive to the ſtud; for oft-times, having broken his bonds, he diſquiets thoſe that are with young; and, when he is admitted, he faſtens his teeth in the necks and backs of the females. To prevent his doing of this, they bind him a little while to the mill, and moderate the cruelty of his love with labour, and ſo admit him to venery when he is become more modeſt. Nevertheleſs a ſtallion alſo, that is of more clemency in his libidinous gratifications, is not to be admitted upon other terms, becauſe it is of much importance, that the naturally drouſy and dull diſpoſition of this beaſt be put in motion and rouſed by moderate exerciſe; and that the male, when he is made more lively and briſk

(1) *Multi admiſſarii ſpecie tenus mirabiliſſimam.* This ſentence ſeems to be imperfect; and, in order to make it intelligible, *mirabiliſſimam* muſt be changed into *mirabiles peſſimam*, or, as *Geſnerus* corrects it, *mirabiles imam*, which will make it very conſiſtent.

than uſual, be joined to the female, that ſo the ſeeds themſelves may, by a certain ſecret efficacy, be formed and faſhioned of more lively and active principles.

But a mule is generated not only of a mare and an he-aſs, but alſo of a ſhe-aſs and an horſe, and of a wild he-aſs and a mare. But ſome authors not to be concealed, as *Marcus Varro*, and, before him, *Dionyſius* and *Mago*, have related, that, in ſome countries in *Africa*, the breed of mules is ſo far from being looked upon as prodigies, that their bringing forth of young is as familiar to the inhabitants, as that of mares is to us. Nevertheleſs there is none of this kind of cattle that is more excellent and valuable, either with reſpect to their diſpoſition and temper, or the form of their body, than that which is begotten by an he-aſs, altho' that which is begotten by a wild he-aſs may, in ſome meaſure, be compared to this, except that it always carries along with it the lean and ill-favoured appearance and mein of its ſire, and cannot be tamed and broken, and will not yield and ſubmit to labour, as is the temper of every beaſt that is wild. Therefore a ſtallion of this ſort is more profitable in his nephews than in his ſons; for, when one that is ſprung of a ſhe-aſs and a wild he-aſs is admitted to a mare, whatever proceeds from him, its wildneſs and fierceneſs gradually abating, retains the form and modeſty of its ſire, and the ſtrength and ſwiftneſs of its grandſire.

Such as are conceived and procreated of an horſe and a ſhe-aſs, altho' they take their name from their ſire, being called *hinni* (1), are, in all things, more like their dams; therefore it is moſt advantageous to deſtinate an he-aſs for procreating the mule-kind, the breed of which (as I ſaid) is found by trial to be of a more goodly, ſightly and beautiful appearance. Nevertheleſs he ought not otherwiſe to be approved of from his aſpect, but by his being of a very large body, with a ſtrong neck, robuſt and broad ribs, a muſculous and vaſt cheſt, brawny thighs, compact legs, of a black or ſpotted colour; for the mouſe-colour, as it is very common in an he-aſs, is not very ſuitable alſo in a mule. Neither let the outward appearance of the four-footed beaſt in general deceive us, if we behold him ſuch as we approve; for in the ſame manner as the ſpots, which are in the tongues and palates of rams, are found, for the moſt part, in the fleeces of lambs, ſo, if the he-aſs carries hairs of a different colour in his eye-lids or ears, he frequently procreates an offſpring of divers colours alſo; which colour itſelf, tho' it has been

(1) *Hinni*, ſo called from their neighing ſomewhat like a horſe, retaining ſomething of their ſire.

moſt diligently examined and ſearched for in a ſtallion, nevertheleſs oft-times deceives the owner: for ſometimes alſo, without the foreſaid ſigns, he procreates mules very unlike to himſelf, which, I think, does not happen otherwiſe, but that the colour of the grandſire, by being mixt with the primordial ſeed, is communicated and reſtored to his grandſons.

Therefore ſuch a foal of an aſs, as I have deſcribed, muſt, as ſoon as he is foaled, be preſently taken from his mother, and put under a mare, without her having any knowledge of him. She is very eaſily deceived in the dark; for her own foal being taken away from her, the foreſaid one is nouriſhed by her in a dark place, as if ſhe had foaled it herſelf. Then, when the mare has been accuſtomed to him for ten days, ſhe will always afterwards give him her dugs when he ſeeks for them. The ſtallion, being thus foſtered, learns, by degrees, to love mares. Sometimes alſo, tho' he be brought up with his mother's milk, yet, having been familiarly converſant with mares from his younger days, he may have a liking to them, and ſeek to be in their company, and be familiar with them. But one under three years old muſt not be admitted to be a ſtallion; and, if even this be allowed, it will be proper to be done in the ſpring, when he muſt be ſtrengthened both with green cut-graſs, and a large allowance of barley; and ſometimes alſo you muſt give him a drench. Nevertheleſs, he muſt not be put to a young female; for unleſs ſhe has known a male before, ſhe drives away the ſtallion with her kicking, when he leaps upon her; and when he is thus violently driven away, and ſeverely uſed, it makes him an enemy to all other mares alſo. To prevent this, they put an ignoble and vulgar little he-aſs to the female, to ſolicit her compliance. Nevertheleſs, they do not ſuffer him to cover her, but, if the mare is brought to be paſſive, they preſently drive away that of a more ignoble breed, and put her to a male of greater value, and of a more noble extraction.

There is a place built on purpoſe fort heſe uſes, (peaſants call it a machine) which has two walls built into a gently riſing ground, and at ſo ſmall diſtance the one from the other, that the female may not ſtruggle, nor turn herſelf away from the ſtallion when he leaps upon her. There is acceſs into it at both ends, but in the lower end it is ſecured and ſhut up with croſs-bars; to which the mare being bound with a halter, is placed in the lower part of the declivity, that ſo bending downward ſhe may both receive the ſeed of the ſtallion, that covers her the better, and afford to the leſſer four-footed beaſt, an eaſy aſcent to her back from the higher part. After ſhe has brought forth that which ſhe has conceived by the he-aſs, the following year, ſhe nurſes

and

and brings up her young one without being with foal again: for that is better than what ſome do, who, notwithſtanding ſhe has but lately foaled, yet fill her belly again by admitting an horſe to her. When the ſhe-mule is one year old, it is proper to drive her from her dam; and, after ſhe is removed, to paſture her upon the mountains, or in wild places, that ſhe may harden her hoofs, and be afterwards fit for long journeys; for the he-mule is fitter for the pack-ſaddle. She indeed is nimbler; but both ſexes are very proper, both for travelling, and alſo for tilling the ground; unleſs the price of the quadruped be too burdenſome an expence to the Huſbandman, or the field, with its weighty glebe, require the ſtrength of oxen.

CHAP. XXXVIII.

Of Medicines for curing Mules.

I Have already, in ſpeaking of the other kinds, taught you, for the moſt part, the medicines proper for this cattle: nevertheleſs, I ſhall not omit certain diſeaſes peculiar to mules, the remedies of which I have here ſubjoined. They give raw colewort or cabbage to a mule that has a fever. They take away ſome blood from one that is purſy, and has a difficulty in breathing, and mix about an *hemina* of the juice of horehound, with a *ſextarius* of wine and oil, and half an ounce of frankincenſe, and pour them into her. They apply barley-meal to one that is affected with the ſpavin; and afterwards, when they have opened the ſuppuration with a lancet, they cure it with linaments: or they pour into her, thro' the left noſtril, a *ſextarius* of the beſt garum, or ſalt-mackrel-brine, with a pound of oil; and with this medicine they mix the liquor of three or four eggs, after they have ſeparated the yolks from it. They ſometimes are wont to cut their thighs, and to burn them with an hot iron. They let out the blood that falls down into their feet, in the ſame manner as they do in horſes; or if they have an herb, which peaſants call *white hellebore*, they give it them for fodder. There is henbane, the ſeed of which, bruiſed, and given with wine, cures the foreſaid diſeaſe.

Leanneſs and a languor are removed by giving them frequently a potion, into which they put half an ounce of bruiſed ſulphur, and a raw egg, and a dram weight of bruiſed myrrh. They mix theſe three things with wine, and ſo pour them down their throat. But theſe ſelf-ſame things

things do equally cure a cough, and a pain of the belly. There is nothing of ſo great efficacy for leanneſs, as medic. That herb, when it is green, and even when it is dry, preſently fattens labouring beaſts: but it muſt be given moderately, leſt the cattle be ſuffocated with too much blood.

They put greaſe into a mule's chops, when ſhe is tired and exceeding hot, and pour pure wine into her mouth. As to what is further neceſſary for mules, we will put in practice the directions we delivered in the former parts of this book, which contain every thing relating to the care and management of oxen, and of mares.

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK SEVENTH.

AS we are now, *Publius Silvinus*, going to ſpeak of leſſer cattle, we ſhall begin with this leſſer, vulgar, little *Arcadian* heaſs, of ſmall value, of which moſt authors of Huſbandry think that principal account ought to be made, and the greateſt regard had to him, both in buying and managing of beaſts deſtined for labour: and not without reaſon; for he may be kept even in that farm which has no paſture, being content with a very ſmall allowance of fodder, and of any ſort whatſoever: for they nouriſh him either with leaves, or thorn-buſhes, or thiſtles, or willow-rods, or with a bundle of vine-ſprays thrown before him; but he even grows fat with ſtraw and chaff, with which almoſt all countries abound. Alſo he bears up moſt valiantly under the neglect of an imprudent keeper: he can endure blows, and ſtripes, and penury, with the greateſt patience; for which reaſons, he fails and decays more ſlowly than any other ſort of cattle whatſoever. For, being exceeding patient of labour and hunger, he is rarely affected with diſeaſes. The very many and neceſſary ſervices of this animal, beyond what comes to his ſhare, conſidering his ſize, do more than compenſate the little trouble and charges in keeping him, foraſmuch as with light ploughs he breaks up eaſy ground, ſuch as that in *Bætica* and all *Libya* is, and draws ſuch carriages as are not of too great weight. Oft-times alſo, as the moſt celebrated poet ſays (1),

——— 'The driver of the ſlow dull aſs,
'Returning from the city, loads his ribs

(1) *Virg. georg. lib.* i. 273.

With

'With cheap and paltry apples, or brings back
'His dented ſtone, or maſs of coal-black pitch.'

Now, indeed, working in mills, and grinding of corn, is almoſt the uſual and ordinary labour of this cattle: wherefore every manor whatſoever requires this little aſs, as what is exceeding neceſſary, which, as I ſaid, can very conveniently carry to town, or bring back again, either upon his back, or with his neck, moſt part of things neceſſary for uſe. But which ſpecies of them is moſt approved, or what is the moſt approved way of managing them, has been abundantly declared in the preceding book, when directions were given concerning the aſs of great price, and noble extraction.

CHAP. II.

Of Buying and Managing of Sheep.

AFTER the greater quadrupeds, ſheep-cattle are of ſecond account, which may be of firſt account, if you have regard to the greatneſs of the profit redounding from them. For this ſort of cattle chiefly protects us againſt the violence of the cold, and furniſhes comely and magnificent coverings for our bodies. Moreover, it not only ſatiates the country people with abundance of milk and cheeſe, but alſo garniſhes the tables of the elegant with agreeable and numerous diſhes. To ſome nations, indeed, which are intirely deſtitute of corn, it furniſhes their whole ſuſtenance: hence it is, that very many of the *Nomades* (1) and *Getæ* (2) are called *Galactopotæ* (milk-drinkers). Therefore this cattle, though it be exceeding delicate, as *Celſus* ſays very prudently, enjoys a very ſafe ſtate of health, and is not at all afflicted with peſtilential ſickneſs. Nevertheleſs, it muſt be choſen according to the nature of the place; which *Virgil* directs to be obſerved, not only with reſpect to this cattle, but alſo in all rural diſcipline whatſoever, when he ſays (3),

'Nor can all ſorts of lands all things produce.'

(1) *Nomades* were ſuch people in general, as ſubſiſted by feeding of cattle, and had no certain habitation, but went where-ever they could find paſture for their cattle, as the wild *Tartars*, &c.

(2) *Getæ*, a people in *Dacia*, upon the confines of *Scythia*; ſome think they were the *Moldavians*. *Pliny* ſays, that theſe *Getæ* were by the *Romans* called *Daci*.

(3) *Virg. georg. lib.* ii. 89.

'A fat

A fat and champagne country ſuſtains tall ſheep; a lean and hilly, thoſe that are ſquare and well-ſet; a woody and mountainous, ſuch as are ſmall. Covered cattle find very convenient paſture in meadows and level fallow lands.

And this direction is not only of great importance, with reſpect to the ſeveral kinds of ſheep, but alſo to their colours. Our people formerly reckoned, that the *Mileſian* (4), *Calabrian*, and *Apulian* (5) ſheep, were of an excellent kind; and that the *Tarentinian* (6) were the beſt of them. Now thoſe of *Gaul* are eſteemed more valuable; and of theſe, the *Altinian* (7) are preferred to all the reſt. Alſo thoſe which have their folds upon the lean fields about *Parma* and *Modena*. The white colour, as it is the beſt, ſo alſo it is the moſt profitable; becauſe that of it very many other colours are made; but this is not made of any other. The black and brown dark colours, which *Pollentia* (8) in *Italy*, and *Corduba* (9) in *Bætica*, furniſh us with, are of their own nature commendable for their price. Nor does *Aſia* produce leſs plenty of thoſe of a bright-red colour, which they call *Erythrean* (10).

But experience has taught to produce and expreſs other varieties alſo in this kind of cattle; for, at a certain time, when ſome wild and fierce rams of a wonderful colour, as other beaſts, were brought from the neighbouring parts of *Africa*, to the municipal city of *Cadiz*, by thoſe who entertained the people with public games and ſhews, *M. Columella* my uncle, a man of a quick diſcerning genius, and a famous Huſbandman, having bought ſome of them, carried them to his own lands, and when they were tamed, admitted them to couple with covered ſheep. Theſe, at firſt, brought forth rough briſtly lambs, but of the colour of their ſire; and afterwards they themſelves, being put upon *Tarentinian* ſheep, generated rams of a finer fleece. Moreover, whatever was afterwards conceived by them, reſembled the colour of the ſire and grandſire, but the delicacy and ſoftneſs of the dam. In this manner *Columella* ſaid that any colour or outward appearance

(4) *Mileſii* were a people in *Caria*, or *Ionia*, in the leſſer *Aſia*.

(5) *Calabria* and *Apulia*, both Provinces in the Kingdom of *Naples*; the laſt is mighty fruitful in cattle.

(6) *Tarentinian ſheep* were ſuch as were bred in the territory of *Taranto*, in the Kingdom of *Naples*.

(7) *Altinum*, now called *Altino*, in the *Venetian* territory, once a famous city at the mouth of the river *Sile*, which falls into the gulf of *Venice*.

(8) *Pollentia*, once a famous town, but now ruinous, upon the River *Tanaro*, in that part of *Italy* formerly called *Liguria*. The country about it was famous for black ſheep.

(9) *Corduba*, now called *Cordova*, a very famous city upon the river *Bætis* in *Spain*.

(10) *Erythrean wool*, ſo called from its reddiſh colour, ἐρυθρὸς, red.

whatſoever, that was in beaſts, did return with a mitigation of their fierceneſs and wildneſs, through the ſeveral degrees of their deſcendants. I ſhall return to what I propoſed.

Now there are two kinds of ſheep-cattle; the ſoft and delicate, and the rough and briſtly. But, in buying both the one and the other, there are ſeveral things that are common to both. Nevertheleſs, there are ſome things that are peculiar to the noble and excellent kind, which it may be proper ſhould be obſerved. In buying flocks, the following are the things, for the moſt part, which ought to be obſerved in common. If the whiteneſs of the wool pleaſes you moſt, you ſhall always chuſe the whiteſt males: for, of a white male, there is often produced a dark tawny offspring; but that which is white is never generated by one that is red or black.

CHAP. III.

Of chuſing Rams.

THerefore the way to judge and approve of a ram, is not only that of obſerving if he is cloathed with a white fleece, but alſo, if his palate and tongue are of the ſame colour with his wool: for, when theſe parts of his body are black or ſpotted, there ariſes a black or ſpeckled offspring. And this, among other things, the ſame poet I mentioned above, has excellently pointed out in ſuch numbers as theſe (1):

'Reject him, tho' the ram himſelf be white,
'Under whoſe ouſy palate lies conceal'd
'A black or ſpotted tongue; for with black ſpots
'He'll ſtain the fleeces of his future race.'

One and the ſame reaſon holds with reſpect both to *Erythrean* and black rams, of which (as I have already ſaid) no part ought to be of a different colour from the wool, and much leſs their whole ſkin be chequered with ſpots: therefore we muſt never buy ſheep, except they have their wool upon them, that ſo the unity of their colour may the better appear; which unleſs it be particularly remarkable in rams, the paternal ſpots, for the moſt part, are inherent in their offspring.

(1) *Virg. Georg. lib.* iii. 387.

But

But the make of his body is moſt approved, when it is high and tall, with an hanging-down and woolly belly, an exceeding long tail, and of a thick fleece, with a broad forehead, large teſticles, twiſted horns; not becauſe this laſt is more uſeful, (for a ram without horns is better) but becauſe horns that are twiſted and bended inwards are not at all ſo hurtful, as thoſe that are ſet upright and expanded. Nevertheleſs, in ſome countries, where the climate is wet and windy, we would wiſh for he-goats and rams even with the very largeſt horns; becauſe, when they are high and extended, they defend the greateſt part of the head from the ſtorm. Therefore, if for the moſt part the winter is violently cold, we will chooſe this kind; but, if it be milder, we ſhall approve of a male that has no horns; becauſe there is this inconveniency in one that is horned, that when he perceives himſelf armed, as it were, with a certain natural weapon upon his head, he frequently ruſhes out to battle, and becomes more ſaucy and frolickſome with the females: for he perſecutes his rival moſt violently, tho' he alone is not ſufficient for ſerving the whole flock; nor will he ſuffer the flock to be ſerved in due time by any other, except when he is fatigued with luſt. But one that has no horns, when he knows himſelf to be as it were diſarmed, is neither ſo ready to quarrel, and is more gentle in his amours. Therefore ſhepherds check the cruelty of a miſchievous he-goat or ram, by this cunning contrivance; they ſtick a ſtrong board of one foot meaſure full of pricks, and bind it to his horns with the points towards his forehead. This thing reſtrains one that is fierce from quarrelling, when he is pricked, and wounds himſelf with his own blow. But *Epicharmus* the *Syracuſian*, who wrote very carefully of the art of curing cattle, and of the medicines that are proper for them, affirms that a fighting quarrelſome ram is tamed by having his horns bored with a gemlet, hard by his ears, where they are firſt crookened in the bending. The beſt age of this quadruped for procreating, is when he is three years old: nor yet is he unfit for it till he be eight years.

The female ought to be joined to an huſband after ſhe is two years old, and ſhe is reckoned to be young and in her prime, when ſhe is five years old: after her ſeventh year ſhe begins to decline. Therefore, as I ſaid, you ſhall purchaſe ſheep that are not ſhorn: you ſhall reject the grey and ſpeckled hair, becauſe it is of an uncertain colour: you ſhall refuſe the barren one, that threatens you with her three-year-old tooth: you ſhall chooſe her that is two years old, and of a huge body, with a long neck, long wool, but not harſh and coarſe, with a woolly

and large belly; for an ewe with a peeled, bare, and very ſmall belly, muſt be avoided.

And theſe almoſt are the things in common to be obſerved in purchaſing ſheep: alſo thoſe following are to be obſerved in keeping and managing them, *viz.* that their folds be low, but rather extended in length than in breadth, that they may be both warm in winter, and the ſtraightneſs of the place may not make them caſt their young: and they ought to be placed againſt the ſouth; for this cattle, tho' of all animals it is the beſt cloathed, is nevertheleſs moſt impatient of cold, and no leſs of the heat of ſummer. Therefore, a cloſe ſurrounded with an high wall, ought to be placed before their porch, that they may go out into it with ſafety, and ſummer in the cool; and let care be taken, that no moiſture remain in it, and that their folds be always ſtrewed with very dry ferns or ſtraw, that ſo the ewes, that are with young may lie the cleaner, and the ſofter. Let their baſkets be exceeding clean (2), that their health, which is chiefly to be taken care of, may not be impaired with any kind of moiſture.

But large allowances of food muſt be given to all ſorts of ſheep: for even a very ſmall number, when ſatiated with food, yields more to their owner, than the greateſt flock, if they be pinched with want. But you muſt endeavour to find for them fallow-grounds, that are not only graſſy, but which, for the moſt part, are void of thorns; and let us often make uſe of the authority of that divine poem (3):

'If wool's thy care, then firſt from prickly woods,
'And briars, and thorns, and burs, thy tender flock
'Keep at a diſtance.' ———

For, as the ſame poet ſays, this thing makes the ſheep ſcabby:

'When to their ſkin, which in a wholſome ſtream
'Has not been waſh'd when newly ſhorn, the ſweat
'Adheres; and when, with prickly briers and thorns,
'Their tender bodies wounded are and torn.'

(2) *Quala mundiſſima.* Some think, that the true reading is *illa*, inſtead of *quala*, referring to *ſtabula*, viz. that their folds be kept clean and dry, without any moiſture to impair their health: and indeed it is not eaſy to conjecture, why the author ſhould bring *quala* into this place, unleſs by it be means ſome cloſe baskets, wherein they gave them fodder in hard weather; but in common fodder-baskets no moiſture could remain, that could be hurtful to them.

(3) *Virg. Georg. lib.* iii. 384. 442.

Moreover,

Moreover, their wool is thereby daily diminiſhed, which how much the longer and thicker it grows upon the cattle, ſo much the more obnoxious is it to the brambles, which catch it as it were with ſo many hooks, and pull it from their ſkins while they are feeding. The delicate ſheep alſo loſe the covering wherewith they are provided, and that is not repaired with a ſmall expence.

Almoſt all authors are agreed, that the ſpring-time, when the feaſt of *Pales* (4) is celebrated, is the moſt proper for admitting the ram, if it be an ewe juſt come to maturity; but, if ſhe has already had a lamb, about the ninth of *July* is the proper time. Nevertheleſs, it is not to be doubted, the firſt is more to be approved of; that as the vintage follows the harveſt, ſo the yeaning-time may ſucceed to the gathering in of the fruit of the vine; and the lamb, being ſatiated with the fodder of the whole autumn, may become ſtrong before the melancholy colds, and the faſting-days of winter approach: for a lamb, yeaned in autumn, is better than one in the ſpring, as *Celſus* ſays very truly, becauſe it tends more to our advantage, that he grow ſtrong before the ſummer ſolſtice, than before that of winter: and of all animals he alone ſuffers no inconveniency, by being brought forth in the middle of winter. And if our preſent occaſion requires, that moſt males ſhould be procreated, *Ariſtotle*, a man exceedingly well acquainted with the nature of things, directs us to obſerve and watch for the northern breezes in dry weather, at the time when the rams are admitted; that we may feed the flock againſt the wind, and that the cattle may take the ram when they are looking towards it: but, if females are to be generated, he directs us to catch the ſouthern breezes, that the rams may leap upon the ewes in the ſame manner. For that which we taught in the preceding book, that the right, or even the left, teſticle of the ram which ſerves the flock, be tied up with a band, is too great a labour in great flocks.

Then, after the yeaning-time is paſt, when the ſhepherd is preparing to go to paſtures of a far diſtant quarter, let him reſerve almoſt all the young offſpring for the paſtures that are contiguous to the city; for the bailiff delivers the young lambs to the butcher, before they have taſted any graſs, becauſe they are carried thence at a very ſmall charge; and, after they are taken away, the advantage accruing from their mother's milk is not diminiſhed. Nevertheleſs, it is neceſſary ſometimes to bring up lambs for a new breed, even in the neighbourhood of the

(4) *Parilia*, or *Palilia*. Among the *Romans*, *Pales* was the goddeſs of ſhepherds, under whoſe protection they ſuppoſed ſheep were. Her feaſt was celebrated the 18th day of *April*, with great ſolemnity, as we ſee in *Ovidii Faſti*, *Servius* upon *Virgil*, and others.

city:

city: for cattle bred and brought up in our own country, is much more profitable than that which is brought from another country. Nor ought ſuch an error ever to be committed, as to ſuffer the whole flock to wear out and decay with old age, and leave the owner intirely deſtitute, eſpecially conſidering, that it is the very firſt buſineſs of a good Shepherd to ſubſtitute as many or more heads, in the room of thoſe that are dead or diſeaſed; becauſe, oft-times, the ſeverity of the colds, and the rigour of the winter, deceives the Shepherd, and kills and deſtroys thoſe ſheep, which he, in the time of autumn, thinking they were ſtill tolerable, had not drawn out of the flock. And ſo much the more, becauſe of theſe accidents, let the number be filled up only with the ſtrongeſt and new progeny, which may not be much affected with the winter. Whoſoever will do this, ought conſtantly to obſerve, not to commit the bringing up of her own offſpring to any ewe that is under four, nor to one that is above eight years old: for neither the one nor the other age is proper for educating young ones; as alſo that which ſprings out of old materials, for the moſt part, brings along with it the old age of its parent, blended with its conſtitution; for it is either barren or weakly.

And they ought to watch the time the cattle begins to bring forth, with no leſs care than a midwife uſes to do: for this animal does not bring forth otherwiſe than our female ſex does; and inaſmuch as it is intirely ignorant, and deſtitute of all reaſon, ſo much the more frequently it labours, and is in danger, in bringing forth. Wherefore an Overſeer of cattle ought to be expert in that ſort of phyſic which belongs to a Farrier, that, if neceſſity requires, he may either pull out the conception intire, when it ſticks croſſways in the genitals, or bring out the young one after he has divided it with an inſtrument, without deſtroying the mother, which the *Greeks* call, ἐμβρυολχεῖν. But the lamb, after it is yeaned, ought to be ſet upon its feet, and put to the udder; and its mouth ought to be opened and moiſtened, by ſqueezing the milk out of the nipples into it, that it may learn to draw nouriſhment from its mother. But, before that be done, a little of that which the Shepherds call *Beeſting-milk*, muſt be milked out; for, unleſs this be ſqueezed out, it hurts the lamb, which ought to be ſhut up with its dam for two days after he is yeaned, that both ſhe may cheriſh her own offſpring, and it may learn by degrees to know its mother. Then afterwards, as long as he does not friſk and play about, let him be kept in a dark and warm fold. Afterwards, when he grows too frolickſome, he muſt be ſhut up with thoſe of his own age, in an area incloſed with wattles, that he may not grow lean with his too much

ſkipping

ſkipping and leaping as it were: and care muſt be taken, that the more tender be ſeparated from the ſtronger, becauſe the robuſt vexes and torments the weak. And it is ſufficient to mix the lambs with the ewes in the morning before the flock goes forth to the paſtures; and then in the evening alſo, when they return with their bellies full.

And, when the lambs begin to be ſtrong, they muſt be fed within the fold, with ſhrub-trefoil, or medic; as alſo with bran; or, if the price of corn may permit it, with barley-meal, or with that of bitter vetches: then, after they are grown up, their dams muſt be brought to the meadows or fallow lands, that are contiguous to the manor-houſe; and the lambs be let out of their folds, that they may learn by degrees to feed abroad. As we have already ſpoken of that kind of food which is proper for them, we ſhall take notice of thoſe things which have been omitted, and obſerve, that the ſweeteſt herbs are thoſe which grow in corn-lands, whioh have been cut up with the plough; next, ſuch as grow in meadows which are not ouſy; but ſuch as grow in marſhes and woods are not at all reckoned proper for them. Nevertheleſs, there are no ſorts of fodder whatſoever, nor even paſtures, ſo pleaſing and agreeable, which, with continual uſe, do not grow ſtale, and loſe their agreeableneſs, unleſs the Shepherd prevent the nauſeating of the cattle, by giving them ſalt, which being laid in wooden troughs, during the ſummer, to be as it were a ſeaſoning for their fodder, the ſheep lick it up when they return from the paſture, and, by the taſte of it, conceive a deſire of drinking and feeding. But, on the other hand, they relieve them from the ſcarcity and want of fodder during the winter, by throwing food before them in racks within the houſe: and elm- or aſh-leaves, or autumnal hay, which they call after-graſs, laid up for them, are very convenient food for them; for this ſort of hay is ſofter, and upon that account ſweeter, than that which is full grown, and firſt cut. Shrub-trefoil and common vetches are alſo excellent food for them: nevertheleſs, chaff or ſtraw alſo, even of any ſort of puls, are neceſſary when other things have failed: for barley by itſelf, or the bean bruiſed with its pods, or the chichling, are more chargeable, than that they can be given to them at a ſmall price in countries contiguous to the city; but, if the lowneſs of their price allows it, without doubt they are beſt.

But as to the times of feeding them, and leading them to water, I do not differ in my opinion from what *Maro* has delivered (5):

'Soon as the fulgent Morning-ſtar appears,

(5) *Virg. Georg. lib.* iii. 324. *& ſeq.*

'And while the morning's new, while graſs is grey,
'And dew diſtilling from each tender herb
'Is ſav'ry, and invites the flocks to eat;
'Let us conduct them to cold ſpacious fields;
'And, when the fourth hour of the day has rais'd
'Their thirſt, then thence to wells, or to deep pools,

let us lead them; and, in the middle of the day, as the ſame poet ſays, let us conduct them to a valley,

'Where *Jove*'s huge oak, with years made hard and ſtrong,
'Its mighty boughs extends; or gloomy grove,
'With thick-ſet holms ſecur'd from *Phœbus*' rays,
'Its ſacred ſhade ſpreads on th' adjacent ground.

Then, after the heat is abated, let us drive them again to water, and lead them out to the paſtures a ſecond time,

'Till ſun goes down, when the cold Ev'ning-ſtar
'Allays the heat, and dew-diſtilling moon
'Repairs the foreſts.'

But, about the time that the Dog-ſtar firſt ſhews itſelf, we muſt take particular notice of the ſun, that before noon we drive our flock with their heads to the weſt, and that they advance toward that part, and in the afternoon toward the eaſt: for it is of very great importance, that their heads be not turned exactly toward the ſun when they are feeding, which for the moſt part is hurtful to animals when the foreſaid ſtar is riſing.

In winter and ſpring let them be kept in their ſheep-cotes during the morning, till the ſun removes the froſts from the fields: for, in theſe days, graſs with hoar-froſt upon it gives the cattle a great heavineſs and ſtuffing in their heads, and brings a looſeneſs upon them; wherefore, in moiſt and cold times of the year alſo, they muſt be allowed to drink only once a day. Alſo let him who follows the flock be vigilant and circumſpect, and (which is given as an injunction to all keepers of all four-footed beaſts whatſoever) let him govern and rule over them with great clemency, and let this ſame perſon be more like a captain and leader, than a lord and maſter; and both when he gathers his ſheep together, and houſes them, let him threaten them with a loud ſhout, and with his ſtaff, but never throw any offenſive

weapon at them, nor return to any great diſtance from them; neither let him either lie down, nor ſit down: for, unleſs he is going forward, he ought to ſtand; becauſe, indeed, the duty of a Keeper requires, that he be always as it were upon a high and lofty watch-tower, that he may turn his eyes every way, and neither ſuffer thoſe that are ſlow and great with young, while they loiter, nor thoſe that are nimble, and have already brought forth, while they run before, to be ſeparated from the reſt; leſt either a thief, or a wild beaſt, deceive the heedleſs unattentive Shepherd. But theſe things relate in general almoſt to all ſheep-cattle whatſoever. Now we ſhall ſpeak of ſuch things as are peculiar to the generous kind.

CHAP. IV.

Of covered Sheep.

IT is ſcarcely any advantage at all to have *Greek* cattle, which moſt people call *Tarentinian*, in one's poſſeſſion, except when the owner is actually preſent himſelf; conſidering that they require both greater care, and a greater allowance of food: for inaſmuch as the wool-bearing kind in general is more tender and delicate than any other cattle whatſoever, ſo the *Tarentinian* is the moſt tender and delicate of them all, which cannot bear with any manner of ſlothfulneſs, either of their owner or keepers, and much leſs with their covetouſneſs; and it can neither endure exceſſive heat nor cold. They are ſeldom fed without doors, but for the moſt part in the houſe; and they are exceeding greedy of food, of which if any part be withdrawn by the villainy of the Bailiff, ruin and deſtruction follow the flock. During winter, they are fed very well at their cribs with three *ſextarii* of barley, or of beans bruiſed with their own huſks, or with four *ſextarii* of chichlings each head, but ſo as to give them likewiſe dried leaves, or dry or green medic, or ſhrub-trefoil; as alſo ſeven pound weight of ſecond-crop-hay, or chaff of pulſe in abundance.

There is the leaſt advantage to be had by ſelling the lambs of this kind of cattle, nor can any be made by their milk; for ſuch of them as ought to be removed from their dams, are killed for the moſt part a very few days after they are yeaned, before they come to maturity; and their mothers, being bereaved of their own young ones, give ſuck to the offſpring of a ſtranger: for each lamb is put to be ſuckled and brought up by two nurſes, nor is it expedient, that any thing be with-

drawn from ſuch as are put to be ſuckled and brought up, that ſo the lamb, being fuller fed, and glutted with milk, may quickly grow ſtrong; and the ewe which brought it forth, being aſſociated with a nurſe, may labour leſs in the education of her own offspring. For which reaſon you muſt be very careful to obſerve, that the lambs be put daily both to the dugs of their own dams, and alſo to thoſe of others, that are ſtrangers to them, and do not love them.

But, in flocks of this kind, you muſt nouriſh and bring up more males, than in thoſe which have coarſe hairy wool: for the males, being caſtrated before they can couple with the females, are killed when they are two years old complete; and their ſkins are delivered to the merchants, at a greater price than other fleeces, becauſe of the exquiſite beauty of the wool. But we muſt remember to feed our *Greek* ſheep in free open fields, void of all manner of buſhes, ſprigs, or briars, leſt, as I ſaid above, both their wool and their covering be pnlled off them; nor yet do they require leſs diligence and care without doors, becauſe they ſeldom go forth to the paſtures, but greater care and attendance at home; for they muſt be frequently uncovered, refreſhed, and cooled: their wool muſt be frequently opened and parted, and moiſtened with oil and wine: ſometimes alſo they muſt be waſhed all over with water, if the mildneſs and brightneſs of the day permit it; and it is enough, if that be done three times a year. But the ſheep-cotes muſt be often ſwept and cleanſed, and all the moiſture of their urine conveyed away, which is very conveniently dried up by boring holes in the boards wherewith the floors of the ſheep-houſes are laid, that the flock may lie upon them: and let their houſes be freed not only from mire, and dirt, and dung, but from deſtructive ſerpents alſo: and, that this may be done, (1)

'Strong-ſcented cedar likewiſe learn to burn
'Within thy folds; and, with the burning ſmell
'Of *Galbanum*, the hurtful ſnakes purſue,
'And drive them thence; for oft, below the cribs
'Unmov'd, a deadly viper lurks unſeen,
'Which frighted ſhuns the light, and hurts when touch'd;
'Or adder, which is wont to haunt the houſe.

Wherefore, as the ſame poet commands,

'Shepherd! lay hold on ſtones, and oaken clubs;
'And, when his threat'ning head, and hiſſing neck,
'Swelling with rage, he rears, then lay him flat.'

(1) *Virg. Georg. lib.* iii. 414.

Or,

Or, that it may not be neceſſary to do this with danger, burn womens hair, or harts horns frequently, the ſmell of which, moſt of any thing, will not ſuffer the foreſaid peſt to harbour in the ſheep-cotes.

A certain fixed time of the year cannot be obſerved in all countries for ſhearing ſheep; becauſe the ſummer does neither advance ſlowly every-where, nor yet quickly; and the beſt way is, to conſider the ſeaſons, and the ſtate of the weather, wherein the ſheep may neither feel the cold, if you ſtrip it of its wool, nor the great heat, if you do not as yet ſhear it. But, at what time ſoever it ſhall be ſhorn, it ought to be anointed with ſuch a medicament as this. The juice of throughly boiled lupins, and the dregs of old wine, and the dregs of oil, of each an equal quantity, are mixed together; and with this liquor the ſheep is ſoaked, after it is ſhorn; and when its ſkin has imbibed the medicaments, after it has been anointed with them for three days, upon the fourth day, if the ſea is in the neighbourhood, let it be led to the ſea-ſhore, and dipped therein; but, if otherwiſe, they boil rain-water a little, after it has been hardened with ſalt in the open air for this purpoſe, and waſh the flock throughly therewith. *Celſus* affirms, that cattle treated after this manner cannot become ſcabby during that year; nor is there any doubt, but that even by ſo doing, and for that reaſon, their wool may grow again both ſofter and longer.

CHAP. V.

Of Remedies for Sheep-cattle.

FOraſmuch as we have already given an account of the way of managing and taking care of ſuch as are in a good ſtate of health, we ſhall now give directions after what manner ſuch as labour under any ailments or diſeaſe, muſt be relieved; although that part of our argument has been already almoſt wholly exhauſted, when we diſcourſed, in the preceding book, of remedies proper for greater cattle. For, conſidering that the nature of the bodies of leſſer and greater quadrupeds is almoſt the very ſame, the differences that can be found in their diſeaſes and remedies are but few and ſmall, which, how inconſiderable ſoever they may be, ſhall not be omitted by us.

If all the cattle in general are ſick, as we both directed before, and now (becauſe we think it moſt ſalutary for them) we again confidently affirm it, in this caſe (which is the moſt ſpeedy and effectual remedy)

let us change the paſtures and the watering-places of the whole country, and go to another climate, and a different conſtitution of the air; and take care, if the plague which has attacked them, has had its riſe from ſcorching heat, to make choice of fields that are ſhady, and defended from the ſun; or, if it ſeized them from cold, then ſuch as are expoſed to the ſun. But the cattle muſt be driven ſoftly, and without hurrying them, leſt their weakneſs be over-burdened and oppreſſed with long journeys. Nevertheleſs, you muſt not drive them altogether in a ſlow and lazy manner; for as it is not proper vehemently to toſs and drive cattle that are weary with their diſeaſe, and to put them upon the ſtretch, ſo it is an advantage to them to give them moderate exerciſe, and to rouſe them when they are as it were benumbed, and not ſuffer them to grow old, and be conſumed with drowſineſs and ſloth: then, when the flock is brought to the place, let it be diſtributed to the Peaſants in parcels; for they recover their health more eaſily when they are ſeparated, than when they are all together, either becauſe the infectious ſteam of the diſeaſe is leſſer in a ſmall number, or becauſe greater care is more expeditiouſly taken of a few. Theſe therefore, and the other things (that we may not now repeat the ſame things) which we have made mention of in the preceding book, we ought to obſerve, if all our ſheep in general are ſick; but if only ſome of them in particular, then thoſe following things are to be obſerved:

Sheep are more frequently infeſted with the ſcab, than any other animal whatſoever; which commonly affects them, as our poet ſays (1),

> 'When a cold ſhow'r, or winter's hoary froſt,
> 'Sink thro' their wool, and pierce them to the quick.'

Or if, after ſhearing them, you do not apply the foreſaid medicine as a remedy; or if you do not waſh away the ſummer ſweat in the ſea, or in a river; or if you ſuffer the flock, after it is ſhorn, to be wounded with the wild bramble-buſhes and thorns; if you make uſe of a ſtable wherein mules, horſes, or aſſes, have ſtood; but eſpecially a ſcanty allowance of food cauſes leanneſs, and leanneſs the ſcab. When this has begun to creep in among them, it is known thus: The cattle either ſcratch the part affected with their teeth, or thump it with their horn or hoof, or rub it againſt a tree, or wipe it upon the walls; which when you ſhall ſee any of them doing, you muſt lay hold of them, and

(1) *Virg. Georg. lib.* iii. 442.

open

open their wool; for below it the ſkin is rough, and there is as it were a certain ſcurf under it, which you muſt apply a remedy to, as ſoon as poſſible, leſt it defile and infect the whole progeny; and indeed it muſt be done quickly, foraſmuch as both other cattle alſo, but eſpecially ſheep, are afflicted with contagious diſtempers.

But there are very many medicines for curing them, which we ſhall therefore enumerate, not becauſe it may be neceſſary to uſe them all, becauſe in ſome countries ſome of them cannot be found; and out of many, ſome one being found, may prove a remedy. But, in the firſt place, that compoſition, which we explained and informed you of a little before, does exceeding well, if with the dregs of wine, and the ſcum or dregs of oil, and the juice of boiled lupins, you mix white hellebore, bruiſed in equal quantity. Alſo the juice of green hemlock is effectual to remove ſcabbineſs; which, in the ſpring-time, when it has begun to make its ſtalk, but not its ſeeds, they cut down, and bruiſe, and put up in an earthen veſſel the juice they have ſqueezed out of it, after they have mixed half a *modius* of toaſted ſalt with two urns of the liquor. And, when this is done, they pitch the veſſel well, and bury it in a dunghil; and after it has been concocted for a whole year with the heat of the dung, they afterwards take it out, and, having warmed the medicine, they anoint the ſcabby part therewith, which they firſt reduce to a ſore, by rubbing it with a rough tile or potſherd, or with a pumice-ſtone.

Lees of oil, boiled in two thirds, is a remedy for the ſame diſtemper. Alſo a man's ſtale urine, heated with red-hot tiles. Nevertheleſs, ſome people ſet the urine itſelf upon the fire, and thereby leſſen it one fifth part, and mix with it an equal quantity of the juice of green hemlock; and then, upon potters veſſels bruiſed, they pour melted pitch and parched ſalt, of each, one *ſextarius*. An equal quantity of bruiſed ſulphur and liquid pitch, boiled into a conſiſtency with a ſlow fire, has alſo good effect. But the *Georgic* poem affirms, that there is not a more excellent remedy, than (2)

'With piercing lancet to rip up the ſore,
'Where next the top it opens. This diſeaſe,
'If hid, new life and nouriſhment receives.'

Therefore it muſt be laid open, and cured with medicines, as other wounds are. Then it preſently adds, with equal prudence, that, when

(2) *Virg. Georg. lib.* 3. 453.

ſheep

ſheep have a fever, they muſt be let blood in the paſtern, or between the hoofs; for indeed

'For, to allay the fever's burning heat,
'It has availed much, the leaping vein,
'Turgid with blood, below the foot to ſtrike.'

We let them blood alſo under their eyes, and in their ears.

Boils alſo infeſt ſheep two different ways, either when the *foul* and the chafe-gall ariſe in the very dividing of the hoof; or when there is a tubercle or ſwelling in the ſame place, almoſt in the middle of which there appears hair like that of a dog; and under it there is a ſmall worm. The *foul* and chafe-gall may be rooted out, by anointing them with liquid pitch by itſelf; or with alum, and ſulphur and vinegar mixed together; or with a tender pomegranate, before it make its grains, with brayed alum, and vinegar poured upon it; or with the green ruſt of copper reduced to a powder; or a burnt gall allayed with rough wine, and placed upon the part. The little ſwelling, under which there is a worm, muſt be, with as much caution as poſſible, cut off all round with a knife, leſt, while we are cutting it off, we wound the animal alſo which is below; for when that is wounded, it ſends forth a putrified, poiſonous, bloody matter, which, when the wound is beſprinkled with it, makes it ſo incurable, that the whole foot muſt be cut off: and, after you have cut it carefully off, drop burning hot tallow from a burning torch into the wound.

It is proper, that a ſheep diſeaſed in her lungs ſhould be cured in the ſame manner as an hog, by inſerting into its auricle what the farriers call *lungwort*. We ſpoke of it already, when we gave an account of ſuch medicines as are proper for greater cattle, But that diſeaſe is for the moſt part contracted in ſummer, if they have wanted water; for which reaſon, all quadrupeds whatſoever ought to have liberty to drink plentifully in hot weather. *Celſus* adviſes, if the ſheep has any diſeaſe in its lungs, to give it as much ſharp vinegar as it can bear; or to pour into it with an horn, thro' its left noſtril, about three *heminæ* of ſtale human urine warmed, and to put into their jaws two ounces of greaſe. Alſo wild-fire, which ſhepherds call *puſula* (3), is incurable;

(3) *Ignis ſacer.* This diſeaſe is commonly called *St. Antony's Fire*; and *ſacer*, contrary to its common ſignification, is ſuppoſed to ſignify the ſame thing as *execrandus, ſceleſtus, abominandus, exitialis*, curſed, deſtructive, abominable, *&c.* Some call it *eryſipelas*, or rather, as *Pollux*, *eruthropelas*; which is more expreſſive of the nature of the diſtemper, which they define, a *redneſs with a burning inflammation, attended with a fever*, &c. The *Roman* Shepherds called it *puſula*, by which they meant, no doubt, a bliſter with *pus* in it.

which, unleſs it be checked and confined to the firſt ſheep that has been ſeized with ſuch a diſeaſe, deſtroys the whole flock with its contagion, foraſmuch as it does not admit of any cure, either with medicines, or the knife: for, at every touch almoſt, it grows angry, and is more and more inflamed; only a fomentation of goats milk it does not make light of, which, when poured upon it, is only able to mitigate its fiery fierceneſs and rage, rather deferring than hindering the intire deſtruction of the flock. But *Bolus Mendeſius*, a memorable *Egyptian* author, whoſe commentaries, which in *Greek* are called ὑπομνήματα (4), are falſly publiſhed under *Democritus*'s name, adviſes for this frequently and carefully to view and examine the backs of the ſheep, that if by chance ſuch a diſeaſe ſhould be found in any of them, we ſhould preſently dig a pit in the threſhold of the fold, and therein bury the ſheep infected with the wild-fire, with its face upwards; and, after it is put under ground, ſuffer the whole flock to go over it; and that by ſo doing the diſeaſe will be repelled.

Bile, which in the ſummer-time is not the leaſt deſtruction *that befalls them*, is expelled with a potion of ſtale human urine, which is alſo a remedy for cattle that have the jaundice (5). But, if phlegm be troubleſome to them, they wrap ſtalks of wild ſavory, or wild catmint, in wool, and put them into their noſtrils, and turn them to-and-fro till the ſheep ſneezes. The broken legs of cattle are not cured otherwiſe than thoſe of men, being wrapped up in wool, ſoaked in oil and wine, and preſently afterwards bound up and ſurrounded with ſplints of fennel-giant. Knot-graſs (6) is alſo a grievous plague to them,

(4) Ὑπομνήματα ſometimes ſignify a man's own private notes and obſervations for his own uſe; ſometimes they ſignify what the *Romans* called *commentarium*, that is, a writing, wherein the heads only, and ſummaries of things, are touched upon, and which are written rather for the ſake of memory, than in order to a full narration of things. Sometimes alſo they ſignify annotations or commentaries upon any author. Here, to be ſure, they muſt ſignify ſhort commentaries, or ſummaries of things.

(5) *Pecus arcuatum*, or *arquatum*. This diſeaſe in cattle has its name from the rainbow, becauſe ſome parts of their bodies, eſpecially their eyes, loſe their natural colour, and become yelloviſh or greeniſh.

(6) *Herba ſanguinaria*. This herb was ſo called by the *Latins*, as *Pliny* ſays, becauſe it ſtops a bleeding at the noſe, by putting the juice of it up the noſe; and by drinking the juice of it with wine, they uſed to ſtop a flux. The *Greeks* called it *polygonon*, as ſome ſay, becauſe it grows and ſpreads every-where. Some call it *polygonaton*, becauſe of its many joints and knots; which ſeems to be the reaſon, why it is called in *Engliſh knot-graſs*. *Matthiolus* ſays, that the male ſort, which creeps upon the ground, grows in the fields, areas of buildings, highways, and every-where; but the female, which grows up into a ſtalk, is found moſtly in well-watered and moiſt places. Our author ſays, that when a ſheep feeds upon it, *toto ventre diſtenditur, contrahiturque*; which I think muſt ſignify a ſwelling of

them, which if the ſheep feed upon, their whole belly is diſtended and bound up, and they ſpit out a certain thin foam, of a noiſome ſmell. You muſt quickly let them blood under the tail, in that part which is next the buttocks; a vein muſt be alſo opened in their upper-lip. The ears of ſuch as are purſy and broken-winded muſt be cut with a knife, and they muſt change their quarters; which we are of opinion ought to be done in all diſeaſes and plagues whatſoever.

Relief muſt be given alſo to lambs which have the fever, or are affected with any other ſickneſs; which, when they labour under any diſeaſe, ought not to be admitted to their dams, leſt they transfer the plague to them. Therefore the ewes muſt be milked apart, and an equal quantity of rain-water mixed with the milk, and that potion given to ſuch as have a fever. Many cure the ſame with goats milk, which they pour into their jaws through a little horn. The ſcab upon their chin and lips, which ſhepherds call *oſtigo*, is alſo mortiferous to ſucking lambs. This, for the moſt part, is occaſioned, if, by the imprudence of the Shepherd, the lambs, or kids alſo, being let out, have fed upon dewy herbs, which muſt not at all be allowed; but, when that is done, it ſurrounds their mouth and lips with filthy ulcers like wild-fire. Hyſſop and ſalt, bruiſed together in equal quantities, are a remedy for it; for, with this mixture, they rub throughly the roof of their mouth, and their tongue, and their whole mouth. Preſently after, they waſh the ulcers with vinegar, and then anoint them all over with liquid pitch and hogs greaſe. Some think proper to mix a third part of braſs, or copper ruſt, with two parts of hogs lard, and to uſe this medicine after it is warmed. Some mix with water the leaves of the cypreſs-tree bruiſed, and ſo waſh their ulcers, and the roof of their mouth. But the way of caſtrating we have already deſcribed; nor indeed is there any other method obſerved in caſtrating lambs, than in caſtrating a larger quadruped.

of the belly, without any evacuation. The nature of this graſs is aſtringent, ſo that it has a double effect upon them, both to ſwell and bind their belly, which is more probable, than to render the words, *convulſes their belly*, which *diſtentio* and *contractio* frequently ſignify.

CHAP.

CHAP. VI.

Of Goat-Cattle.

AND foraſmuch as enough has been ſaid of ſheep-cattle, I ſhall now return to the goat-cattle. But this kind requires and delights in thickets, rather than in a champain ſituation; and finds exceeding good paſture alſo in rough, rugged, and woody places: for it neither diſlikes brambles, nor is hurt with briars; and it delights moſt of all in little trees, and in places where ſhrubs grow. Theſe are the ſtrawberry-tree, the ever-green privet, wild ſhrub-trefoil, as alſo ever-green and common-oak-ſhrubs, which do not leap up to a great height. An he-goat, who has two ſmall warts hanging down from his neck, is reckoned the beſt, of a very large body, with thick legs, a full and ſhort neck, flaccid and ſwagging ears, a ſmall head, black, thick, ſhining, and exceeding long hair; for he himſelf alſo paſſes through the hands of the ſhearers,

'For wretched ſeamens coats, and th' uſe of camps (1).'

But one of ſeven months is fit enough for procreating, becauſe he is immoderate in his luſt; and while he is yet nouriſhed with the dug, he leaps upon his dam; and therefore he grows quickly old, even before he is ſix years complete, becauſe he is exhauſted with a too early deſire of venery, during the very firſt years of his puerility. Therefore, when he is five years old, he is reckoned not very fit for impregnating the female.

A ſhe-goat is chiefly approved, which is the moſt like to the he-goat we have deſcribed, if ſhe has alſo a very great udder, and gives milk in great abundance. In a calm conſtitution of the climate, we will purchaſe this cattle without horns, but in a ſtormy and rainy climate, always that which has horns: for even in every region it is neceſſary, that the huſbands of the flocks ſhould be without horns; becauſe ſuch as are horned are almoſt pernicious, by reaſon of their petulancy, and aptneſs to butt. But it is not expedient to have a greater number of this kind, than one hundred heads in one incloſure, ſeeing a thouſand of the wool-bearing kind may be provided with folds, with equal eaſe and conveniency. And when ſhe-goats are firſt bought, it is better to buy one intire flock, than ſmall parcels out of ſeveral, that while they

(1) *Virg. Georg.* iii. 313.

are feeding, they may not ſeparate and divide into ſeveral diſtinct parcels, and that they may ſtand together quietly and with greater concord in the goat-houſe. Violent heat hurts this cattle, but cold is more hurtful, and eſpecially to ſuch as are great with young; for the froſt deſtroys their conception. Nevertheleſs theſe are not the only things which occaſion abortion, but maſt alſo, when they give them leſs of it than is ſufficient to ſatiate them: therefore, unleſs it can be given them in great abundance, no allowance of it at all ought to be given to the flock.

The principal time for the putting the male to the female is commonly during the autumn, before the month of *December*, that ſo they may bring forth their young when the ſpring approaches, when the thickets are budding, and when the woods begin firſt to put forth their new leaves. But you ought to chuſe ſuch a goat-cote for them, as is all paved with a natural rock, or by hand, becauſe there is no litter laid under this cattle, and a diligent Goatherd ſweeps their cotes every day, and neither ſuffers dung nor moiſture to remain in them, nor mire and dirt to be formed, all which are hurtful to goats: but, if they be a generous race, they bring forth frequently two, ſometimes three at a time. It is a very ſorry increaſe of the flock, when two mothers produce but three kids, which, when they are brought forth, are educated in the ſame manner as lambs, except that the laſciviouſneſs of the kids muſt be checked, and reſtrained within narrower bounds. Alſo, over-and-above plenty of milk, you muſt give them elm-ſeed, or ſhrub-trefoil, or ivy; or you muſt throw tops of the maſtich-tree alſo, and other ſmall leaves, before them. But of twins, one head, which appears to be the ſtrongeſt, is reſerved for recruiting the flock, the other is delivered to the merchants. A kid muſt not be put under a ſhe-goat of one or two years old to be ſuckled and brought up (for both theſe ages bring forth young); for none of them ought to educate, but ſuch as are three years old. But the young offſpring muſt be preſently driven away from her that is but one year old, and have admittance to her that is two years old, till it be fit for ſale. Nor muſt the mothers be kept beyond eight years, becauſe, being wearied with continual births, they become barren.

But the Overſeer of the cattle ought to be lively and active, hardy, ſtout, exceeding patient of labour, briſk, chearful, courageous, and daring, and one who eaſily goes over rocks and deſarts, and thro' briars and thorns; and that he may not, as keepers of cattle of another kind, follow, but for the moſt part go before the flock: wherefore it is neceſſary, that he be exceeding nimble and active. The young goats,

while

while they are browzing in the thickets, give place to the older goats. She that gives place ought to be checked from time to time, that ſhe may not run before, but browze and gather her fodder quietly and ſlowly, that ſhe may both have a large udder, and not be of a very lean and ill-favoured body.

CHAP. VII.

Of Medicines for Goats.

OTHER kinds of cattle, when they are afflicted with a peſtilence, at firſt gradually decay, and fade away with their diſeaſe, and their languiſhing illneſſes. Young goats alone, though they be in good plight of body, and chearful, are ſuddenly cut down, and deſtroy'd in whole flocks, as it were with ſome ſudden deſtruction. This uſes to happen chiefly from great plenty of fodder: wherefore, when the plague has ſtruck one or two of them, they muſt all preſently be let blood: nor muſt they be fed the whole day, but ſhut up within their folds the four middle hours *of the day*. But, if any other languiſhing illneſs infeſts them, they are cured with a potion made of the roots of the reed, and the white thorn, with which, after we have carefully bruiſed them with an iron peſtle, we mix rain-water, and give that alone to the cattle to drink. But, if this thing does not drive away their ſickneſs, the cattle muſt be ſold; or, if this cannot be done, they muſt be killed with the knife, and ſalted. Afterwards, ſome ſpace of time interpoſed, it will be proper to provide again another flock; nevertheleſs, not before the peſtilent time of the year, whether that be in the winter, be removed by the ſummer, or, if it be in the autumn, it be changed by the ſpring. But, when any particular one of them is ſick in the houſe, we ſhall apply the ſame remedies to them, as we did to ſheep alſo. For when their ſkin is diſtended with water, which diſeaſe the *Greeks* call ὑδρωψ, (a dropſy) a ſlight inciſion made in the ſkin under the ſhoulder will let out the pernicious water, then the wound that is made may be cured with liquid pitch. When the genital parts of one that has newly brought forth, are ſwelled, or the after-births have not anſwered, let a *ſextarius* of muſt, boiled into two thirds of the firſt quantity, or, if that be wanting, the ſame quantity of good wine, be poured into their jaws; and let their natural parts be filled with liquid ointment, wherein wax is the chief ingredient. But,

that I may not now treat fully of every particular, we ſhall cure goat-cattle in the ſame manner as has been already directed with reſpect to ſheep.

CHAP. VIII.

Of the Method of making Cheeſe.

THE care of making cheeſe muſt not be omitted, eſpecially in regions that lie at a great diſtance from town, where there is not the conveniency of carrying the milk-pail to market. Moreover, if the cheeſe be made of thin liquor, it muſt be ſold as quickly as poſſible, while it is yet green and retains the juice. If it be made of rich and fat milk, it will bear to be kept longer. But it ought to be made of pure milk, and of the freſheſt, without any mixture: for that which has ſtood long, and is mixed, contracts a ſharpneſs. They commonly curdle it with a lamb's or a kid's runnet, although it may alſo be brought into a conſiſtency, both with the flower of the wild thiſtle, and with the ſeeds of baſtard-ſaffron, or the bleſſed thiſtle; and alſo with fig-tree-milk, which the tree emitteth, if you wound its green bark. But, indeed, that is the beſt cheeſe which has the leaſt of the drug in it. But the weight of a *denarius* of runnet is the leaſt that a pail of milk requires. Nor is there any doubt but cheeſe made of milk congealed with fig-tree-twigs taſtes exceeding ſweet.

But the milk-tub, when it is filled with milk, ought not to be without ſome gentle warmth. Nevertheleſs, it muſt not be brought ſo near as to touch the flames, as ſome people are of opinion, but be placed not far from the fire; and preſently after it is curdled, the liquor muſt be transferred into wicker-baſkets, cheeſe-vats, or moulds; for it is of great importance, that the whey be ſtrained and ſeparated from the condenſed ſubſtance as ſoon as poſſible: for which reaſon, the country-people do not indeed ſuffer the moiſture to drop ſlowly from it of its own accord; but, when the cheeſe becomes a little more ſolid, they put weights upon it, that thereby the whey may be ſqueezed out: then, as it is taken out of the moulds or frails, it is laid up in a dark and cold place, upon the very cleaneſt boards, that it may not be ſpoiled; and it is ſprinkled with bruiſed ſalt, that it may ſweat out the acid liquor: and when it is hardened, it is preſſed more vehemently, that it may be conſpiſſated; and it is ſprinkled again with toaſted

toaſted ſalt, and condenſed again with weights. After this has been done for nine days, it is waſhed throughly with ſweet water, and placed in ſuch a manner under a ſhade, upon hurdles made for that purpoſe, that one cheeſe may not touch another, and that it may be moderately dried. Then, that it may keep the tenderer, they put it cloſe together in ſeveral ſtories, in a cloſe place, not expoſed to the winds. Thus it neither becomes ſpongy and full of holes, nor ſalt, nor dry: the firſt of which faults uſes to happen, if it be preſſed but a little; the ſecond, if it be ſeaſoned with too much ſalt; and the third, if it be ſcorched in the ſun. This kind of cheeſe may be exported alſo beyond ſea. For that which is deſigned to be eaten in a few days, while it is new, is made up with leſs care: for, being taken out of the wicker baſkets, it is put into ſalt and brine, and ſoon afterwards dried a little in the ſun.

Some, before they put the ſhackles upon the cattle, put green pine-apples into the milk-pail, and preſently milk the cattle upon them; and they do not ſeparate them till they have tranſmitted the coagulated ſubſtance into moulds. Some bruiſe the green kernels themſelves, and mix them with the milk, and ſo congeal it. There are ſome who put bruiſed thyme, ſtrained through a ſieve, with the milk when they curdle it. In like manner you may make it of whatever taſte you pleaſe, by adding to it the ſeaſoning you have made choice of. But that way of making what we call hand-preſſed cheeſe, is exceeding well known; for when it is a little congealed, and while it is yet warm in the milk-tub, they cut it; and, having ſprinkled it with boiling water, they either ſhape it by hand, or ſqueeze the whey out of it in box-wood moulds. Alſo that which is hardened in brine, and ſo coloured with the ſmoak of apple-tree wood, or of ſtubble or ſtraw, is not of a diſagreeable taſte (1). But now let us return to the breeding *of cattle*.

(1) Cheeſe dried in the ſmoak was much eſteemed by the *Romans*, and preferred to all other ſorts; and at *Rome* there was a particular place for ſmoking it, which *Pliny* ſays made it very agreeable to the taſte, *lib.* xi. 42. Our author recommends the ſmoak of apple-tree-wood or ſtubble for that purpoſe.

CHAP.

CHAP. IX.

Of Swine, and of Medicines proper for them.

IN all kinds of four-footed beaſts, the ſhape and form of the male is choſen with great care, becauſe the progeny is frequently more like the father than the mother: wherefore, in ſwine-cattle alſo, certain of them muſt be approved, which are choice and ſingular for the largeneſs of their whole body, and ſuch as are rather ſquare, than thoſe that are long or round, with an hanging-down belly, vaſt buttocks, but not ſo long legs and hoofs, of a large and glandulous neck, with ſhort ſnouts, and turned upwards; and eſpecially, which is more to the purpoſe, the males muſt be exceeding ſalacious, and ſuch as are proper for gendering from the age of one year, till they come to their fourth year: nevertheleſs they can alſo impregnate the female when they are ſix months old. Sows of the longeſt ſize and make are approved, provided they be, in the reſt of their members, like the boars, which have been already deſcribed.

If the country is cold, and liable to hoar-froſts, the herd muſt be choſen of an exceeding hard, thick and black briſtle. If the country be temperate, and lie expoſed to the ſun, the cattle that is ſmooth, and has no briſtles, or even that which is white, and proper for the mill, and the bakehouſe, may be fed. The female is reckoned fit for pigging till ſhe be almoſt ſeven years old; and by how much the more fruitful ſhe is, by ſo much the ſooner does ſhe grow old. One of a year old is not altogether unfit for conceiving; but ſhe ought to be put to the boar in the month of *February*, that ſo, being four months with young, ſhe may farrow in the fifth, at a time when the herbs are more ſolid and ſubſtantial, that ſo the pigs may both have milk in its greateſt ſtrength and perfection, and that, when they leave off receiving nouriſhment from the udder, they may be fed with ſtubble, and with ſuch leguminous fruits as fall to the ground of their own accord. This is what is practiſed in regions very remote from cities, where nothing turns to account but the bringing them up for breed; for, in regions contiguous to the city, a ſucking pig muſt be exchanged for money; for ſo the mother, by not bringing-up her young, is freed from labour, and will more quickly conceive, and bring forth again; and that ſhe will do twice a year.

The males are caſtrated, that they may grow fat, either after their firſt coition, when they are ſix months old, or after they have often

gendered, when they are three or four years old. They alſo exulcerate the wombs of the females with an iron inſtrument, and ſhut them up with the cicatrices, that they may not breed. What reaſon ſhould induce people to this, I do not underſtand, except it be ſcarcity of food; for, where there is great plenty of fodder, it is always expedient to put them upon breeding, to raiſe a new offspring.

This cattle will make a ſhift in any grounds whatſoever, whatever their ſituation may be; for they are fed very commodiouſly both upon mountains and in plains; better nevertheleſs in marſhy, than in thirſty lands. Woods are moſt proper for them, which are cloathed with the common oak, the cork-tree, the beech-tree, the tall *cerrus* (1), and ever-green oaks, wild-olive trees, tamariſk (2), hazel, and wild pomiferous trees, ſuch as the white hawthorns, *Greek* carob-trees, the juniper, the lote or nettle-tree, the pine, the cornel-tree, the ſtrawberry-tree, the plum-tree, and Chriſt's thorn, and choak-pear-trees; for theſe grow mellow, and ripen at different times, and ſatiate the herd almoſt the whole year. But, where there is a ſcarcity of trees, we will endeavour to get for them food that grows immediately upon the ground, and prefer dirty and miry paſture to that which is dry, that they may ſearch all the marſhes and bogs, and dig out the worms, and wallow in the mire, which is mighty agreeable to this cattle; as alſo that they may be at liberty to ſpoil and waſte the waters; for it is alſo of great benefit to them to do this, eſpecially during the ſummer, and to grub up the ſmall roots of the aquatile wood, as of the ruſh, the flag, and the low baſtard reed, which the vulgar calls *canna*. For, indeed, land that is cultivated makes ſwine fat, when it is graſſy, and planted with very many ſorts of pomiferous trees, that throughout the different ſeaſons of the year it may yield apples, plums, pears, nuts of many different forms, and figs. Nevertheleſs, we muſt not, becauſe of theſe, be ſparing of our barns: for, when forage fails without doors, we muſt give it them by hand. For which purpoſe, a great

(1) *Cerrus*. This kind of oak, as has been already ſaid, according to the account that *Pliny* gives of it, *Nat. Hiſt. lib.* xvi. 5. was in his days ſcarcely known in moſt parts of *Italy*. It is a very tall tree, with an acorn unpleaſant and diſagreeable to the eye, rough and unpleaſant to the hand, when it is handled, with an echinated calyx, or a cup beſet with prickles like an hedge-hog, and much longer than that of other oaks.

(2) *Tamaricibus*. Some think that this is not the true reading, becauſe the fruit of this tree is exceeding ſmall, and covered with a down, and cannot be good for ſwine. *Pliny* ſays, that it is only fit for brooms, and denies that it has any fruit, *Nat. Hiſt. lib.* xvi. 26. *Pontedera* thinks, that the true reading is *termitibus*, which ought to be joined with the preceding word *oleaſtris*, ſo that it may ſignify, boughs of the olive-tree with fruit upon them. But as other authors ſay, that it bears fruit, and *Matthiolus* makes it the ſame with the *Myrica*, probably *Pliny* meant a certain wild ſort in ſome parts of *Italy*.

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quantity of maſt muſt be laid up in water-ciſterns (3), or in the ſmoak in lofts: they muſt alſo have an allowance of beans, and ſuch-like legumes, when their low price permits it; and eſpecially in the ſpring, while green things are as yet in the milk, which for the moſt part is hurtful to ſwine: therefore in the morning, before they go forth to the paſtures, they muſt be ſuſtained with ſuch food as has been laid up in ſtore for them, leſt the herbs, which are not come to maturity, give them a looſeneſs, and the cattle be emaciated with that diſtemper; nor ought they to be all ſhut up cloſe together, as our other flocks; but the ſwine-ſties muſt be made after the manner of porticoes, wherein they may be ſhut up, either after they have farrowed, or when they are pregnant alſo: for ſwine eſpecially, when they are ſhut up, and confuſedly huddled in whole herds together, lie one upon another, and make one another caſt their young, or overlay and ſmother them. Wherefore, as I ſaid, ſwine-ſties muſt be built joining to walls, to the height of four feet, that the ſow may not be able to leap over the incloſures; for ſhe ought not to be covered over, that ſo the Keeper may from the upper part count the number of the pigs; and if the mother be lying upon any of them, and ſmothering them, pull it from under her.

But let the Keeper be vigilant, active, induſtrious, knowing, and ſkilful: and he ought exactly to remember all the ſwine which he feeds, both ſuch as are kept for breed, and have pigs actually under their care, and alſo thoſe that are younger, that he may conſider and take care of every one of their litters in particular: and let him always obſerve her that is near the time of her farrowing, and ſhut her up, that ſhe may bring forth her young in the ſwine-ſtie; then let him mark down preſently how many, and what kind the young ones are of; and eſpecially take care, that none of them be brought up by a ſtrange nurſe: for pigs, if they eſcape out of the hog-ſtie, very eaſily mix themſelves with others; and the ſow, when ſhe has laid herſelf down, gives her dugs equally to a ſtranger and to her own. Therefore the chief buſineſs of a ſwineherd is to ſhut up every one of them with her own offspring, who, if his memory fails him, ſo that he cannot know every ſow's progeny in particular, may, with liquid pitch, put the ſame mark upon the ſow and her pigs, and either by letters,

(3) *Ciſternis in aquam.* It is very probable, that this ſentence is corrupt, for it cannot be ſuppoſed, that maſt can be kept long in water without ſpoiling; ſo that *Pontedera*'s correction ſeems very probable, *ciſternis ſine aqua, vel fumoſis tabulatis*; in ciſterns without water, or in ſmoaky lofts: or perhaps the author directs, that they be laid up in order to throw them into the ciſterns, when they go to drink, that they may then eat them, after they have been ſoftened in the water.

or by ſome other marks, diſtinguiſh the dam and every one of her young. For, in a greater number, it is neceſſary to have different marks, that the Keeper's memory may not be confounded. Nevertheleſs, becauſe it ſeems troubleſome and difficult to do this in large herds; it is moſt convenient ſo to build the ſwine-ſties, that their threſholds may riſe to ſuch an height, as the nurſe may juſt be able to get out of it, but the ſuckling not be able to ſtep over it; ſo a ſtranger does not creep in; and every litter, which, nevertheleſs, ought not to exceed the number of eight heads, waits for its own mother in her bed-chamber. Not that I am ignorant, that the fecundity of breeding ſows is productive of a greater number; but becauſe ſhe that brings up more, loſes her ſtrength, and very quickly decays. And thoſe which ſuckle and bring up their own young, muſt be ſuſtained with boiled barley, leſt they be reduced to extreme leanneſs, and from that to ſome deſtructive diſtemper. But let a diligent Swineherd frequently ſweep the hog-houſe, and oftener the ſwine-ſties: for tho' the foreſaid beaſt is very naſty and dirty in its way of feeding, nevertheleſs it loves to have a very clean bed to lie in. This is commonly the way of managing of ſwine-cattle, that enjoy a good ſtate of health.

CHAP. X.

Of Medicines proper for Swine.

OUR next buſineſs is to tell, what care is to be taken of that which is diſeaſed. The ſigns of ſwines being in a fever, are, when they hang down their heads, and carry them awry; and, after they have run a little up and down the paſtures, they ſuddenly ſtand ſtill, and, being ſeized with a giddineſs, fall down. We muſt take particular notice, to what ſide their heads incline, that we may let them blood in the ear on the contrary ſide. Let us alſo ſtrike a vein under their tail, at the diſtance of two inches from their buttocks, which is large enough in that place; and it muſt be firſt beaten with the ſprig of a vine; then, when it is ſwelled with the ſtroke of a rod, be opened with a lancet; and, after they have been blooded, the vein muſt be bound up with the rind of the willow-tree, or of the elm-tree alſo. When we have done this, we muſt keep the cattle one or two days in the houſe, and give them moderately warm water, as

much as they ſhall deſire; and to each of them a ſextarius of barley-meal.

Such of them as have ſwellings in the glands under the throat, muſt be let blood under the tongue; and, when it has flowed abundantly, it will be proper, that their whole mouth he rubbed over with bruiſed ſalt and wheat-meal. Some think it a more preſent and effectual remedy, when they pour into each of them, through an horn, three cup-fulls of *garum* or ſalt fiſh-pickle; then they bind cloven tallies or cuttings of fennel-giant with a ſmall flaxen cord, and hang them ſo at their necks, that the ſwellings may be touched with the fennel-giant cuttings. Ivory ſaw-duſt, or filings of ivory, alſo, mixed with parched ſalt, and beans bruiſed very ſmall, thrown before them when they are hungry, before they go forth to their paſtures, is reckoned very ſalutary to ſuch of them as nauſeate their food. Alſo the whole herd uſes to be ſo ſick, that it is emaciated, and takes no food; and when they are led forth to the paſtures, they lie down in the middle of the field, and, being ſeized with a certain lethargy, they give themſelves wholly up to ſleep in the heat of the ſummer-ſun; which when they do, they ſhut up the whole herd in a covered hog-houſe, and keep them from drinking and forrage for one day: the day after, they give them, while they are thirſty, the root of the ſerpentine cucumber bruiſed and mixed with water; which when the cattle have drunk, they are taken with a nauſeating, and both vomit and purge; and, when all the bile is driven out, they allow them chichlings or beans ſprinkled with very ſtrong brine, and then they give them (as they do to men) warm water to drink.

But, as thirſt, during the ſummer, is hurtful to all four-footed beaſts whatſoever, ſo, moſt of all, is it pernicious to ſwine. Wherefore we do not command, that, as the goat and the ſheep, ſo this animal alſo ſhould be led twice to water: but that, if it can be done, it be conſtantly kept hard by a river, lake, or pond, during the riſing of the Dog-ſtar; becauſe, as it is an exceeding hot beaſt, it is not contented with drinking the water, unleſs it plunges its naſty fat flanks, and belly diſtended with fodder, into it, and cools them therein: nor does it delight more in any thing, than to wallow in brooks, and in a miry lake or bog. But, if the ſituation of the place does not allow this to be done, you muſt draw water out of wells, and put it into troughs in large quantities, and give it them to drink plentifully; with which if they be not abundantly ſatiated, they become diſeaſed in their lungs. And this diſeaſe is exceedingly well cured, by inſerting *lungwort* into the flaps of their ears; concerning which little root we have

have carefully and very often ſpoken already. Alſo the pain of a diſtempered ſpleen uſes to plague them, which happens, when there chances to be a great drought; and, as the Bucolic poem ſpeaks,

'When on all ſides the apples ſcatter'd lie
'Each under its own tree (1).'

For it is an inſatiable cattle, and the ſwine, while, beyond all meaſure, they eagerly ſeek after fodder that is ſweet, labour and are affected in the ſummer with a ſwelling or growth of the ſpleen; from which they are relieved, if troughs be made of tamariſks and butchers broom, and filled with water, and ſet before them when they are thirſty: for the medicinal juice of the wood, being ſwallowed with their drink, puts a ſtop to the inteſtine ſwelling (2).

CHAP. XI.

Of Caſtrating of Swine.

THERE are two times obſerved for caſtrating this kind of cattle, the ſpring and autumn: and there are two different ways of performing it. The firſt is that which we have already given an account of; when, after two wounds or inciſions are made, the teſticles are ſqueezed out one by one, through each of the wounds: the other is more ſpecious, but more dangerous; which, nevertheleſs, I ſhall not omit. After you have cut with a knife, and pulled out one of the virile parts, thruſt in a penknife through the wound which you have made, and cut the middle ſkin as it were, which intervenes between the two genital members, and with your crooked fingers pull out the other teſticle alſo: thus, having applied the other remedies, which we taught you before, there will be but one cicatrice.

But there is one thing which I thought ought not to be concealed, which concerns the religion of a Maſter of a family, and which may raiſe ſcruples, and ſuperſtitious fancies, in his mind. There are ſome ſows,

(1) *Virgil. Eclog.* vii.

(2) The only difficulty here is, how troughs can be made of *ruſcus*, butchers broom. Some think, that the true reading is *tamaricis e trunco*. *Pliny*, *lib.* xxiv. 9. ſpeaks of canals or troughs made of the *tamarix*. Authors are not ſo very exact in every ſentence, as to be confined always to the very letter; perhaps *Columella* meant no more, than that the inſide of their troughs ſhould be well lined with the branches of theſe trees.

which eat their own young, which, when it happens, is not looked upon as a prodigy; for, of all cattle whatſoever, ſwine are the moſt impatient of hunger; ſo that, ſometimes, if they want food, they devour, not only the offspring of other creatures, (if they have liberty) but their own alſo. I have diſcourſed accurately enough (if I am not miſtaken) of Herds of big Cattle, of the other ſorts of Cattle, and of Shepherds and Herdſmen, by whom flocks and herds of four-footed beaſts are taken care of, tended, and looked after, both in the houſe and without doors, ſo far as human prudence and induſtry are requiſite.

CHAP. XII.

Of Dogs.

I Shall now, as I promiſed in the preceding book, ſpeak of dumb keepers, or watches, tho' a dog is falſly called a dumb keeper: for what man living can publiſh or proclaim more diſtinctly, and with ſo great vociferation, the approach of a beaſt, or a thief, as he can do with his barking? What ſervant is there, that loves his maſter more? What companion more faithful? What keeper or watchman leſs liable to bribes and corruption? What watchman can be found more vigilant? In a word, Who will be more ſteady in avenging your injuries, or in protecting you from them? Wherefore an Huſbandman ought to purchaſe and maintain this animal, even among the very firſt things, becauſe he keeps and guards both the manor-houſe, and the fruits, and the family, and the cattle.

But there are three different purpoſes to which regard is had in purchaſing and maintaining this animal: for one kind is choſen *to protect us* againſt the ſnares and inſidiouſneſs of men, and this keeps and guards the manor-houſe, and ſuch things as are adjoining to it. But a ſecond kind is choſen for repelling the injuries of men, and wild beaſts; and this kind watches over the ſtables and folds at home, and the cattle when they are feeding abroad. A third kind is provided for hunting withal; and this not only gives no aſſiſtance to the Huſbandman, but it takes him off his buſineſs, and makes him lazy and ſlothful: therefore we muſt ſpeak of the houſe-dog, and of that of the Shepherd; for the hunting-dog does not at all belong to our profeſſion.

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The keeper of the manor-houſe muſt be choſen of a very large body, and of a vaſt canorous bark, that the evil-doer may be firſt terrified when he hears him, and afterwards alſo when he ſees him; and even ſometimes when he is not ſeen, may notwithſtanding, with his hideous roaring and growling, put to flight him that lies in wait to do you hurt. But let him be of one colour, and let that rather be choſen white in a Shepherd's dog, and black in one for the manor-houſe; for a various colour is commendable in neither. A Shepherd approves of the white, becauſe he is unlike to the wild beaſts; and ſometimes there is great occaſion for ſome remarkable difference to diſtinguiſh them, when he is driving away the wolves, either in a dark morning, or in the twilight in the evening alſo, leſt, inſtead of the wolf, he ſtrike the dog, if he is not very conſpicuous by his white colour.

The manor-houſe dog, which is placed there in order to oppoſe the miſchievous deeds of wicked men, whether the thief comes when it is fair daylight, appears more terrible when he is black; or whether he comes in the night, the dog is not ſo much as ſeen, becauſe of the reſemblance he bears to darkneſs; wherefore being covered with the darkneſs, he has ſafer acceſs to him who lies in wait to hurt you. One that is ſquare is more eſteemed than one that is long or ſhort, with ſo huge an head, that it may ſeem to be the greateſt part of his body, with dejected and propendent ears, black or fiery red-coloured eyes radiant with ſparkling dazling light, a large and hairy breaſt or cheſt, broad ſhoulders, thick and rough briſtly legs, a ſhort tail, exceeding large toes and nails, which in *Greek* are called δράκαι (1). This ſhall be the form, and ſize, and make of the manor-houſe dog, moſt to be commended; but his manners or natural temper ought neither to be exceeding gentle and mild, nor, on the contrary, cruel and fierce; becauſe with the firſt he fawns upon a thief alſo, and with the laſt he falls upon the domeſtics. It is enough, that they be ſevere, and not fawning; and that they ſometimes look upon their fellow-ſervants with ſomewhat of a more angry and ſurly countenance, and be always in a fume and rage againſt ſtrangers. But eſpecially, when they are upon guard, they ought never to be ſeen ſleeping, but always upon the watch; not wandering up and down, but aſſiduous and circumſpect, rather than raſh and inconſiderate: for thoſe never give the alarm, or warning of any thing, but what they are very ſure of; theſe are rouſed up with any vain noiſe, and groundleſs ſuſpicion.

(1) Δράκαι, in ſome editions δράκες, which ſignifies, handfuls of any thing. *Heſychius* ſays, that the word ſignifies the *palm of the hand*: when applied to dogs, no doubt, it ſignifies their toes and nails.

I thought

I thought that theſe things were therefore proper to be mentioned, becauſe not nature only, but diſcipline alſo, forms the manners and temper, that ſo, when we have occaſion to buy them, we may make choice of ſuch as have theſe qualities; and, when we educate ſuch as are whelped at home, we may form them with ſuch inſtitutions as theſe. Nor is it of any great importance, whether manor-houſe dogs be of heavy bodies, and not very ſwift, or no; for they ought to do more upon the place where they are poſted, and in the paſſage and entry to the houſe, than in ſallying out to the open ground, and at a diſtance from their ſtation: for they ought always to remain about the incloſures, and within the edifice, yea never ſo much as to retire to any great diſtance from it; and they do their duty well enough, if they both ſagaciouſly ſmell any one coming toward them, and terrify him with their barking, and do not ſuffer him to come nearer, or violently fall upon him that perſiſts to approach. For the firſt thing is, *not to be attacked*; and the ſecond thing is, when provoked and ſet upon, *to defend and avenge himſelf* with courage and perſeverance. And what has been ſaid, relates to domeſtic guards; what follows, to paſtoral.

A dog for keeping cattle ought neither to be in ſo bad a plight of body, nor ſo ſwift, as one that purſues fallow-deer and ſtags, and the ſwifteſt animals; nor ſo fat and heavy, as the guard and keeper of the manor-houſe and the barn: but, nevertheleſs, he ought to be robuſt, and to a certain degree prompt and bold, becauſe he is prepared and appointed for quarrelling and fighting, no leſs than for running, ſeeing he ought to repel and oppoſe the ſnares of the wolf, and purſue the ſavage and cruel robber when he flies, and ſhake the prey out of his jaws, and reſcue it, and take it away from him. Wherefore a longer and more produced or out-ſtretched ſtate or make of body is more fit and ſuitable for theſe adventures, than the ſhort, or even than that which is ſquare; becauſe (as I ſaid) neceſſity ſometimes requires, that a beaſt ſhould be purſued with great celerity: the reſt of his joints, being like the members of the houſe-dog, are equally approved.

Almoſt the ſame food muſt be given to both kinds: for, if your lands are ſo wide and ſpacious, as to ſuſtain flocks and herds of cattle, barley-meal with whey is excellent food for all dogs whatſoever, without any diſtinction. But if your land is planted with trees, and without paſture, they muſt be ſatiated with bread made of red or bearded or common wheat: nevertheleſs, you muſt mix the liquor of boiled beans

beans with it: but it muſt be lukewarm; for, when it is boiling hot, it creates madneſs.

To this quadruped, whether male or female, venery muſt not be permitted, till after it is a year old; for, if it is allowed, it conſumes both their body and their ſtrength, and makes their minds to degenerate. The firſt birth of one that has brought forth muſt be taken away from her; for, being a young novice, without any experience, ſhe cannot nurſe them rightly: and her educating them ſpoils the growth of her whole habit. The males procreate in a youthful manner till they are ten years old; after that age they ſeem unfit for coupling with the female, becauſe the offspring of ſuch as are older proves dull and unactive. The females conceive till they are nine years old; nor are they uſeful after their tenth year. The whelps muſt not be let out during their firſt ſix months, till they are grown ſtrong, except it be to their dam, in order to play and wanton: afterwards they muſt be kept in chains in the day-time, and looſed during the night. Nor will we ever ſuffer thoſe, whoſe generous diſpoſitions we have a mind to preſerve, to be educated at the dugs of a ſtrange nurſe; becauſe both the maternal milk and ſpirits do always much more improve the growth of their genius, and of their body. But, if ſhe that has brought forth is deficient in milk, goats milk will be proper to be given to the puppies, till they be four months old.

Alſo they muſt be called by names that are not very long, that every one of them may hear the more ſpeedily when he is called: nevertheleſs not with ſhorter names, than what may be pronounced with two ſyllables; as the *Greek* name σκύλαξ, (puppy) the *Latin ferox*, (ſurly) the *Greek* λάκων, (*lacon*) the *Latin celer* (nimble, or ſwift-foot); or for the female, as the *Greek* names σπουδὴ, (ſpeedful) ἄλκη, (courage) ῥώμη, (proweſs) and the *Latin lupa*, (harlot) *cerva*, (deer-like) *tigris* (tygreſs). It will be proper to curtail the puppies, the fortieth day after they are whelped, in this manner: there is a nerve, which creeps all along through the joints of the back-bone, as far as the extremity of the tail; they take faſt hold of this with their teeth; and, after they have drawn it out a little, they bite or break it off; which being done, the tail does not grow out into an abominable length; and (as very many Shepherds affirm) madneſs, a diſeaſe mortal to this kind, is thereby prevented (2).

CHAP.

(2) This laſt paragraph, relating to the curtailing of whelps, is quoted by *Pliny*, *lib.* viii. *c.* 41. and commended in order to prevent their running mad, which, he ſays, is fatal to them during the dog-days; and ſays, that, in order to prevent it, they uſed at that time

CHAP. XIII.

Of Diſeaſes incident to Dogs, and of the Way of curing them.

BUT commonly, during the ſummer, the ears of dogs are ſo exulcerated by flies, that they oft-times loſe them intirely: to prevent which, they muſt be anointed with bitter nuts bruiſed. But, if they are already affected with ulcers, it will be proper to drop into the wounds liquid pitch boiled with hogs-lard. The tykes fall off them, when they are touched with this ſame medicine; for they muſt not be pulled off with the hand, leſt, as I ſaid before, they make ulcers.

The remedies for a dog plagued with fleas are, either cumin bruiſed in equal quantity with white hellebore, and mixed with water, and rubbed upon them; or the juice of the ſerpentine cucumber (1); or, if you have not theſe, old lees of oyl, ſprinkled over their whole body. If the ſcab infeſt them, bruiſe the ſame quantity of *cytiſus*,

time to mix the dung of a cock, or an hen, with their food; but, if the diſeaſe prevented them, they uſed to mix white ellebore with it: But this diſeaſe is not only fatal to the dogs themſelves, but to men alſo, if they be bitten by them; for, as *Cornelius Celſus* ſays, *lib.* v. *c.* 1. from this wound, if timely aſſiſtance is not given to prevent the bad effects of it, there ariſes what the *Greeks* call an *hydrophobia*, or fear of water, a moſt terrible diſeaſe, whereby the ſick perſon is both tormented with thirſt, and with dread of water at the ſame times. There is, ſays he, very little hope of the recovery of a perſon thus afflicted; but yet there is one only remedy, which is, to throw the perſon all of a ſudden into a pond, without his apprehending or foreſeeing it before it is done. *Pliny* ſays, that there was lately found out a remedy by a certain oracle, *viz.* the root of the wild roſe-buſh, which they called *cynoſrhodos*.

It would be needleſs to give many inſtances of the ſagacity and faithfulneſs of dogs, of their courage in defending their maſters, and of their ſorrow at their death; of which *Pliny*, in his *nat. hiſt. lib.* viii. *c.* 40. gives ſeveral inſtances.

(1) *Cucumis anguineus:* Probably it is ſo called from its figure, reſembling the winding of a ſerpent; accordingly by ſome authors it is called *cucumis flexuoſus*. *Pliny* ſays, that ſome thought it was the ſame with that which is called *cucumis ſilveſtris*, of which they made a medicine, which they called *elaterium*, by expreſſing the juice out of its ſeed: And *Cornelius Celſus*, *lib.* v. *cap.* 12. ſays, that the juice of the ſeed of the wild cucumber was ſo called, becauſe of its ſtrong purgative quality, ἀπὸ τοῦ ἐλᾶν, *pellere*, *quaſi depulſorium*. And *Galen*, in *explicat. vocum Hippocrat.* ſays, that not only this juice, but every thing that purged the belly downward, was ſo called. And *Heſychius* ſays, that the word ſignifies a *cathartic medicine*; ſo that it ſeems very ſtrange, that the plant itſelf ſhould be called by this name; or that it ſhould be thought to be ſo called from the elaſtic force of the ſeed leaping out of it, as ſome authors have ſaid.

or

or ſhrub-trefoil, and *ſeſamum*, or oily-grain together; and mix them throughly with liquid pitch, and anoint the part affected: which medicine is reckoned proper alſo for men. This ſame peſt, if it be more violent, is removed with the liquor that diſtils from the cedar-tree. Their other diſeaſes muſt be cured in the ſame manner as we directed with reſpect to other animals. Thus far of leſſer cattle. We ſhall preſently, in the following book, give directions concerning manor-houſe paſturings, which comprehend the care and management of fowls, fiſhes, and wild four-footed beaſts.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK EIGHTH.

CHAP. I.

Of Paſturings in and about the Manor-houſe (1).

WE have in ſeven books, *Publius Silvinus*, given an account of thoſe things which almoſt conſummate the ſcience of Tilling and Cultivating the ground; as alſo of ſuch things as the conſideration of the buſineſs of managing cattle required. Now this book ſhall bear the title of the following number: not becauſe thoſe things, which we intend to ſpeak of, require the immediate and peculiar care of the Huſbandman; but becauſe they ought not to be undertaken

(1) The *Romans*, who for many ages lived after a very plain manner, and contented themſelves with what their own country produced, without any great art, applying themſelves more to the plain culture of the ground, than to any nice improvements in Husbandry; after they became acquainted with *Greece* and *Africa*, improved their Agriculture to a great degree; and their men of learning and curioſity collected all the knowledge they could have both from *Greek* and *Carthaginian* authors, which were very numerous, and alſo from their own obſervation; ſo that in a little while the art of Huſbandry was carried to as great, if not greater, perfection in *Italy*, than in *Greece* and *Africa*: and they not only adopted the uſeful improvements of *Greece*, but ſoon fell into their delicacy and luxury; which was in nothing more remarkable than in their fiſh-ponds, which they carried to extravagant expences: and of ſuch things as they derived from the *Greeks*, they frequently retained their *Greek* names, as we ſee in this author; who in this, and the laſt chapter of the VIIth book, has more *Greek* words, than in his whole work beſide; which probably he did, tacitly to expoſe and cenſure a piece of vanity, which was more common in our author's days, when luxury was come to its greateſt height, of giving foreign names to a great many of their delicacies. And as this chapter could not be ſo well tranſlated, without leaving the *Greek* words in the text, as our author has done; if any want to know the true ſignification of them, they may find it, by caſting their eye on the place referred to by the number placed after the word.

and

and carried on in any other place but in the country, or in manor-houſes; and they turn to more advantage to thoſe that live in the country, than to thoſe that live in cities. For it is no very ſmall peny that feeding of ſmaller animals within the precincts of the manor-houſe brings in to the Huſbandman, as well as feeding of cattle, ſince with the dung of fowls they both cure the leaneſt vineyards, and all ſorts of young trees, and of land whatſoever: and with the fowls themſelves they make plentiful proviſion for their kitchen, and furniſh their table with valuable and excellent diſhes: laſtly, with the price of the animals that are ſold, they increaſe the yearly income of the manor-houſe. Wherefore I thought it proper to ſpeak of this kind of paſturing alſo; and it is commonly carried on either in, or near to, and about, the manor-houſe.

In the manor-houſe there is what the *Greeks* call ὀρνιθῶνας (2), and περιστερεῶνας (3); and, where there is conveniency of water at command, ἰχθυοτροφεῖα (4), alſo, are carried on and managed with ſedulity and care. But, that we may rather ſpeak *Engliſh*, all theſe are the very ſame as cells, and rooſting-places for common poultry-yard-fowls; and likewiſe as receptacles of ſuch fowls as are ſhut up in coops, and fattened, and of aquatile animals. Moreover, about the manor-houſe are placed μελισσῶνες (5), and χηνοτροφεῖα (6), yea λαγοτροφεῖα (7) alſo, are managed and tended with great care and attention. Which bee-ſtalls, or lodgings for bees, we in like manner call *apiaries*; and the harbouring places for ſwimming fowls, which delight in lakes, and pools, and fiſh-ponds, we call *aviaries*; and thoſe alſo of wild cattle, which are kept confined in incloſed woods and foreſts, we call *vivaries*.

(2) Ὀρνιθῶνας, *acc. plur.* aviaries, or poultry houſes. *Varro, lib.* iii. *c.* 3. by this word meant *receptacles of all manner of birds or fowls fed within the walls of the villa.*

(3) Περιστερεῶνας, *acc. plur.* περιστερεῶν, the ſame as περιστεροτροφεῖον, a dove-houſe or pigeon-houſe, for breeding and feeding doves and pigeons.

(4) Ἰχθυοτροφεῖον, a fiſh-pond, ἰχθὺς, a fiſh, and τρέφω, to feed or nouriſh; a lake, pool, or pond, incloſed in ſuch a manner as the fiſhes cannot eſcape.

(5) Μελισσῶν, a bee-hive or bee ſtall, where bees were kept. *Varro* alſo makes uſe of this word; and it ſeems the word *apiarium* was not much in uſe: μέλισσα, a bee.

(6) Χηνοτροφεῖον, a gooſe-pen, or place where geeſe are fed: χὴν, a gooſe, and τρέφω, to feed.

(7) Λαγοτροφεῖον, *leporarium*, a hare-warren: λαγὸς or λαγωὸς, an hare. *Varro* ſays, that he would have this word taken in a larger ſenſe than what the antient *Romans* meant by it, who kept nothing but hares in them; but he would have it to ſignify all incloſures contiguous to the villa, where wild animals are ſhut up and fed.

CHAP. II.

Of the ſeveral Kinds of common Poultry-yard Hens and Cocks proper to be provided and brought up.

THerefore I ſhall firſt give directions concerning thoſe that are fed within the precincts of the manor-houſe: and, indeed, with reſpect to others, it is perhaps doubted whether country-people ought to have them in their poſſeſſion. But, for the moſt part, it is a common and uſual thing for an Huſbandman to bring up hens: and they are either of the common poultry kind, which they keep in farm-houſes; or what they call ruſtic hens; or of that kind they call *African* hens. The common poultry-yard or farm-houſe hen, is a fowl which is commonly ſeen in all manor-houſes whatſoever: the *ruſtic hen*, which is not unlike to that which is common in all farm-houſes, is deceived and caught by the fowler; and there are great numbers of this kind in an iſland ſituate in the *Ligurian* ſea, which mariners, by lengthening the *Latin* name of the fowl, have called *Gallinaria* (1): the *African* hen, which moſt people call the *Numidian*, is like to the *Meleagris* (2), except that ſhe bears upon her head a bright-red helmet and creſt, both which are blue in the *Meleagris* hen.

But,

(1) *Gallinaria*. *Varro* ſays, that this iſland is in the *Tuſcan* ſea, near the coaſt of *Italy*, over-againſt the *Ligurian* mountains *Intemilium* and *Album Gaunum*. Some authors ſay, it is rather a rock than an iſland. *Columella* ſays, that theſe ruſtic hens were, in their face, not very unlike the common farm-houſe hens. And *Varro* ſays, that at *Rome* they were rare, and ſeldom ſeen tame without a cage; that in their face they were not like the common poultry hens, but like the *African* hens, of a fair and beautiful aſpect; and that commonly they did not breed in the houſe, but in woods. It is not eaſy to determine by what name theſe ruſtic hens are now called: perhaps they might be the breed of the common poultry-yard hens carried by mariners to that iſland, where, being left, they turned wild, as *Varro* ſeems to inſinuate; tho' the ſentence is ſomewhat obſcure, and imperfect.

(2) *Meleagrides*. *Varro*, *lib.* iii. *c.* 9. ſpeaking of *African* hens, which, according to our author, were alſo called *Numidian*, ſays, that they were large, various or ſpotted, and crook-back'd; and that the *Greeks* called them *Meleagridas*. But *Columella* ſays expreſsly, that they were different fowls; that the *African* hen was like the *Meleagris*, except that ſhe carried upon her head a bright-red helmet and creſt, which, in the *Meleagris*, were both blue. It is ſtrange, that *Varro* and *Columella* ſhould differ ſo much in their deſcription of theſe two fowls; but either *Varro* was miſtaken, or the ſentence is imperfect, or not rightly pointed. Some authors ſay, that the *Gallinæ Africanæ* or *Numidicæ* are what we call *Guiney hens*; and that the *Meleagrides* are what we call *Turkey hens*. But the great difficulty is, that the deſcription given by *Athenæus* of the *Meleagrides*, does not at all agree to the *Turkey* hen, which, ſome ſay, was not known to the antients; and that

But, of theſe three kinds the common poultry-yard females are properly called *hens*; but the males are called *cocks*, and the half-males *capons*, which have this name given them when they are caſtrated, in order to deſtroy their luſt. Nevertheleſs, they do not ſuffer this by loſing their genitals, but by having their ſpurs burnt with a red-hot iron; which, when they are conſumed with the force of the fire, are daubed over with potters-clay, till the ſores that have been made are healed up. Therefore the gain, ariſing from this farm or manor-houſe kind, is not deſpicable, if there be a due application of ſkill and knowledge in bringing them up; which moſt of the *Greeks*, and eſpecially the *Delians*, were very famous for, and made great account of. But they, becauſe they ſought for tall bodies, and minds obſtinate in battle, and of invincible courage, did chiefly approve the *Tanagrian* (3) and *Rhodian* kind; as alſo the *Chalcidian* and *Median*, which, by the ignorant vulgar, is called *Melian*. Our own *Italian* kind pleaſes us moſt of any: nevertheleſs, we have no regard to that darling inclination of the *Greeks*, who prepared all the fierceſt fowls they could find, for fighting at their public games. For we give our opinion, and declare what we think proper for eſtabliſhing a revenue, or yearly income, for an induſtrious maſter of a family, and not for a cock-maſter, or a keeper of quarrelſome birds, whoſe whole patrimony for the moſt part, which he had laid at ſtake, and hazarded, the conquering cock-champion has carried away.

Therefore he who ſhall have a mind to follow our directions, muſt conſider firſt of all how many, and what kind, of breeding hens he ought to provide: ſecondly, he ought to conſider, after what manner he ought to manage and feed them; then, at what times of the year he ought to receive their eggs; and, afterwards, to make them ſit upon them, and hatch them: laſtly, he ought to take great care, that the chickens be rightly brought up. For by theſe cares, and

that it was firſt brought from *America* into *Europe*. It ſeems difficult to determine by what modern name they ought to be called. We are told, that they have their name from *Meleager*, the Son of *Oeneus* King of *Calydonia*, whoſe ſiſters were called *Meleagrides*; and that, being conſumed, and much waſted, with mourning for the death of their brother, the poets feigned, that they were changed into *Guiney* hens, or whatever elſe is ſignified by that word. The fable is in *Ovid*, *Metamorph. lib.* viii. if any have the curioſity to look into it.

(3) *Tanagrici Galli*. *Tanagra* is a city in *Bœotia*, very remarkable for the courage and obſtinacy of its cocks. *Pliny* ſays, that they made their country famous by their courage. *Varro* and ſeveral other authors mention them with great commendation. *Rhodus*, an iſland of the *Leſſer Aſia*, on the coaſt of *Caria*; and *Delos*, in the *Ægean* ſea; and *Chalcis* in *Eubœa*, an iſland upon the coaſt of *Greece*, now called *Negroponte*; were all famous for fighting cocks.

ways

ways of managements, the whole poultry-yard buſineſs, which the *Greeks* call *ornithotrophia*, is tranſacted and carried on. Two hundred heads are a ſufficient number for employing the whole care of one perſon to feed them: provided nevertheleſs, that either a diligent old woman, or a boy, be appointed to keep them, and watch over them when they wander up and down, leſt they be ſnatched away, either by men who lay wait for them, or be taken in the ſnares of inſidious animals.

Moreover, it is not expedient to purchaſe any fowls but the moſt fruitful: and let them be of a very red, or a dark-coloured feather, with black pinions: and, if it can be done, let them be all choſen of this colour, or of that next to it. If otherwiſe, let the white be avoided; which, as they are for the moſt part tender, and not very long-lived, ſo ſuch of them as are fruitful are not eaſily found: and, being alſo very conſpicuous, they are, by reaſon of their remarkable white colour, very frequently ſnatched away by hawks and eagles. Therefore, let ſuch of them as are ſet apart for breeding, be of a right good colour, of a ſtrong body, ſquare, large-breaſted, with great heads, ſtraight, bright-red and ſmall creſts, white ears; and, of this make and appearance, the largeſt that can be found, and not with an even number of claws: they are reckoned the moſt generous which have five toes, but ſo that no croſs-ſpurs appear and ſtick out upon their legs: for ſhe that bears this maſculine badge, is obſtinate and refractory; and diſdains to admit the male; and is ſeldom fruitful: and alſo, when ſhe ſitteth upon her eggs, ſhe breaks them with the ſharp points of her claws.

It is not expedient to keep any cocks for hens, but ſuch as are exceeding ſalacious; and in theſe alſo, the ſame colour as in the females, and the ſame number of claws, but a loftier make and ſtature, is required: lofty creſts, of a bloody colour, and not crooked, or ſtanding awry: yellow-red eyes, or tending ſomewhat to black: ſhort and crooked bills; exceeding great and very white ears: rattles from a bright-red tending to white, which hang down like grey beards: then manes of various colours, or yellow, ſomewhat varying from a gold colour, diffuſed all over their necks to their ſhoulders: then broad and muſculous breaſts, and brawny wings like arms; alſo very long tails, bending with a double row of large feathers ſticking out on each ſide; as alſo vaſt thighs, covered all over with thick briſtly feathers, all ſtanding on end; robuſt legs, but not long, armed, as it were, with miſchievous ſpears, in order to hurt. But their manners and natural temper, tho' they are not prepared and trained up for the

battle, nor for obtaining the prize, nevertheleſs ſuch as are generous are moſt approved; that they be elate, chearful, watchful, and ready to crow often, not ſuch as are eaſily frightened; for ſometimes they ought to reſiſt and protect their conjugal flock; yea, even kill a ſerpent, when he rears his threatening head, or any other noxious animal: for ſuch males as theſe they provide five females each. For of the *Rhodian* and *Median* kind, becauſe of their heavineſs, neither are the fathers very ſalacious, nor the mothers fruitful; nevertheleſs, they match three of them with one huſband. And when they have laid a few eggs, they are ſlothful and backward to ſit upon them, and much more to hatch them; and ſeldom bring up their young ones. Therefore they who love to have theſe kinds in their poſſeſſion, by reaſon of the beautiful make of their bodies, when they have got the eggs of ſuch as are of a generous excellent breed, put them under common, ordinary hens; and, when the chickens are hatched, they are brought up by them. The *Tanagrian*, being for the moſt part equal in ſize to the *Rhodian* and *Median*, are not much different in their manners from thoſe of our own country, as alſo the *Chalcidian*.

Nevertheleſs, of all theſe kinds, the baſtard chickens are the beſt, which our own *Italian* hens have brought forth, having conceived them by foreign males: for, they both retain their beautiful paternal ſhape, and their native ſalaciouſneſs and fruitfulneſs. I do not too much approve of dwarf fowls; neither on account of their fruitfulneſs, nor for any other advantage they may bring, unleſs their very low ſtature is pleaſing to any one: nor, indeed, do I like a male that is given to fighting, or whoſe amours make him quarrelſome; for, for the moſt part, he torments and vexes the other males, and will not ſuffer the females to couple with them, tho' he himſelf is not able to content many of them: therefore his ſaucineſs muſt be checked with a piece of leather, ſuch as they make bottles of; which, when it is made into a ſmall globular form, you cut it in the middle, and put the cock's feet into it, through that part which you have cut; and by this ſhackle, as it were, his fierce and ſavage manners will be kept within due bounds. But, as I propoſed, I ſhall now give directions relating to the care and management of the whole kind in general.

CHAP.

CHAP. III.

Of the right Contrivance and Making of an Hen-houſe.

HEN-houſes ought to be placed in that part of the manor-houſe which looks to the ſun-riſing in winter; let them be contiguous either to the oven, or to the kitchen, that the ſmoak may reach the place where the fowl rooſts, it contributing very much to the health of this kind eſpecially. The whole building deſigned for the hen-houſe, is to conſiſt of three cells, built cloſe to one another; of which, as I ſaid, the front, being all in one continued line, is to be turned towards the eaſt: then in this front let there be only one ſmall entry made into the middle cell; which itſelf ought to be the loweſt of the three, and ſeven feet every way: in this muſt be made one ſingle entry to each of the other cells in the right and left wall; and both entries muſt be joined to the wall that is oppoſite to ſuch as come in. But to this wall let there be an hearth applied, or a place for making a fire, of ſuch a length, that it may be no ſtop or hindrance to the foreſaid paſſages, and that the ſmoak may come from it into both cells; and let theſe have twelve feet both in length and in height, but no more breadth than the middle cell. Let their height be divided with lofts, which may have above them four, and below them ſeven feet, free from any incumbrance, becauſe the lofts themſelves take up one foot. Both lofts ought to be for the accommodation of the hens; and they ought to be illuminated by ſmall windows from the eaſt, one for each cell; which ſame windows may afford a paſſage for the fowls to go out by in the morning into the poultry-yard, as alſo an entry into the cells in the evening. But care muſt be taken, that they be always ſhut at nights, that the fowls may remain there in greater ſafety.

Below the lofts let greater windows be opened, and let them be fortified and ſecured with grates or croſs-bars, that noxious animals may not be able to creep in; nevertheleſs, in ſuch a manner, that the places may be throughly well lighted, that they may dwell the more conveniently: and the Poultry-keeper ought from time to time to ſearch and watch for the eggs of thoſe that are laying, and to conſider the condition of thoſe that the Hens are ſitting upon; for, even in thoſe places themſelves, it is proper to build the walls ſo thick, that they may admit of neſts cut out in rows for the hens; in which they

they may either lay their eggs, or hatch their chickens; for this is both wholſomer and neater, than that which ſome do, who drive ſtakes with great force into the walls, and place wicker-baſkets upon them. But whether you make hollow places in the walls for them, as I ſaid before, or place wicker-baſkets for them, there muſt be porches placed before them, by which the breeding hens may come to their neſts, either in order to lay their eggs, or to brood; for they ought not to fly into the neſts themſelves, leſt, when they leap into them, they break their eggs with their feet. Then there is an aſcending-place made for the fowls to go up into the lofts through both cells, by joining ſmall planks to the wall, which are made a little rugged by forming ſteps in them, that they may not be ſlippery when they fly to them. But let ſmall ladders likewiſe be applied to the foreſaid little windows from the poultry-yard, on the outſide, by which the fowls may creep in to take their night's reſt.

But, above all things, we muſt take care, that both theſe and the other aviaries, of which we ſhall preſently ſpeak, be well ſmoothed with plaiſter, both in the inſide and without, that neither cats nor ſnakes may have acceſs to the fowls, and other equally hurtful peſts may be hindered to enter. It is not proper, that the fowl ſhould ſit upon the loft when it ſleeps, leſt it be hurt with its own dung, which gives them the gout in their feet, when it ſticks to their crooked toes. That this deſtructive evil may be avoided, you muſt rough-hew poles, and cut them ſquare, leſt, when they are round and ſmooth, they do not receive and give a faſt hold to the fowl when it leaps upon them. Then you faſten the poles which you have made ſquare, in the two oppoſite walls, where you have made holes for them, ſo that they may be diſtant the ſpace of one foot in height from the loft, and of two feet in breadth from one another. This ſhall be the diſpoſition of the hen-houſe for the poultry-yard.

But let the poultry-yard itſelf, through which they ſtraggle, be not ſo free from dung as from moiſture; for it is of great importance, that there be no water in it, except in one place, which they may drink of, and that muſt be exceeding clean: for water which has dung in it gives them the pip: nevertheleſs you cannot keep it clean, unleſs it be put cloſe up in veſſels made for that purpoſe. There are leaden troughs, which are found by experience to be more uſeful, than either thoſe made of wood, or of potters earth; and you may fill them either with water or food. Theſe are ſhut up by putting covers upon them, and have ſmall holes made in their ſides above the middle part of their height, at the diſtance of an hand-breadth the one from the

other, ſo that they may admit the heads of the fowls: for, unleſs they be ſecured with covers, whatever quantity of water or food is in them, is ſweeped out with their feet. There are ſome who make holes in the upper-part in the covers themſelves, which ought not to be done; for the fowl, leaping up upon it, fouls both its water and its food with its excrements.

CHAP. IV.

Of Food proper for Hens.

THE beſt victuals given to hens are bruiſed barley and tares, as alſo the chichling, and millet or panic: but theſe are given only when the low price of corn permits it; but where corn is dearer, the ſmall ſiftings and refuſe of wheat are very convenient food for them: for it does not turn to any advantage to give them that corn by itſelf, even in thoſe places where it is cheapeſt, becauſe it is hurtful to the fowls. Boiled darnel alſo may be thrown before them; brawn likewiſe, from which the meal is not intirely ſifted; which, if it has no meal in it, is not proper for them: nor have the fowls ſo great appetite for it. When they are faſting, the leaves and ſeeds alſo of the *cytiſus*, (ſhrub-trefoil) are very much approved, and very acceptable to this kind of fowl: nor is there any country where there may not be even the greateſt plenty of this little tree. Huſks and kernels of grapes, tho' they are tolerable food for them, ought not to be given them, except at ſuch times of the year when the fowl is not laying her eggs; for they make them lay very ſeldom, and make their eggs very ſmall. But when, after autumn, they wholly ceaſe from laying, they may be ſuſtained with this kind of food. Nevertheleſs, whatever kind of food you ſhall give them, while they are wandering up and down the poultry-yard, it muſt be diſtributed to them twice; when the day begins, and when it is declining towards the evening; that in the morning they may not preſently wander at too great a diſtance from their lodging, and may, in hopes and expectation of their food, return in better time to the hen-rooſt in the evening; and that the number of their heads may be more frequently reckoned up: for your volatile cattle eaſily deceive the watchfulneſs and obſervation of their feeder.

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Dry duſt alſo, and aſhes, muſt be placed hard by the walls, wherever a porch or houſe ſhelters the hen-houſe, that the fowls may have wherewithal to ſprinkle themſelves; for with theſe things they clean their feathers, and their pinions, if ſo be we give credit to *Heraclitus* the *Epheſian*, who ſays, that ſwine are waſhed with mire and dirt, and poultry-yard fowls with duſt or aſhes. The hen ought to be let out after the firſt, and ſhut up before the eleventh hour of the day. This ſhall be the way of managing her that wanders up and down, as I have already deſcribed it: nor is that of her, which is ſhut up in the houſe, different from it; except, that ſhe is not allowed to go abroad, but is fed thrice a day within the aviary, with a greater quantity of food: for four *cyathi* of food is the daily allowance of each head, when only three or two are given to ſuch as wander up and down. A hen alſo that is ſhut up, muſt have a large porch, where ſhe may go forth and baſk herſelf; and let it be ſecured and defended with nets, leſt an hawk, or an eagle, fly into it: which expences and cares it is not expedient to beſtow, except in ſuch places where theſe things bear a very high price. But, with reſpect to all cattle in general, and this alſo in particular, the chief and principal thing is, the fidelity of the Keeper; which unleſs he preſerves to his maſter *inviolate*, no gain or advantage of the aviary will ſurmount the expences. There has been enough ſaid of the way of managing and keeping them: we ſhall now proſecute in order what we further propoſed.

CHAP. V.

Of preſerving the Eggs, and ſetting them under the Hens.

WHEN the middle of winter is paſt, this kind of fowls, for the moſt part, is wont to breed; and ſuch of them as are the moſt fruitful, in warmer climates, begin to lay their eggs about the firſt of *January*; but in cold countries, they begin after the fifteenth of the ſame month: but their fruitfulneſs muſt be drawn out with proper food, that they may bring forth the ſooner. Parboiled barley is excellent food for them; and you may give it them to ſatiety, for it makes their eggs of a larger growth, and makes them lay the more frequently. But this food muſt be ſeaſoned, as it were, by throwing leaves of *cytiſus*, (ſhrub-trefoil) as alſo the ſeed of the ſame among it, both which are thought exceedingly to increaſe the fruitfulneſs of

fowls. But let the quantity of food be, as I ſaid before, two *cyathi* of barley to ſuch as wander up and down: nevertheleſs, ſome quantity of ſhrub-trefoil muſt be mixed with it; or, if this cannot be had, ſome millet or tares.

But the Keeper muſt take care, that the fowls, when they bring forth, have their neſts ſtrawed with the very cleaneſt ſtraw; and that he ſweep them from time to time, and put other ſtraw, the freſheſt that can be had, into them: for they are full of fleas, and other ſuch-like animals, which the fowl brings with herſelf, when ſhe returns to the ſame neſt. The Keeper ought to be very aſſiduous, and to watch them when they are laying; which the hens declare they are doing, by frequent cacklings with a ſhrill voice, or ſhriek intermixed, from time to time. Therefore he ought to be upon the watch while they are laying their eggs, and muſt preſently go round their neſts, that he may gather up what they have laid, and mark ſuch as are laid every day, that ſo the very freſheſt may be ſet under clucking hens: for ſo do people that live in the country call thoſe that have a deſire to brood; and let the reſt of the eggs be either laid up, or exchanged for money.

Moreover, the freſheſt eggs (1) are the moſt proper for hatching; yet ſuch as are ſtale may be ſet, provided they be not above ten days

(1) *Pliny*, in his *Natural Hiſtory*, ſpeaking of eggs, ſays, that ſome of them are white, as thoſe of pigeons and partridges; ſome pale, as thoſe of water-fowls; others diſtinguiſhed by points or ſpots, as thoſe of the *Meleagrides*; ſome of a red colour, as thoſe of pheaſants, and ſome ſorts of hawks: that the inſide of the eggs of all fowls is of two colours; that thoſe of water-fowls have more of the yellow than of the white; and that the yellow part is more lucid than that of other fowls; that thoſe of water-fowls are round, but thoſe of other ſorts are commonly ſharp, and drawing to a point at one end; and that when they are laid, the roundeſt part comes out firſt; that, when they are firſt laid, the ſhell is ſomewhat ſoft, but preſently hardens with the air. *Horace*, it ſeems, thought, that thoſe of an oblong figure are of a more grateful taſte. *Pliny* adds, that the rounder produce the female, and the others the male: that the navel of the egg is in its top, like a drop, riſing up upon the ſhell: that ſome fowls gender, and bring forth always, except two months in the middle of winter, as common farm-houſe hens; and that the younger lay more eggs than the elder, but of a ſmaller ſize; and that, at the different births, thoſe they lay firſt and laſt are the ſmalleſt; and that their fecundity is ſo great, that ſome of them have laid ſixty eggs at one laying, before they gave over laying; ſome lay once every day, ſome twice, yea ſome have ſo far exhauſted themſelves, that they have died with laying: that in the middle of the yolk of all eggs there is, as it were, a ſmall bloody drop, which, ſome think, is the heart of the animal; and are of opinion, that, in every body, this is the firſt thing that is formed. But *Ariſtotle* ſays, that this drop is in the white of the egg, *Hiſt. animalium*, *lib.* vi. *cap.* 4. and that this drop palpitates and moves, as if it were animated: that the body of the animal itſelf is formed of the white liquor of the egg, and nouriſhed by the yellow; *Ariſtotle* was alſo of this opinion. But it ſeems *Hippocrates* was of a different opinion; for he ſays, that the bird is formed of the yellow part, and nouriſhed by the white. But *Harvey* differs from them

days old. But, for the moſt part, hens, after they have completely finiſhed their firſt birth, are deſirous to ſit upon their eggs about the thirteenth day of *January*, which they muſt not at all be permitted to do; becauſe, indeed, the young hens are more uſeful for laying than for hatching eggs; and their deſire of brooding is checked by paſſing a ſmall quill through their noſtrils: therefore, veteran fowls muſt be choſen for this buſineſs, which have frequently done it already: and their manners and diſpoſition eſpecially muſt be throughly known, becauſe ſome of them are beſt for brooding, others of them bring up the chickens in a better manner after they are hatched; but others of them, on the contrary, break and deſtroy both their own eggs, and thoſe of others; and, when any of them is found ſo doing, it will be proper forthwith to put her out of the way.

But the chickens of two or three fowls, being hatched, ought, while they are yet very young, to be transferred to one of them, which may be the better nurſe; but this muſt be done the very firſt day, while the dam cannot, becauſe of their likeneſs, diſtinguiſh her own from thoſe of others: nevertheleſs, you muſt keep to a certain number; for it ought not to be greater than that of thirty heads; for they deny, that a greater flock than this can be nurſed by one. They obſerve, that the eggs, which are ſet under the hen, be of an unequal number, and not always the ſame: for in the firſt ſeaſon, that is, in the month of *January*, fifteen, and never more, ought to be ſet: in the month of *March*, nineteen, and not fewer than theſe; twenty-one in the month of *April*; then, during the whole ſummer, the ſame number: afterwards any further care about this matter is to no purpoſe; becauſe chickens hatched during the colds, for the moſt part, periſh. Nevertheleſs moſt people think, that even after the

them both; and ſays, it is both formed of, and nouriſhed by, the white, till it grows big; ſee his *Exercitat.* 52. That, when the chicken grows bigger, the white is turned into the middle, and the yellow circumfuſed: that the 20th day, if the egg be moved, the voice of the chicken may be heard within the ſhell: that from that day its feathers grow upon it: that it is ſo placed in the ſhell, that it has its head upon its right foot, and its right wing above its head: that the yolk decreaſes by little and little: that it is beſt the eggs be ſet under the hen within ten days after they are laid, becauſe ſuch as are ſet ſooner or later are unfruitful: that the 4th day after they are ſet, if you take them in your hand, and look to the top of them againſt the light, if the colour be pure and pellucid, and of one ſort, they are barren, and others are to be put in their place; or, if they float upon water, they are empty, and others that ſink are to be put in their room: that they ought not to be ſhaken, becauſe it confounds the vital veins: that they ought to be ſet after the new moon, becauſe otherwiſe they will not hatch: that in warm weather they hatch ſooner than in cold; therefore in ſummer they bring forth their young the 19th day, and in winter the 25th. What *Pliny* ſays further, is moſtly contained in our author.

ſummer

ſummer ſolſtice, it is not a good time for hatching of chickens; becauſe from that time, although they are eaſily brought up, yet they never come to their juſt growth. But in places that lie near the city, where chickens from their dams are ſold at no ſmall prices, and where they do not periſh for the moſt part, the bringing them up in the ſummer-time is to be approved.

But, when eggs are ſet, care ought always to be taken, that it be done when the moon is increaſing, from the tenth to the fifteenth; for both the ſetting of the eggs itſelf, almoſt during theſe days, is moſt convenient, and turns to moſt advantage; and matters muſt be ſo managed, that the moon may be upon the increaſe again, when the chickens are hatched. One-and-twenty days are requiſite for animating the eggs of this kind of common poultry-hens; but a little more than twenty-ſeven for the peacock and gooſe-kind: which if, at any time, it be found neceſſary to ſet under common poultry-hens, we muſt firſt ſuffer them to ſit ten days upon the eggs of thoſe fowls of a different ſpecies; then they ſhall receive four eggs of their own kind to hatch, and never more than five; and theſe muſt be of the largeſt ſize; for of very ſmall eggs ſmall birds are hatched: then, if any one ſhall deſire, that moſt males be hatched, he muſt ſet all the longeſt and the ſharpeſt eggs; and on the other hand, if he have a mind for females, he muſt ſet the roundeſt he can find.

But the uſual manner of ſetting eggs under hens, delivered to us by thoſe who manage theſe things with greater ceremony and ſuperſtition, is ſuch as this: Firſt, they chooſe the moſt retired neſts they can find, that the brooding hens may not be diſquieted by other fowls: then they clean them carefully before they put ſtraw into them, and throughly purify the ſtraw they are going to lay under them, with ſulphur, bitumen, and a burning torch; and, after they have expiated it, they throw it into their beds, and ſo make hollow neſts for them, leſt, when they fly into them, or leap out of them, the eggs be rolled out, and fall down. Very many people alſo lay a little graſs, or ſmall branches of laurel, under the ſtraw, in their neſts; as alſo heads of garlick with iron nails: all which things are believed to be remedies or preſervatives againſt thunders, whereby the eggs are ſpoiled, and the half-formed chickens are deſtroyed before they are perfected in all their parts. But he that ſets the eggs obſerves, not to lay them into the neſt in order with his hand, one by one; but puts their whole number together into a ſmall wooden tray, and then pours them all out gently into the neſt prepared for them. But food muſt be placed hard by ſuch hens as are brooding, that ſo when they have

their

their belly full, they may with more eagerneſs continue in their neſts, and not cool their eggs by wandering at too great a diſtance from them; and although they themſelves turn them with their feet, yet the Keeper of the poultry, when the dams leap down from their neſts, ought to go round, and turn the eggs with his hand, that, receiving the heat equally, they may be eaſily animated; and alſo, that, if any of them be hurt or broken with their claws, he may remove them. And when he has done this, let him obſerve, upon the nineteenth day, whether any of the chickens have, with their little bills, broke through the eggs, and let him liſten if they peep or chirp; for oft-times they cannot break out, becauſe of the thickneſs of the ſhells: therefore with his hand he muſt take out the chickens that ſtick in the ſhell, and put them under their dam, that ſhe may cheriſh and keep them warm: and he muſt not do that longer than three days; for, after the one-and-twentieth day, eggs that are ſilent have no living creatures in them: and theſe muſt be removed, that the hen, not having been able to hatch them, may not, with vain hope, be detained longer brooding to no purpoſe.

You muſt not take away the chickens one by one as they are hatched, but you muſt ſuffer them to ſtay one day in the neſt with their dam; and keep them from food and water till they be all hatched. The next day, when the whole brood is hatched, they are brought down from *the neſt* in this manner: let the chickens be placed either upon a tare- or a darnel-ſieve, which has been already in uſe; then let them be fumigated with ſprigs of penny-royal. This thing ſeems to prevent their having the pip, which very ſpeedily kills them when they are very young. After theſe things, they muſt be ſhut up with their mother in a coop, and moderately fed with barley-meal, or with the fine flour of wheat-meal ſprinkled with wine; for crudity is moſt to be avoided: and for this reaſon they muſt be kept in the coop the third day with their dam; and, before they are let out to their freſh victuals, they muſt be tried one by one, if they have any thing of yeſterday's food in their gorge: for if their crop is not empty, it is a ſign of indigeſtion; and they ought to be kept from food till they have digeſted.

But, while they are very young, they muſt not be allowed to wander and ſtraggle at too great a diſtance, but be kept about the coop, and fed with barley-meal till they gather ſtrength: and you muſt take care, that they be not blown upon by ſerpents, the ſmell or breath of which is ſo peſtilential, that it intirely kills them all. This is prevented by burning harts-horn frequently, or galbanum, or womens hair;

hair; by the burning ſmell of all which, for the moſt part, the fore-ſaid peſt is removed, and kept at a diſtance. But care alſo muſt be taken to keep them gently warm, for they can neither bear heat nor cold; and it is beſt to keep them ſhut up within the hen-houſe with their dam, and after the fortieth day to give them full liberty to wander up and down. But the firſt days of their infancy, as it were, they muſt be often handled and dreſſed, and the ſmall feathers under their tails plucked off their buttocks, leſt they grow hard when they are bedaubed with their dung, and obſtruct their natural paſſages. And tho' due care is taken to prevent this, nevertheleſs it often happens, that their belly has no paſſage: therefore they pierce it through with a quill, and open a way for the digeſted food.

But now, when the chickens are grown ſtronger, care muſt be taken to preſerve both them and their dams from that deſtructive diſtemper the *pip*; to prevent which, we muſt give them the very pureſt water in the cleaneſt veſſels; likewiſe we muſt conſtantly fumigate the hen-houſes, and throughly cleanſe them, and free them from dung. But if, nevertheleſs, the plague breaks in, and ſpreads itſelf among them, there are ſome who thruſt into their gorge cloves of garlick moiſtened in lukewarm oil. Some wet their mouths with a man's lukewarm urine, and compreſs them ſo long, till the ſaltneſs of the urine forces them to preſs out the nauſeous phlegm through their noſtrils. The berry alſo, which the *Greeks* call ἀγρία ϛαφυλὴ, (wild grape) mixed with their meat, is of great benefit to them; or the ſame bruiſed, and given them with water for their drink. And theſe remedies are applied to ſuch of them, as are not infected with the diſtemper to any great degree: for if the pip ſurrounds their eyes, and the fowl refuſes its victuals, they lance their cheeks, and ſqueeze out all the corrupt matter that is gathered under their eyes; and ſo they ſprinkle a little bruiſed ſalt upon the wounds.

Moreover, this diſeaſe ariſes chiefly when the fowls are much pinched with cold, and in diſtreſs with want of food; alſo when they drink the ſtanding water in the poultry-yards during the ſummer: alſo when they allow them figs and unripe grapes, but not their belly-full of them, from which kind of food fowls ought carefully to be kept. And the wild grape, gathered out of the thickets before they are ripe, will effectually make them loath it, when, after they are boiled with ſmall flour of wheat-meal, they are thrown before them when they are hungry; for the fowls, being offended with their taſte, deſpiſe all grapes whatſoever. The wild fig produces the ſame

effect

effect alſo; which they boil, and give to the fowls with their meat, and ſo it creates a loathing of figs.

Let the cuſtom, which is commonly obſerved with reſpect to other cattle, of picking out all the beſt, and ſelling the worſt, be obſerved alſo in this kind, that every year, in the autumn, when their fruit ceaſes, their number alſo may be diminiſhed. But we muſt remove out of the way thoſe that are old, that is, which exceed three years of age; alſo ſuch as are not very fruitful, or but very indifferent nurſes; and eſpecially ſuch as deſtroy either their own eggs, or thoſe of others: nor muſt we be leſs careful to remove ſuch of them as have begun to crow, or to tread alſo, as the males do; lateward chickens alſo, which, being hatched after the ſolſtice, cannot arrive at their due growth.

But the ſame method muſt not be obſerved with reſpect to the males; but we will keep ſuch of them as are generous, as long as they can impregnate the female: for it is a rare thing to find among theſe fowls one that will prove a good huſband. At the ſame time alſo, when the fowls ceaſe to breed, that is, from the thirteenth of *November*, their more coſtly food muſt be withdrawn from them, and huſks and kernels of grapes muſt be given them, which are a food convenient enough for them, when the refuſe and ſiftings of the wheat are ſometimes added to them.

CHAP. VI.

Of Eggs.

THE keeping and preſerving of eggs for a longer time alſo, is not foreign to this care: they are kept in very good order during the winter, if you cover them over and over with chaff, or corn-ſtraw; and in ſummer with bran. Some cover them all over firſt with bruiſed ſalt for ſix hours, and then waſh them, and ſo lay them deep in ſtraw, chaff, or bran: ſome lay them in a heap of unbroken beans; others in beans that are bruiſed: ſome cover them with unbruiſed ſalt; others harden them in lukewarm brine. But all manner of ſalt, as it does not ſuffer the eggs to rot, ſo it diminiſhes them, and does not let them continue full; which thing deters the buyer. Therefore even they who put them into brine, do not preſerve them ſound and intire.

CHAP. VII.

Of fattening, and cramming of Hens.

ALthough it is the buſineſs of a Poulterer, and not of an Huſbandman, to fatten an hen alſo; nevertheleſs, becauſe there is no great difficulty nor charges in doing it, I thought it proper to give directions concerning it. An exceeding warm place, and of very little light, is requiſite for this purpoſe; wherein the fowls may be ſhut up, one by one, in very narrow coops, or in hanging baſkets; but ſo ſtraightened, that they may not be able to turn themſelves. But let them have holes on both ſides; one where they may put out their head at; and another where they may put out their tail and buttocks, that they may be able both to take their meat, and, when it is digeſted, ſo to throw it out, as they may not be bedawbed with their dung. But let the very cleaneſt corn-ſtraw be ſpread under them, or ſoft hay, that is, hay of the ſecond crop; for, if they lie hard, they do not eaſily grow fat. Let all their feathers be plucked clean off their heads, from under their wings, and off their buttocks: there, that they may not breed lice; and here, that they may not with their dung ulcerate the natural paſſages of their body.

But they give them barley-meal for their food; of which, when they have ſprinkled it with water, and kneaded it, they make pellets, and fatten the fowls therewith. But theſe ought to be given more ſparingly the firſt days, till they be accuſtomed to digeſt a greater quantity; for indigeſtion is eſpecially to be avoided; and as much muſt be given them as they can digeſt: nor muſt freſh victuals be ſet before them till you feel their crop, and it appear, that nothing of their old food remains therein. Then, when the fowl has filled its belly, they put down the coop a little, and let it go out, but ſo that it may not wander up and down, but rather that it may purſue, with its bill, whatever pricks or bites it. This is almoſt the common care of thoſe who cram fowls in order to fatten them.

But they who are deſirous not only to make their fowls fat, but alſo tender, ſprinkle that kind of meal before-mentioned with freſh mead, and ſo cram them. Some mix one part good wine with three parts water, and with wheat-bread ſoaked therein fatten the fowl; which, beginning to be fattened with the new Moon, (for this alſo muſt be obſerved) grows plump, and is throughly fattened on the twentieth

twentieth day: But if it loaths its food, you muſt diminiſh it as many days as are paſt ſince you began to cram them; yet ſo, as the whole time of fattening them may not go beyond the twenty-fifth day of the Moon. But it is beſt, and what one ought always to propoſe to himſelf, to deſtinate all the largeſt fowls for the more ſumptuous entertainments; for ſo a worthy and ſuitable reward follows their pains and expences.

CHAP. VIII.

Of cramming of Wood-pigeons, or Ring-doves, or tame Pigeons, that breed in little Cells about the Houſe; and of making Pigeon-houſes.

BY this ſame method you may make wood-pigeons, or ring-doves, and tame pigeons, that keep in little cells about the houſe, exceeding fat; nevertheleſs, there is not ſo great an income redounding from cramming pigeons, as from bringing them up: for the having of theſe things alſo in poſſeſſion, is not unſuitable to, or unbecoming the care of, a good Huſbandman. But this kind is fed with leſs care and attendance in diſtant regions, where the fowls have a free egreſs allowed them; becauſe they frequent the ſeats aſſigned them either upon the tops of towers, or on the higheſt edifices, where the windows ſtand wide open, by which they fly out to ſeek their food. Nevertheleſs, for three or four months they willingly accept of food laid up in ſtore for them; the reſt of the months they feed themſelves with ſeeds they gather in the fields. But this they cannot do in places contiguous to the city, becauſe they are intercepted by various ſnares and traps of fowlers: therefore they ought to be ſhut up, and fed in the houſe; but neither in a place of the manor-houſe that is even with the ground, or in one that is cold; but a loft muſt be made for them in an high place, which may look to the Sun at noon in winter.

And that we may not repeat thoſe things that have been already ſaid, let the walls thereof, as we directed in the aviary, be made hollow with neſts all in a line, one after another; or, if there be no conveniency to make it ſo, let boards be put upon ſmall ſtakes driven into the wall, which may receive either ſmall lockers wherein the fowls may make their neſts; or earthen pots for them to breed in,

with porches placed before them, by which they may come to their neſts. But the whole place, and the pigeon-cells themſelves, ought to be poliſhed with white plaſter, becauſe this kind of fowl is exceedingly delighted with this colour. Likewiſe the outſide of the walls ought to be ſmoothed, eſpecially about the window; and let that be ſo placed, that it may admit the Sun the greater part of the winter-day. And let it have a large-enough gallery or balcony joined to it, ſecured with nets, which may keep out hawks, and receive the pigeons which come out to baſk themſelves; and likewiſe afford a paſſage to go out into the fields, for ſuch of the breeding pigeons as are brooding either upon their eggs, or young ones, leſt, being diſheartened, as it were, with the grievous ſervitude of perpetual impriſonment, they grow old: for, after they have flown a little about the buildings, they are exhilarated and refreſhed, and return more lively and briſk to their young ones, for whoſe ſake they do not indeed endeavour to rove up and down to any great diſtance, nor to fly away.

The veſſels, wherein water is given them, ought to be like thoſe uſed in poultry-yards or hen-coops, which may only admit the necks of thoſe that drink; and, becauſe of their narrowneſs, not receive thoſe that deſire to waſh themſelves: for their doing this is neither expedient for their eggs, nor their young ones, on which they for the moſt part ſit brooding. Moreover, it will be proper to ſcatter their food hard by the wall, becauſe thoſe parts of the pigeon-houſe are almoſt free from dung. Tares, or bitter vetches, are reckoned the moſt convenient food for them; as alſo ſmall lentils, millet and darnel, and the refuſe and ſiftings of wheat; and if there be any other ſorts of pulſe wherewith hens alſo are nouriſhed.

But the place ought to be ſwept and cleaned from time to time; for how much the more garniſhed it is, ſo much the more chearful and briſk the fowl appears; and it is ſo ſqueamiſh, that frequently, abhorring its own places of abode, it abandons them, if it have liberty to fly away; which often happens in thoſe regions where they have free egreſs. To prevent this, there is an antient precept of *Democritus:* there is a kind of hawk, which people that live in the country call a *keſtrel*, which commonly makes its neſt in buildings; this hawk's young ones are ſhut up one by one in earthen pots, and the covers are put upon them while they are yet breathing, and the veſſels, being covered with plaſter, are hung up in the corners of the pigeon-houſe; which thing does ſo conciliate the love of the fowls to the place, that they never abandon it. Such of the females as are neither old, nor too young, muſt be choſen for bringing up young

ones; but they muſt be of the largeſt bodies: but care muſt be taken, if it can be done, that the young pigeons be never ſeparated, but kept together in the manner they were hatched: for, if they be married after this manner, they for the moſt part bring up more young ones; if otherwiſe, let not ſuch at leaſt as are of another kind be joined together, as the *Alexandrian*, and the *Campanian*; for they have leſs love for their mates that are not like themſelves, and therefore they do not couple much with them, nor do they often breed.

The ſame colour of feathers is not always, nor by all, approved; therefore, which may be the beſt it is not eaſy to tell: the white, which is commonly ſeen every-where, is not too much commended by ſome: nevertheleſs, it ought not to be avoided in thoſe that are ſhut up in a cloſe place; for, in ſuch as wander up and down, it is principally to be diſliked, becauſe the hawk eſpies it very eaſily.

But their fecundity, tho' it be much leſs than that of hens, nevertheleſs, it brings in a greater gain: for, if a pigeon be a good breeder, ſhe brings up young ones eight times in a year, and with their prices the owners fill their coffers, as *Marcus Varro* (1), an excellent author, aſſures us; who has told us, that even in thoſe ſeverer times in which he lived, ſingle pairs uſed to be ſold for one thouſand ſeſterces each. For I am aſhamed of our own age, if we will believe, that there are ſome to be found, who pay four thouſand nummi for a couple of birds (2); although I think even theſe more ſufferable, who put their delights, and darling amuſements, in the balance with great ſums of money, merely for the ſake of having them in their poſſeſſion, than thoſe who empty the river *Phaſis* in *Pontus* (3), and

(1) *M. Varro, lib.* iii. 7. ſays, that there is nothing more fruitful than doves: for in 40 days they conceive, lay their eggs, hatch, and bring up their young; and that they do this almoſt the whole year, only they intermit from the winter ſolſtice to the vernal equinox; that they who fattened them, in order to ſell them at an higher price, ſhut them up as ſoon as they were covered with feathers, and crammed them with chewed bread; and in ſummer they fed them three times a day, in the morning, at noon, and in the evening; but in winter, twice only. And of ſome of them, when their pinions begin to grow, they break the legs, and leave them in their neſts, throwing food to their dams, who feed their young all the day long; that ſuch of them as are thus fed grow ſooner fat, and are whiter than others; and that the old ones, if they were beautiful, and of a good colour, and good breeders, were ſold at *Rome* for 200 nummi a pair, which in *Engliſh* make 1*l.* 12*s.* 3*d* ½; and ſuch of them as were more beautiful than ordinary, ſold for 1000 nummi, in *Engliſh* money 8*l.* 1*s.* 5*d.* ½. And that ſome refuſed to take leſs than 400 denarii, in *Engliſh* money 12*l.* 18*s.* 4*d.*

(2) Our author ſays, that he was aſhamed of the age he lived in, if it could be believed, that there were ſome who paid 4000 nummi for two birds, (I ſuppoſe of that kind) in *Engliſh* money 32*l.* 5*s.* 10*d.*

(3) *Phaſis*, a famous river of *Colchis* in *Pontus*, much celebrated by the expedition of the

and the *Scythian* lakes of *Mæotis* (4), *of all their fowls*; and who even at this time, in their drunkenneſs, belch out and vomit up fowls brought from the *Ganges* (5), and from *Egypt*.

Nevertheleſs, in this aviary alſo may be carried on the buſineſs of fattening fowls: for if there be any among them that happen to be barren, or of a ſordid diſagreeable colour, they are crammed after the ſame manner as hens are. But young pigeons grow more eaſily fat under their dams, if, when they are grown ſomewhat ſtrong, before they begin to fly a little, you take away a few quills from them, and bruiſe their legs, that they may reſt in one place; and if you give plenty of food to thoſe that have hatched them, wherewith they may the more abundantly nouriſh both themſelves and them. Some tie up their legs gently, becauſe, if they be broken, they think that they ſuffer great pain, and thereby become lean: but that thing contributes nothing at all to their fatneſs; for, while they endeavour to get rid of their bonds, they never reſt; and by this conſtant exerciſe, as it were, they add nothing to their body. Their broken legs give them pain not above two, or three days at moſt; and they deprive them of all hopes of going abroad, and of wandering up and down.

CHAP. IX.

Of the bringing up of Turtle-doves.

THE bringing up of turtle-doves is of no advantage, becauſe that kind neither lays eggs, nor hatches, in an aviary; they are deſtinated for cramming, ſo as they are taken from the flight: therefore they are fattened with leſs trouble and care than other fowls, but not at all times. During the winter, tho' pains be beſtowed upon

the *Argonautæ*: from this river, they ſay, pheaſants have their name; either becauſe they abound moſt there, and aſſemble in great numbers at the mouth of that river, to gather their food; or were firſt brought from thence by the *Argonautæ*, as *Martial* ſays, *lib.* xiii. *Epigram* 72. in whoſe days it was reckoned a great luxury to feaſt on pheaſants.

(4) *Mæotidis ſtagna Scythica*; by *Pliny* called *lacus Mæotius*, and *palus Mæotis*. It lies between the *Leſſer Tartary* or *Tartaria Procopenſis*, and *Circaſſia*, a country of *Aſia*. It is a large gulph, or rather a ſea: it is called a lake, becauſe it is ſo ſhallow in many places, that larger veſſels cannot ſail in it. It is joined to the *Euxine* ſea by the *Boſporus Cimmerius*; the river *Tanais* runs into it.

(5) *Ganges*, a very great river in *India*, which runs through the dominions of the Great Mogul, and empties itſelf into the gulph of *Bengal*.

them,

them, it is difficult to fatten them; and yet then the price of turtles is lower, becauſe there is then greater plenty of thruſhes. Again, in ſummer they grow fat, even of their own accord, provided they have abundance of food: for there is nothing more to be done, but to throw their food before them, but eſpecially millet; not becauſe they fatten leſs with wheat, or other ſorts of corn, but becauſe they are moſt delighted with millet-ſeed. Nevertheleſs, in winter, pellets of bread ſoaked in wine fatten them, as alſo wood-pigeons, more quickly than other ſorts of food.

They do not make lockers, or ſmall hollow cells, for receptacles for them, as they do for tame pigeons; but brackets faſtened into the wall, all in a line, receive ſmall hempen mats; with nets ſpread before them, whereby they may be hindered to fly; becauſe, if they do this, they impair their bodies. And, in theſe receptacles, they are continually fed with millet or wheat: but theſe ſeeds muſt not be given them, except they be dry. And half a *modius* of this food, for every day, will abundantly ſatisfy one hundred and twenty turtle-doves: and freſh water, and the cleaneſt that can be had, is given them in ſmall veſſels, ſuch as they uſe for hens and pigeons. And their little mats muſt be cleaned, leſt their dung burn their feet, which itſelf ought alſo to be carefully laid up for the culture of lands, and of trees; as alſo that of all other fowls, except of thoſe that ſwim. This fowl is not ſo fit for fattening when it is old, as when it is very young: therefore about the time of harveſt, now when the young brood is grown ſtrong, they are choſen for this purpoſe.

CHAP. X.

Of the bringing up of Thruſhes.

GREATER pains and expences are beſtowed upon thruſhes, which, indeed, are fed in every country-place, but more wholſomely in that wherein they are taken; for they are with difficulty removed into another country, becauſe they deſpond, and loſe heart, when they are ſhut up in cages; which they alſo do, when, the ſame moment they are taken out of the net, they are thrown into aviaries: therefore, that this may not happen, ſome that are old ought to be mixed with them; which, being bred up and nouriſhed by the Fowler for this uſe, may, as it were, ſooth and cajole the priſoners, and mitigate

mitigate their ſorrow by flying up and down amongſt them. They require a place equally ſecure, and as much expoſed to the Sun, as doves do: but in it you muſt faſten tranſverſe poles, and fit them to holes made in the oppoſite walls, upon which they may rooſt when they have a mind to reſt, after they have filled their bellies. Theſe poles ought not to be raiſed higher from the earth, than a man's ſtature may allow, that he may be able to touch them when he ſtands.

Their food is commonly placed in thoſe parts of the aviary, which have not poles over them, that it may be kept the cleaner: but dry figs, carefully bruiſed and well mixed with fine flour, ought always to be given them, and, indeed, ſo largely, that ſome part may remain. Some chew them, and ſo throw them before them; but it is ſcarcely expedient to do this, where there is a great number of them, becauſe they who chew them are not hired for a ſmall matter; and they themſelves always conſume ſome part of them, becauſe of their ſweetneſs. Many think, that a variety of food ought to be given them, leſt they loath one ſort; and that is, when the ſeeds of the myrtle- and maſtich-trees, wild olive, and ivy-berries alſo, and thoſe of the ſtrawberry-tree, are thrown before them; for commonly, in the open fields alſo, this ſort of wild fowl likes and ſeeks after theſe things, which wipe off and remove the nauſeating of ſuch of them as ſit loitering in the aviaries, and makes the whole volary more greedy and voracious, which is a very great advantage; for with a larger quantity of food they ſooner grow fat. Nevertheleſs, you muſt alſo always place by them ſmall troughs filled with millet, which is their firmeſt and moſt ſolid food; for theſe things, which we have mentioned above, are given them by way of dainties.

Let not the veſſels, wherein freſh and clean water may be given them, be unlike thoſe made uſe of for hens. *Marcus Terentius* informs us, that, in our grandfathers times, by this expence and care, theſe birds were frequently bought for three *denarii* each (1), with which they who triumphed made entertainments for the people. But now the luxury of our age has made this to be their ordinary price every day; for which reaſons, indeed, this income muſt not be deſpiſed and ſet at nought by Huſbandmen. We have already treated of thoſe kinds which are provided with food within the precincts of the manor-houſe; now we muſt ſpeak of thoſe, which have liberty alſo to go out to gather their food in the open fields.

(1) *Varro, lib.* iii. *cap.* 2. Three denarii, in *Engliſh* Money, make 1*s.* 11$\frac{1}{4}$ *d.*

CHAP.

CHAP. XI.

Of the Bringing up of Peacocks.

THE education of peacocks requires rather the care of a gentle Houſholder, who dwells in a city, than of a crabbed, ſurly Ruſtic; but neither is this foreign to the buſineſs of an Huſbandman, who is always endeavouring to procure to himſelf pleaſures from all ſides, wherewith all the ſolitudes and irkſomeneſs of the country may be ſoftened and allayed: for the beauty and comelineſs of theſe birds not only gives delight to their owners, but alſo to ſtrangers. Therefore, this kind of fowl is very eaſily kept in ſmall woody iſlands, ſuch as lie up and down the coaſt of *Italy*. For becauſe it can neither fly high, nor over any great ſpace of ground, as alſo becauſe there is no fear of the rapine of thieves, or of noxious beaſts, it wanders up and down ſafely without a Keeper, and acquires for itſelf the greateſt part of its nouriſhment. The females indeed, as if they were diſcharged from bondage, bring up their young ones, of their own accord, with greater care. Nor ought he that has the care of them to do any other thing, but, by giving a ſignal at a certain time of the day, to call together the whole flock near the manor-houſe, and to throw a little barley before them, when they come together, that the fowls may not be hungry; and that he may review them, and count the number of thoſe that come to the place.

But it is rare to have the conveniency of a poſſeſſion of this kind: wherefore, in inland countries, greater care muſt be taken of them; and let them be managed in this manner: you muſt incloſe, with an high fence or wall, a piece of even, graſſy, and woody land, to the three ſides of which you muſt apply porticos, and, on the fourth ſide, two cells, that one of them may be an habitation for their Keeper, and the other, a ſhelter or lodging-place for the peacocks: then, under the porticos, you muſt make incloſures with reeds, all in a row, in the manner of cages or coops, ſuch as they place upon the roofs of pigeon-houſes; theſe incloſures are diſtinguiſhed, *or ſeparated from one another*, by reeds running between them like bars, ſo that they may have one ſingle entry on both ſides. But their lodging-place ought to be intirely free from moiſture, in the floor of which muſt be faſtened ſhort ſmall ſtakes, all in a row, the uppermoſt parts of which muſt have tenons cut very ſmooth, which may be put into

holes made in tranſverſe poles. Moreover theſe poles, which are placed upon the ſmall ſtakes, ought to be ſquare, that they may receive the fowl, when it leaps upon them. But they are made ſo as to be taken away; that, when it is neceſſary, they may be taken down from the poſts, and give free acceſs to thoſe who ſweep the peacock-houſe.

This kind of fowl, when full three years old, breeds exceeding well; whereas their more tender age is either barren, or not very fruitful. The peacock has the ſalaciouſneſs of a common poultry-cock, and therefore requires five females; for if he frequently treads one or two of them that are laying, he mars their eggs, ſcarcely as yet formed in their wombs, and does not ſuffer them to be brought to the birth, becauſe they fall from their genital parts before they come to maturity.

In the latter end of winter, the amorous deſires of both ſexes muſt be kindled with food provocative of luſt. It contributes exceedingly to this matter, if you parch beans gently in embers that are not too hot, and give them lukewarm to them faſting every fifth day: nevertheleſs, you muſt not exceed the quantity of ſix *cyathi* to each fowl. Theſe victuals muſt not be ſcattered promiſcuouſly to them all; but they muſt be laid in each of the incloſures, which, I propoſed, ought to be woven with reeds, obſerving a proportion of five females and one male; water alſo, which is fit for drinking, muſt be ſet for them; when this is done, the males are conducted, without quarrelling, into their ſeveral incloſures with their females, and the whole flock is fed equally. For alſo, of this kind, there are found males given to quarrelling and fighting, who hinder thoſe that are not ſo ſtrong as themſelves both from their food, and from coition, unleſs they are ſeparated, and kept apart, in this manner. But commonly, in places expoſed to the ſun, the deſire of coition diſquiets and torments the males, when the gentle weſt winds have begun to blow, that is, the time from the thirteenth of *February* before the month of *March*. It is a ſign, that his luſt is ſtimulated, when he covers himſelf with the pinions of his tail, which gliſter as if they were ſet with precious ſtones, as if he were admiring himſelf; and, when he does that, he is ſaid to wheel, or be in his pride.

Preſently after the time of coupling, the pea-hens, that are breeding, muſt be carefully watched, that they may not lay their eggs in any other place, but in their ſtalls, where they lodge; and you muſt often, with your fingers, feel the parts of the females; for their eggs are very obvious to the touch, when their time of laying them draws near.

near. Therefore ſuch of them as are near the time of their laying muſt be ſhut up, leſt they lay their eggs without their incloſures: and eſpecially at thoſe times when they are going to lay, the aviary muſt be well filled with a great quantity of ſtraw, that their eggs may be preſerved, and received ſound and intire. For commonly, when the pea-hens are come to take their night's reſt, they lay their eggs when they are ſitting upon the forementioned poles; and the nearer and ſofter they fall, the leſs injury are they liable to receive, and the ſounder are they kept.

Therefore, during the times of their laying, you muſt daily, in the morning, go round the places where they rooſt, and gather the eggs that are lying there; and the freſher they are ſet under common poultry-hens, ſo much the more commodiouſly are they hatched: and it is moſt for the Houſholder's advantage, that this ſhould be done. For pea-hens, which do not ſit upon their eggs to hatch them, for the moſt part, lay eggs thrice in a year: but ſuch of them as ſit upon and hatch their own eggs, conſume the whole time of their fecundity either in hatching, or in bringing up their young ones.

Their firſt birth or laying is, for the moſt part, of five eggs; their ſecond of four; their third either of three or two: nor is there any pretence for being guilty of ſuch a miſtake, as to let *Rhodian* hens ſit upon pea-hens eggs, which do not, indeed, rightly nurſe and bring up their own offſpring. But, let all the largeſt veteran hens, of our own *Italian* breed, be choſen; and let them ſit on nine eggs, nine days from the firſt increaſe of the moon; and let five of them be pea-hens eggs, and the reſt of the common poultry-kind. Then, upon the tenth day, let all the common poultry-hens eggs be taken away, and as many freſh ones, of the ſame kind, put in their place, that they may be hatched with the pea-hen's eggs on the thirtieth day of the moon, which is almoſt new moon.

But let it not eſcape the care of the Keeper, to obſerve when the hen that is brooding leaps down, and to come frequently to her neſt, and turn the pea-hen's eggs with his hand, which, by reaſon of their bigneſs, are more difficultly moved by the hen: and, that he may do this the more carefully, one ſide of the eggs muſt be marked with ink, which the keeper of the aviary ſhall have as a ſign to know whether they have been turned by the hen, or no. But, as I ſaid before, we muſt remember, that the largeſt common poultry-hens be prepared for that purpoſe; which, if they be of a middling ſize, ought not to be put to ſit on more than three pea-hen's eggs, and ſix of her own kind: then, after ſhe has hatched the young ones, thoſe

of the common poultry-kind ought to be transferred to another nurſe; and thoſe of the peacock-kind, which ſhall be hatched from time to time, gathered to one nurſe, till a flock, conſiſting of twenty-five heads, be made up.

But, when the young ones are hatched, in like manner as the chickens of the common poultry-kind, let them not be removed the firſt day: the next day let them be transferred into a coop, with their nurſe that is to educate them; and the firſt days let them be nouriſhed with barley-meal beſprinkled with wine, as alſo with boiled pottage or gruel of any kind of corn, and cooled. Then, after a few days, to this food muſt be added *Tarentinian* leek, cut very ſmall, and ſoft cheeſe, out of which the whey has been ſqueezed with great force; for it is manifeſt, that whey is hurtful to the pullets. Locuſts alſo, when their feet are taken from them, are reckoned uſeful for nouriſhing thoſe little ones; and they ought to be fed with them till the ſixth month: afterwards it is ſufficient to give them barley by hand.

But after the thirty-fifth day that they are hatched, they may be ſafely enough led out into the fields, and the flock follows the clucking hen, as if ſhe were their mother. She is ſhut up in a cage, and carried out to the fields by their Feeder; and the hen being let out, is ſecured with a long line tied to her foot, and the young ones fly up and down round her: and, when they are fed to ſatiety, they are brought back to the manor-houſe, following, as I ſaid, the cluckings of their nurſe. But authors are well enough agreed, that other hens, which bring up chickens of their own kind, ought not to be fed in the ſame place; for, after they have ſeen the peacock-offſpring, they ceaſe to love their own chickens, and leave them before they are grown up, hating them indeed, becauſe they are not equal to the peacock either in bigneſs, or in beauty. The ſame diſeaſes, which uſe to hurt the common poultry-kind, infeſt theſe fowls: but no other remedies are given them, than thoſe which are applied to the common poultry-kind; for the pip and crudities, and if there are any other peſts, are checked by the ſame remedies which we have already propoſed. Then, when they are above ſeven months old, they ought to be ſhut up in the aviary with the reſt, to take their night's reſt. But care muſt be taken, that they do not abide upon the ground; for ſuch of them as uſe to lie down ſo, ought to be taken up, and placed upon the poles, leſt they ſuffer by the cold.

CHAP.

CHAP. XII.

Of the Bringing up of Numidian *and Ruſtic Hens.*

THE way of bringing up *Numidian* hens, is almoſt the ſame with that of peacocks. But wild or wood hens, which are called ruſtic, do not breed when in bondage: and therefore we give no directions concerning them, but that food be given them to ſatiety, that they may be the fitter for feaſts, and delicate entertainments.

CHAP. XIII.

Of Fowls which the Greeks *call* ἀμφίβια, (amphibious) *and the* Latins, duplicis vitæ (*of a double Life*).

I Come now to thoſe fowls which the *Greeks* call ἀμφίβια, (*amphibious*) becauſe they not only ſeek for food upon the dry land, but in the water alſo: and they accuſtom themſelves not more to the dry ground, than to the lake. Of this kind the gooſe eſpecially is acceptable to people that live in the country; becauſe it does not require the greateſt attendance and care, and keeps a better watch than a dog: for, by their cackling, they diſcover him that lies in wait to ſurpriſe you, as hiſtory alſo has informed us, in the ſiege of the Capitol, when, at the arrival of the *Gauls*, they made a loud noiſe, when the dogs were ſilent.

But this fowl cannot be kept every-where, as *Celſus* judges very truly, who thus ſpeaks: The gooſe is not eaſily ſuſtained either without water, or without much graſs; nor is it profitable in ſuch places as are ſown or planted, becauſe it plucks whatever tender or young thing it can reach; but, where-ever there is a river, or a lake, and plenty of graſs, as alſo corn-fields hard-by, there this kind of fowl muſt be nouriſhed. This we alſo adviſe you to do; not becauſe it is of any great fruit or advantage, but becauſe it is of very little burden or trouble: nevertheleſs, out of itſelf it both produces goſlings, and yields feathers; which you muſt not gather as you do wool from your ſheep, only once a year, but you may pluck them twice a year, in the ſpring and autumn; and, indeed, for theſe reaſons, if the condition of the place

place will allow it, you muſt bring up a few at leaſt, and to each male aſſign three females; for, becauſe of their heavineſs, they cannot couple with more. As alſo you muſt make gooſe-pens for them in retired corners, within the poultry-yard, that they may be protected and ſheltered, and lodge, and lie down, and lay their eggs, and hatch them, therein.

CHAP. XIV.

Of the Bringing up of Geeſe, and making a Gooſe-pen for keeping and feeding them.

LET thoſe, who are deſirous to have flocks of ſwimming fowls in their poſſeſſion, conſtitute proper places for feeding and keeping them, which then will turn to account, and anſwer expectation, if they be duly ordered in ſuch a manner as this: A large yard is incloſed, remote from all other cattle, ſurrounded with a wall nine feet high, and with porticos, ſo that the Keeper's cell may be in one part of it; then under the porticos are built ſquare gooſe-pens, with rubbiſh, or any rough materials for building, or with ſmall bricks alſo; it is ſufficient, that each of them have three feet every way, and each of them an entry, ſecured with ſtrong little doors; becauſe they ought to be carefully ſhut up during the time they are laying their eggs, and hatching. Then, if, without the manor-houſe, not far from the building, there be a pond or pool of ſtanding water, or a river, let no other water be ſought for; if not, let a lake or pond be made by hand, that they may be ſuch as the fowls can dive in: for they can no more live conveniently without this ſhelter and defence, than they can do without that upon dry land.

Let marſhy land alſo, but ſuch as is graſſy, be deſtinated for them; and let other ſorts of food be ſown for them, ſuch as tares, trefoil, fenugreek, but eſpecially a kind of endive, which the *Greeks* call *ſerin* (1); the ſeeds of lettice alſo ought, above all things, to be ſown for this uſe, becauſe it is both an exceeding ſoft and tender pot-herb, and very

(1) *Genus intubi quod* Σέριν *Græci appellant.* In *Dioſcorides* you read it alſo Σιρίδα in the Accuſative: he diſtinguiſhes it into wild and tame. See *Matthiolus in Dioſcoridem* his deſcription of it, where he mentions the ſeveral ſorts, both of the wild and tame; and ſays, that the wild is the ſame with what they call *cichorium ſylveſtre*, and *picris*, becauſe of its bitterneſs.

much

much ſought after, and much liked, by theſe fowls; as alſo very uſeful food for their young ones. When you have prepared all theſe things, you muſt take care, that males and females, of the largeſt bodies, and of a white colour, be choſen: for there is another kind of divers colours, which, from being wild, is ſoftened and made tame. That kind is neither equally fruitful, nor ſo valuable; for which reaſon it muſt not be brought up at all.

The fitteſt time for putting geeſe to couple is after the ſhorteſt day of winter is paſt; and, afterwards, for laying their eggs, and brooding, from the calends of *February* or *March* till the ſolſtice, which falls in the latter part of the month of *June*. They couple, not as thoſe other fowls of which we have already ſpoken, reſting upon the ground; for, for the moſt part, they do that in a river, or in ponds: and each of them lays eggs three times in a year, if they are kept from hatching their own eggs; which is more expedient, than when they themſelves ſit upon them in order to hatch them; for they are both better nurſed by common hens, and a much greater flock of them is made up.

But, the firſt time of their laying, they lay five eggs; the ſecond, four; and the laſt, three: which laſt laying ſome people allow the dams themſelves to bring up, becauſe the reſt of the year they will ceaſe from laying any more eggs. The females muſt not at all be allowed to lay their eggs without the incloſure; but, when they ſhall be ſeen ſeeking for a place to ſettle in, you muſt ſtop them, and feel if they are with egg: for, if the time of their laying approaches, you may with your finger touch their eggs, which are near the entry of their genital parts. Wherefore they ought to be brought to their gooſe-pen, and ſhut up, that they may lay their eggs: and it is ſufficient to have done this once to each of them, becauſe every one of them runs again to the ſame place where ſhe firſt laid her egg. But, at the laſt time of their laying, when we have a mind, that they themſelves ſhould ſit on their own eggs, the eggs of every one of them in particular muſt be marked, that ſo they may be put under her that laid them; becauſe they deny, that one gooſe can hatch the eggs of another, unleſs ſhe alſo have her own eggs put under her. But five eggs of this kind, as thoſe of the pea-hen, are the moſt that are ſet under common hens, and three the feweſt: but, under the geeſe themſelves, the feweſt are vii, and xv the moſt.

But great care muſt be taken, that when nettle-roots are laid under the eggs, by which remedy, as it were, they are cured, they may not hurt the goſlings, when they are come out of the ſhells; for nettles

nettles kill them, if they prick them when they are very young. But thirty days are neceſſary for forming and hatching the young ones, when the weather is cold; for in mild, warm weather xxv days are ſufficient: but, more frequently, the goſling comes out of the ſhell the thirtieth day. And, while it is very little, it is ſhut up and fed with its dam in the gooſe-pen, during the firſt ten days: afterwards, when fair weather permits, it is carried out into the meadows and ponds; and care muſt be taken, that it be neither pricked with the prickles of nettles, nor ſent out to paſture when it is hungry; but be ſatiated, before it go out, with endive, or lettice-leaves cut in pieces. For if, while it is as yet not very ſtrong, and ſtanding in need of food, it come out to the paſture, it ſtruggles ſo obſtinately with ſhrubs, or the more ſolid herbs, that it choaks itſelf, or disjoints its neck. It is right to give it millet alſo, or wheat mixed with water: and, after it has gathered a little ſtrength, it is driven to a flock of goſlings of the ſame age with itſelf, and nouriſhed with barley: which it is not improper to give alſo to ſuch geeſe as are laying eggs, or brooding.

But it is not expedient to aſſign more than twenty goſlings to each gooſe-pen; nor, on the other hand, muſt they be ſhut up at all with ſuch as are older than themſelves, becauſe the ſtronger kills the weaker. The cells, wherein they lie, muſt be exceeding dry; and they muſt have ſtraw ſpread under them: or, if this cannot be had, hay alſo is moſt acceptable to them. As to the reſt, the very ſame things muſt be obſerved with reſpect to them, as to the young brood of other kinds of fowls, that neither a ſerpent, nor a viper, nor cats, nor a weaſel alſo, may be allowed to breathe upon them; which peſts reduce them, while they are very young, almoſt to utter deſtruction. There are ſome who ſet ſoaked barley by ſuch as are ſitting on their eggs, and do not ſuffer thoſe that are brooding to leave their neſts frequently. Some alſo give them green creſſes with water, cut very ſmall; and this is a moſt agreeable food to them. Afterwards, when they are four months old, all the largeſt of them are deſtinated for cramming, becauſe their tender age eſpecially is reckoned the fitteſt for this purpoſe: and theſe fowls are eaſily fattened; for, beſides dried barley-meal ſoaked in water, and wheat-flour three times a day, it is not neceſſary to give them any other thing, provided they have liberty to drink abundantly, but are not allowed to wander up and down, and that they be kept in a warm and dark place: which things contribute very much to breed fat. In this manner they grow fat in two months; and, by ſuch management, even the tendereſt brood is often brought, in forty days, to be exceeding fat and plump.

CHAP.

CHAP. XV.

Of Ducks, Teals, and the like.

A Place for feeding ducks requires the like care, but greater expences. For ducks, teals, pocards, *phalerides* (1), and ſuch-like fowls, which ſearch all the holes and corners of ponds and pools of ſtanding water and marſhes, are put under confinement, and fed in a cloſe place. An even, level place is choſen *for this purpoſe*, and fenced round with a wall fifteen feet high: then it is covered with grates or croſs-bars placed over it, or with nets with large maſhes, that neither the fowls within the houſe may have liberty to fly out, nor eagles and hawks to fly into it.

But this whole wall muſt be ſmoothed with plaſter, both without and within, that ſo neither a cat, nor a ferret, may creep over it. Then, in the middle part of this duckery, a lake is digged two feet deep, and as much ſpace is aſſigned to the length and breadth thereof, as the condition of the place will permit. The edges or ſides of the pool are all laid with *Signinian* work, (plaſter of *Paris*) leſt they be conſumed with the violence of the waving and overflowing of the water, which ought always to flow and be in motion between them: and they muſt not be raiſed and formed into ſteps, but gradually ſubſide with a gentle deſcent, that there may be an eaſy deſcent into the water as from a ſhore. But the bottom of the pond or pool, as far almoſt as two thirds of the whole dimenſion, muſt be ſtrongly paved all round with ſtones well driven in, and plaſter, that it may not throw up graſs and weeds, but preſerve the ſurface of the water pure for ſuch fowls as ſwim in it.

Moreover, the middle part of it ought to be of earth, that it may be planted with *Egyptian* beans, and other green things, which commonly grow in water, which darken, and furniſh a ſhade, for the places where the fowls retire and ſhelter themſelves. For there are ſome of them which delight to abide either in little woods of tamariſk-trees, or in thickets of ſhrubs and ruſhes: nevertheleſs, let not the

(1) *Phalerides. Plin. lib.* 3. *cap.* 48. ſays, that in *Seleucia* of the *Parthians*, and in *Aſia*, theſe are the moſt commended of any water-fowls whatſoever. Father *Hardouin*, in his note upon this place, ſays, that they are frequent in the country about *Soiſſons* and *Beauvois* in *France*. It is a beautiful fowl, which delights in ponds and lakes: but whether there is any ſuch fowl in *England*, or by what name it is called, I know not.

whole place, for this reaſon, be taken up with little woods; but, as I ſaid, let it be free and open all round, that the fowls, when a clear, warm, ſun-ſhining day makes them leap and ſkip for joy, may, without any hindrance, ſtrive together which of them can ſwim the ſwifteſt. For, as they deſire to be where they have holes to creep into, and where they may lie in ambuſh for animals that live in rivers, and lurk and hide themſelves from them; ſo they are offended, if there are not free, open ſpaces, where they may go freely up and down.

Then, without the lake, let the banks be covered with graſs for twenty feet on all ſides; and behind this extent of ground, about the wall, let there be places for them to lodge in, of a foot ſquare, built with ſtone, and ſmoothed with plaiſter, in which the fowls may make their neſts; and let them be covered with box and myrtle-ſhrubs planted among them, which muſt not exceed the height of the wall. Then let a little chanel be built all along, and ſunk under-ground, through which their food may daily run down mixed with the water; for in this manner does this kind of fowl gather its food. Terreſtrial food alſo of puls, as millet, panic, and barley alſo, is very acceptable to them: but they alſo give them maſt, and huſks, and kernels of grapes, where there is plenty of them. But, of aquatile food, they give them crab-fiſh, if they have them in plenty, or ſmall river pilchards, or anchoves of little value; or if there be any other river animals of a ſmall growth.

They obſerve the ſame times of coupling, in *March* and the following month, as other wild fowls do; during which, ſtalks of herbs, ſprays, and ſprigs, muſt be ſcattered here-and-there in the aviaries, that the fowls may gather them, and build their neſts therewith. But it is a very old practice, and exceeding proper, that when one has a mind to conſtitute and form a duckery, he ſhould gather the eggs of the foreſaid fowls about the marſhes, wherein, for the moſt part, they lay them, and breed, and ſet them under common poultry-hens; for their young ones, being thus hatched and brought up, lay aſide their wild diſpoſition, and will certainly breed when they are ſhut up in aviaries: for, if you would put into cuſtody, and ſhut up, fowls that are newly taken, which have been accuſtomed to live at full liberty, they delay laying their eggs in their ſervitude. But enough has been ſaid of the tutelage of ſwimming fowls.

CHAP.

CHAP. XVI.

Of Fiſh-ponds, and of feeding of Fiſhes.

BUT, while we are making mention of aquatile animals, we ſhall come opportunely to the care and management of fiſhes. For tho' I think, that the gain, redounding from them, is moſt unſuitable and alien to Huſbandmen, (for what can I imagine ſo contrary as terreſtrial and fluid, or dry land and water?) nevertheleſs, I ſhall not omit it. For our anceſtors took great delight in, and applied themſelves much to, theſe things, even to ſuch a degree, that they ſhut up ſalt-water fiſhes alſo in freſh waters, and nouriſhed the mullet, and the ſcare, with the ſame care as the ſea-lamprey, or ſea-pike, are now educated. For that antient, ruſtic progeny of *Romulus* and *Numa* valued themſelves mightily upon this, and thought it a great matter, that, if a rural life were compared with a city life, it did not labour under the want of, or come ſhort in, any part of riches or wealth whatſoever. Wherefore, they not only ſtored the fiſh-ponds, which they themſelves had built, with great numbers of fiſhes, but alſo filled the lakes, which nature had formed, with ſpawn, or young fiſhes, brought from the ſea. Hence it was, that the lakes of *Velino* (1), *Bracciano* (2), *Bolſeno* (3), and *Vico* (4) alſo, did procreate ſea-jacks and gilt-heads; and if there be any other kinds of fiſhes which can endure freſh water.

Afterwards the following age aboliſhed that care; and the daintineſs, magnificence, and ſumptuouſneſs of the rich, have ſhut up the very ſeas, and *Neptune* himſelf alſo; and now, with the hiſtory of our grandfathers, the action and ſaying of *Marcius Philippus* (5) is

(1) *Lacus Velinus*, a lake in *Umbria*, upon the borders of *Sabina* in *Italy*; it is now called *Lago de Pie di Luco*. It lies between *Reati*, a Town in *Sabina*, and *Tarni*, a town in *Umbria*: the river *Velino* runs through it.

(2) *Lacus Sabatinus*, now called the lake of *Bracciano*, from the adjacent town of that name.

(3) *Lacus Vulſinienſis*, or *Vulſinienſis*; the lake of *Bolſeno*, in the duchy of *Caſtro* in *Hetruria* in *Italy*, almoſt round, and thirty miles in circumference. It has other names from the places adjacent, which it is needleſs to trouble the reader with.

(4) *Lacus Ciminus*, now called *Lago di Vico*, between *Viterbo* and *Ronciglione*. It may as properly be called the lake of *Viterbo*, as *mons Ciminus* is called the hill of *Viterbo*.

(5) *Marcius Philippus*. This ſtory our author has taken from *Varro*, *lib.* iii. *cap.* 3. who ſays, Did not *Philippus*, when he turned aſide to lodge with his friend *Immidius* at *Caſſinum*, and at ſupper had taſted of a beautiful pike, which his friend had ſet before him,

is publiſhed every-where, and is in every body's mouth (as mighty pleaſant and polite, which was, indeed, exceeding luxurious): for at a certain time, when he was at ſupper in his friend's houſe, with whom he lodged, at *Caſſinum*, and had taſted of a pike, out of the neighbouring river, which was ſet before him, and had ſpitten it out, he followed the impudent and naughty action with a jeſt, *May I periſh*, ſaid he, *if I did not think it was a fiſh!* Therefore, this falſe oath has put many upon more nice and uncommon contrivances to gratify their gluttonous appetite, and taught delicate, wiſe, and learned palates to loath and make no account of the river-pike, except that which the adverſe ſtream of the *Tiber* had wearied. Therefore *Terentius Varro* ſays, 'That, in this age, there is not a vain, paltry, 'ſorry fellow, or a ſtage-player (6), who will not ſay, That it is no 'matter to him whether his fiſh-pond be well ſtored with this kind 'of fiſh, or with frogs; and that, in his opinion, there is no dif-'ference between them.' Nevertheleſs, in thoſe very times, wherein *Varro* gives an account of this luxury, *Cato*'s ſeverity was exceedingly commended, who, notwithſtanding, when he himſelf was *Lucullus*'s guardian (7), ſold his pupil's fiſh-ponds for the ſum of four hundred thouſand *ſeſtertii*. For then the dainties of taverns, and of houſes of riotous entertainments, were in great vogue, and much ſought after, when fiſh-ponds were brought from the ſea; and they who took great delight in them, and made them their chief ſtudy, rejoiced,

him, and had ſpit it out, ſay, *May I periſh, if I did not take it to be a fiſh! Caſſinum*, now called *Monte Caſſino*. It was antiently a town of the *Volſci* in *Latium*, near the borders of *Campania*; now it is in the province of the *Terra di Lavoro*, in the kingdom of *Naples*. It is very uncertain who this *Marcius Philippus* was; probably he was one of the *Marcian* family, which was very noble and antient, being deſcended from *Ancus Marcius*, who was once king of *Rome*. By *Varro*'s manner of relating the ſtory, it ſeems to have happened in *his own time*. It ſeems they only valued ſuch pikes as were taken in a certain place of the river *Tiber*.

(6) *Rhinton*. This was probably the name of ſome famous actor or buffoon; and *Varro* perhaps had in his view, and applied it to, *Æſop* the ſtage-player, who was known to him; and whoſe extravagant luxury and profuſion *Pliny*, in his *natural hiſtory*, and ſeveral other authors, take particular notice of, and condemn.

(7) *Tutor Luculli grandi ære ſeſtertium millium quadringenterum pupilli ſui piſcinas venditabat. Cato*, who periſhed at *Utica*, was guardian to this *Lucullus*; and our author ſays, he ſold his fiſh-ponds for 400000 ſeſtertii, which, in *Engliſh* money, amount only to 3229 *l.* 3 *s.* 4 *d.* But *Pliny* ſays, that they were ſold for four millions of ſeſtertii, which amount, in *Engliſh* money, to 32,291 *l.* 13 *s.* 4 *d.* ſo that there ſeems to be an error in the text of *Columella*; for the ſum mentioned by *Pliny* ſeems much more probable, conſidering the vaſt profuſeneſs of *L. Lucullus*, and the great ſums he expended in making fiſh-ponds near *Naples*, and the prevailing humour of the great men at *Rome* about that time, who ſpared no coſt in order to excel in the magnificence of their villas and fiſh-ponds; ſo that *Lucullus*'s fiſh-ponds muſt have ſold for much more than this ſum, as it now ſtands in our author.

and

and were glad, to be called by the names of the fiſhes they had catched. So Sergius was called *Orata* (8); and Licinius, *Muræna* (9); juſt as Scipio was called *Numantinus* (10), and P. Servilius, *Iſauricus* (11), from the nations they had before conquered.

But becauſe the manners of this age are become ſo callous, that theſe things are reckoned not as cuſtomary and common amuſements, but as highly commendable and honeſt ſtudies; we alſo, leſt we ſhould ſeem to be late cenſurers of ſo many ages now paſt, ſhall explain and point out this kind of gain alſo, that a maſter of a family may make at his villa. Let the man who has purchaſed iſlands, or lands contiguous to the ſea, and cannot receive any fruits from his ground, becauſe of the poorneſs of the ſoil, which, for the moſt part, is the caſe near the ſea-ſhore, raiſe to himſelf a revenue from the ſea. But it is, as it were, the beginning of this affair, carefully to view and conſider the nature of the place, where you reſolve to make and conſtitute your fiſh-ponds: for all kinds of fiſhes (12) cannot be had in all ſhores. A ſlimy, muddy region educates the flat fiſh, as the ſoal, the turbot, the plaiſe: the ſame alſo is exceeding proper for conchyls (13), burrets, oyſters, and others of the purple kind:

(8) *Sergius Orata*, as *Pliny* ſays, *lib.* ix. 52. was the firſt who invented oyſter-beds at *Baia* near *Naples*. He was, as ſome think, called *Aurata*, becauſe he delighted much in a ſort of fiſh called *aurata*, which, as *Feſtus* ſays, were of the colour of gold: he ſays, that the common people called *orum*, what ought properly to be called *aurum*, which is the reaſon why he was called *orata*.

(9) *Licinius Muræna*, as *Pliny* ſays, *lib.* ix. 55. was the firſt who invented ponds for many ſorts of fiſhes; and from one ſort of them, which he delighted moſt in, had the ſurname of *Muræna*: many of the quality followed his example, as *Philippus Hortenſius*, *Lucullus*, and others.

(10) *Scipio* was called *Numantinus*, from his taking *Numantium* in *Spain*, after a long and tedious ſiege: but he got nothing but the bare walls; for the people choſe rather to burn themſelves, and all that they had, than ſubmit to him, and live with the loſs of their precious liberty.

(11) *P. Servilius* was called *Iſauricus* from his conquering *Iſauria*, a country of *Leſſer Aſia*, on the ſouth of *Galatia*, and bordering upon *Piſidia*.

(12) It is not eaſy to determine by what *Engliſh*, or other modern names, ſeveral of the fiſhes, mentioned by our author, ought to be rendered: authors, who have written upon this ſubject, are not at all agreed upon this particular; many of them are not known in our ſeas, ſo that it cannot be expected, that they have any names in our language. Both the *Greeks* and *Romans* called ſeveral fiſhes by the names of terreſtrial animals, and other things to which they thought they bore ſome reſemblance, either in their ſhape, colour, or ſome other remarkable quality; and theſe I have rendered accordingly: and of others I have retained the original names, as has been often done by others who have had occaſion to mention them.

(13) *Conchylia* ſometimes ſignify ſmall ſhell-fiſhes of the purple kind, which yielded a kind of juice or blood, wherewith they dyed purple. But *Pliny* frequently makes uſe of

kind: as alſo of the ſcallop kind, the pectuncles (14), and the ſea-acorns (15), or the ſphondyli (16): but ſandy gulphs afford not very bad food indeed to flat fiſhes; but they feed better ſuch as are bred in the deep ſea, as gilt-heads, and ſea-ruffs, and the *Carthaginian*, and our own *Italian* ombers or ſhade-fiſhes; but they are not ſo proper for conchyls, or ſhell-fiſhes of the purple kind. Moreover, a rocky ſea nouriſhes very well fiſhes of its own name, which, doubtleſs, are called *ſaxatile*, or rock-fiſhes, becauſe they harbour and lodge in rocks, as the merle, the ſea-thruſh, and the ſea-bream (17). And it is neceſſary to know the differences of ſeas alſo, as well as of ſhores, leſt fiſhes, bred in different ſeas, deceive us: for all fiſhes cannot ſubſiſt in every ſea, as the *helops* (18), which is fed in the *Pamphylian* deep, and in no other whatſoever: as the *dory* in the *Atlantic* ſea, which alſo, in our municipal city of *Cadiz*, is numbered with the moſt generous fiſhes, and, by antient cuſtom, we call it *zeus*. As the *ſcarus* (19), or cud-fiſh, alſo, which, in great numbers,

of the word *conchylium* to ſignify the colour itſelf, and always diſtinguiſhes it from the beautiful *Tyrian* or deep-purple colour, which was ſo highly eſteemed by the antient *Romans*; and, for the moſt part, the *murex*, which ſome call a *burret*, was only uſed for this valuable colour, and was moſt ſought after. The *conchylium* was much paler, and more diluted, than the *purpura*, which had abundantly more of the juice or blood of the fiſh than the other: the matter uſed for both theſe colours might be the ſame, but differed in the way of tempering it; for that for the rich purple was only mixed with water, whereas the other was mixed with urine, which gave the *conchyliatæ veſtes* a diſagreeable ſmell, and made them leſs eſteemed; and, according to the mixture, they had more or leſs of the purple, but all had ſomething of a tendency to blue.

(14) *Pectunculus*, the diminutive of *pecten*, which is a large kind of ſcollop. They have a double ſhell chanelled; and are ſo called, becauſe their ſhells are chanelled, and formed in the faſhion of a comb.

(15) *Balanus*. It is ſo called, becauſe it is ſhaped like an acorn.

(16) *Sphondylus*, or rather *ſpondylus*, as it is in *Pliny*, a kind of ſhell-fiſh; probably ſo called, becauſe it bears ſome reſemblance to a vertebra of the neck, and is what *Athenæus* calls τράχηλον. *Pliny* ſometimes calls by this name that callous and white part of an oyſter, or other ſhell-fiſhes, which ſticks to the ſhell.

(17) *Melanurus*. Some call this a *bream*: it has its name from the blackneſs of its tail.

(18) *Helops*. *Plin. nat. hiſt. lib.* xxxii. *c.* 11. makes mention of this fiſh from *Ovid*, who had ſeen it in *Pontus*, and ſays, that it was not known in the *Mediterranean* ſea; and that many preferred it to all other fiſhes for its exquiſite taſte.

(19) *Scarus*. *Pliny* ſays, that this is the only fiſh that is ſaid to chew its cud; and that it feeds on herbs, and not on other fiſhes; and is very frequent in the *Carpathian* ſea: that, of its own accord, it never paſſes the promontory *Lectos* of *Troas*; but that, in the reign of *Tiberius Claudius*, a certain admiral diſſeminated them on the coaſt between *Oſtium* and *Campania*; and that for five years, when any of them were taken, they were thrown again into the ſea; and that afterwards there were abundance of them taken

bers, comes out of the coaſts of all *Aſia* and *Greece* as far as *Sicily*, but has never ſwum out of them into the *Ligurian* ſea, nor by *Gaul* into the *Hiberian* ſea: therefore, ſuppoſe they were taken and brought into our fiſh-ponds, they could not be long in our poſſeſſion. Of all the rare and valuable fiſhes, the ſea-lamprey alone, tho' it is originally a native of the *Tarſian* ſea, and of the *Carpathian*, which is the utmoſt ſea, endures a foreign ſea, whatever frith it is a gueſt in. But now we muſt ſpeak of the ſituation of fiſh-ponds.

CHAP. XVII.

Of the Situation of a Fiſh-pond.

WE are of opinion, that that pond is incomparably the beſt, which is ſo ſituated, that the ſucceeding wave of the ſea may remove the former, and not ſuffer the old one to remain within the incloſure: for that pond is the moſt like the ſea, which, being agitated by the winds, is continually renewed, and cannot grow warm, becauſe it conſtantly revolves the cold wave from the bottom to the uppermoſt part. But this pond is either cut out of a rock, of which it is very rare to find the conveniency; or it is built with *Signinian* work, or plaſter of *Paris*, upon the ſea-ſhore: but, whatever way it be built, if it be exceeding cold by the gulph flowing conſtantly into it, it ought to have caves hard by the bottom, ſome of them ſingle without windings, and ſtraight, where the ſcaly flocks may retire; others of them crooked and winding, but not too ſpacious, in which the ſea-lampreys may lurk: although ſome do not think it proper, that they ſhould be mixed with fiſhes of a different ſort, becauſe, if they are ſeized with madneſs, which this kind is liable to, in the ſame manner as dogs are, they perſecute the ſcaly fiſhes moſt cruelly, and devour and eat a great many of them.

And, if the nature of the place will allow it, it is proper that paſſages be made for the water on every ſide of the fiſh-pond: for the old water is more eaſily removed, when, by whatever part the wave preſſes, there is an open outlet for it through the oppoſite ſide. But

taken upon the coaſt of *Italy*; ſee *lib.* ix. *c.* 17. The *Carpathian* ſea, where they abound moſt, has its name from the iſland *Carpathus* between *Crete* and *Rhodes*, and is one of the *Sporades*.

we

we are of opinion, that theſe paſſages ſhould be made along the lower part of the incloſure, if the ſituation of the place will allow it, that a plumbet, being placed in the bottom of the fiſh-pond, may ſhew, that the ſurface of the ſea is ſeven feet higher; for this meaſure of the depth of the gulph is abundantly ſufficient for pond-fiſhes: nor is there any doubt, but, by how much deeper the ſea is, which the water comes from, by ſo much the colder it is, which is moſt proper for ſwimming fiſhes. But if the place, where we adviſe you to build the fiſh-pond, be upon an equal level with the ſurface of the ſea, let it be digged to the depth of nine feet; and below, two feet from the uppermoſt part, let a ſmall canal be laid all along for a gentle current of water; and care muſt be taken, that it come in very plentifully, becauſe that quantity of water, which lies below the level of the ſea, is not otherwiſe ſqueezed out, but by a greater force of recent ſea-water ruſhing in upon it.

Many think, that, in theſe kinds of ponds, there ought to be built long places of retirement for the fiſhes, and winding caves in the ſides of the ſame, that ſo they may have the darker lurking places when they are very hot. But, if recent ſea-water does not always paſs freely through the pond, it would be hurtful to them to do this: for receptacles of this ſort do neither eaſily admit new waters, nor emit the old but with great difficulty; and rotten water does more hurt, than the darkneſs *of thoſe places* does good. Nevertheleſs, there ought to be like as it were hollow cells made in the walls, for protecting them when they fly from the heat of the ſun; and which, notwithſtanding, may eaſily let out the water which they have received: but it is neceſſary to remember, that brazen croſs-bars, or lattices, with ſmall holes, be faſtened before the canals through which the water flows, that the fiſhes may be hindered from making their eſcape. But, if the extent of the place will allow it, it will not at all be amiſs to place rocks from the ſea-ſhore, eſpecially ſuch as are covered with ſea-weeds, in ſeveral places of the pond; and, as much as the wit of man can contrive, to repreſent the appearance of a real ſea, that the confined may be as little ſenſible of their impriſonment as poſſible.

Having in this manner prepared ſtables for the aquatile cattle, we muſt bring them in to them. And, let it be a principal point with us to remember alſo, in all river-buſineſs, and water-affairs whatſoever, the direction given relating to what is done upon dry land:

'Conſider well what ev'ry place will bear.'

For

For we cannot, if we had a mind to it, feed a multitude of barbels in a fiſh-pond, as we have ſometimes ſeen in the ſea; foraſmuch as it is a moſt delicate, tender kind of fiſh, and ſuffers bondage with great indignation; therefore, of many thouſands, rarely one or two of them endure confinement: but, on the other hand, we frequently obſerve, within incloſures, ſhoals of ſluggiſh ſea-mullets, and rapacious ſea-wolves, which commonly breed in the deep ſea. Wherefore, as I propoſed, let us conſider the quality of our ſea-ſhore, whether we avoid rocks, or if we approve of them.

We muſt ſhut up in our ponds the ſeveral ſorts of ſea-thruſhes, merlins, and the greedy ſea-weaſels; as alſo ſea-wolves, or ſea-jacks, that have no ſpots, (for there are ſome of them of divers colours) as alſo floating lampreys, which are very much commended; and if there be any others of the *ſaxatile* or rock character, which bear a very great price; for it profiteth nothing indeed to catch, much leſs to nouriſh, ſuch as bear a low price: theſe ſame kinds alſo may be kept in ponds upon a ſandy ſhore: for ſuch ponds as grow dirty with ſlime and mud, as I ſaid before, are more proper for conchyls, and for animals that lie.

Nor is a pond, for the reception of ſuch fiſhes as lie, to have the ſame poſition: but the ſame food is given both to erect and to proſtrate fiſhes: for, for ſoals and turbuts, and ſuch-like animals, they ſink a pond two feet deep, in that part of the ſhore which is never left deſtitute of water by the ebbing of the ſea; then they faſten very cloſe croſs-bars upon the brim or ſide of the pond, which may always appear above water, even when the tide ſwells, and riſes to its full height. Afterwards they caſt up moles before it, and round the whole circumference of it, and ſo as they may encompaſs it, and contain it in their boſom, and exceed the dimenſions of the pond: for ſo the raging and violence of the ſea is broken by the interpoſition of the bank; and the fiſh, keeping in a quiet and calm place, is not diſturbed and driven out of its habitations, nor is the pond itſelf filled up with a heap of ſea-weeds, which the raging of the ſea throws up in ſtormy weather. But in ſome places, the moles muſt be cut through in the manner of a *Mæander* (1), with ſmall but ſtrait narrow paſſages, which may let the ſea paſs through without a wave, in the moſt ſtormy winter-weather whatſoever.

(1) *Mæander*, a river in *Phrygia*, which runs through *Caria* and *Ionia*, full of various windings and turnings: hence any place, with many turnings and windings, is called by that name.

Here the food of fiſhes, that lie proſtrate, ought to be ſofter than that of rock-fiſh; for, becauſe they want teeth, they either lick their victuals, or ſwallow them whole; for, indeed, they cannot chew them: therefore it is proper, that rotten or damaged pilchards ſhould be given them; and ſardels conſumed with ſalt, and rotten ſardines, as alſo the gills of *ſcares*, or whatever entrails the young tunny and the ſea-lizzard have; as alſo the ventricles of the mackrel, the carcharus (2), and the diſtaff-fiſh (3); and, that I may not mention every thing in particular, all the garbage of ſalted fiſh, which are ſwept out of fiſhmongers ſhops. But we have mentioned ſeveral kinds of them, not becauſe all of them come forth of all ſea-ſhores, but that we may give them ſome of thoſe which we ſhall have in our power to give.

Of green fruit of the apple-kind, the fig laid open is very proper for them; and nuts alſo, broken with your fingers, muſt be given them; as alſo the ſoft ſorb-apple boiled, and ſuch victuals as are next to ſuch as are ſupable, as new cheeſe or curds out of the milk-pail, if the condition of the place, or the plenty and cheapneſs of the milk, will permit it. But there is no food that is equally proper and convenient for them, as the foreſaid ſalted proviſion taken out of the brine, becauſe they have a ſtrong ſmell: for every fiſh that lies, ſearches for, and finds out, its food more with its noſe than with its eyes; for, while it conſtantly lies upon its back, it looks more aloft, and does not eaſily ſee ſuch things as are upon a level with itſelf, upon the right and left: therefore, when ſalted fiſh is thrown to them, they follow their ſmell, and come to their victuals.

But other fiſhes, that either live among rocks, or in the open ſea, are well enough nouriſhed with theſe ſalt things, but better with ſuch as are freſh: for the ſmall pilchard or anchove newly taken, and the crevice, and the ſmall gudgeon, and, in a word, every other fiſh that is of a minute growth, nouriſhes the greater. Nevertheleſs, if, at any time, the boiſterouſneſs of the winter does not ſuffer this kind of food to be given them, either morſels of coarſe bread, or, if there be any apples of this ſeaſon, they are cut ſmall, and given to them. Indeed the dry fig is always thrown to them, and is excellent, if it be large, as is that of the regions of *Bætica* and *Numidia*. But that ought never to be practiſed which many do, who give them nothing

(2) *Carcharus*. I do not find this among the many fiſhes mentioned by *Pliny*, and probably this is not the true reading.

(3) *Elacata*. This fiſh has its name from its reſembling a diſtaff. *Pliny* calls fiſhes of this ſort *Helacatenes*.

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at all, becauſe, even when they are ſhut up, they can ſupport themſelves for a long while: for, unleſs the fiſh is fattened with its owner's victuals, when it is brought to the fiſh-markets, its leanneſs declares, that it was not taken in the open ſea, but brought out of a place of confinement; for which reaſon there is a very great abatement made of the price. And, let this ſort of manor-houſe paſturing put an end to this preſent diſcourſe, leſt the reader be wearied with the immoderate length of the volume. But, in the following book, we ſhall return to the care and management of wild-cattle, and to the culture of bees.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK NINTH.

The PREFACE.

I Come now to the tutelage of wild cattle, and the education of bees; which very things, *Publius Silvinus*, I may alſo very juſtly call manor-houſe paſturings: foraſmuch as antient cuſtom placed parks for young hares, and wild goats, and ſuch-like wild beaſts, hard by the manor-houſe; for the moſt part ſituated below the owner's apartments, that ſo the ſeeing of them hunted within the incloſure might both delight the eyes of him who had them in his poſſeſſion; and that they might be brought forth, as it were, out of a ſtore-houſe, when he had occaſion to make entertainments. And, even in our own memory, bees had ſeats aſſigned them, either in the walls of the manor-houſe cut into niches, or in porticos ſheltered from the weather, and in orchards. Wherefore, ſeeing there is a reaſon given of the title, which we have prefixed to this diſcourſe, let us proſecute particularly each of the things we have now propoſed.

CHAP. I.

Of making Parks, and ſhutting up wild Cattle in them.

WILD cattle, as young roe-bucks, fallow deer, as alſo the ſeveral kinds of ounces, and ſtags, and boars, ſometimes ſerve for the magnificence, and ſplendor, and pleaſures of their owners; and, at

at other times, to make gain, and increaſe their revenue: but they who ſhut up wild beaſts, in order to hunt them for their pleaſure, are ſatisfied, whatever the ſituation of the place next to the dwelling-houſe may be, with incloſing a park for their cattle, and giving them always food and water by hand. But they who are deſirous of gain, and of a revenue from them, when there is a wood near to the manor-houſe, (for it is of great importance, that it be not far from the owner's eyes) deſtinate it for the foreſaid animals, without any heſitation: and, if natural water is wanting, they either bring running water into it, or dig ponds in it, and lay them with *Signinian* work, (plaſter of *Paris*) that they may contain the rain-water that they ſhall have received.

There is ſuch an extent of wood taken in, as is ſuitable to every man's eſtate; and, if the cheapneſs of ſtone and labour give encouragement, without all manner of doubt a wall, made of rough ſtone and lime, is built round it; if otherwiſe, it is built with unburnt brick and clay. But, when neither of theſe is for the advantage of the maſter of the family, reaſon requires that it ſhould be incloſed with wooden rails; for ſo a certain kind of bars is called: and they are made of red-oak, or evergreen-oak, or of the cork-tree; for it is rare to have the conveniency of the olive-tree: in a word, whatever is more laſting under the injuries of the rains, is choſen for this uſe, according to the circumſtances of the country. And whether it be the round ſtock of a tree, or it be cloven into ſtakes, as the thickneſs of it requires, it is bored through the ſide in ſeveral places, and erected and faſtened round the whole circumference of the park, certain ſpaces intervening between each ſtake: then croſs-bars are put through the holes that are made in their ſides, which may ſhut up all paſſages for the wild beaſts to go out at.

But it is ſufficient to faſten the pales in the ground, at the diſtance of eight feet from one another, and to bind them together ſo cloſely with croſs-bars, that the wideneſs of the ſpaces between the holes may not give the cattle an opportunity to make their eſcape: and, in this manner, you may incloſe even the broadeſt countries, and tracts of mountains, as the vaſt extent of the countries in *Gaul*, and alſo of places in ſome other provinces, will bear; for there is both very great plenty of wood for making pales, and every other thing neceſſary for this purpoſe is ready at hand, and can be eaſily obtained; for the ſoil abounds in frequent ſprings, which is exceeding wholſome for the foreſaid kinds of wild beaſts: and it alſo furniſhes forage for them very liberally of its own accord. And ſuch foreſts are chiefly

chiefly choſen, which abound both in fruits of the ground, and in fruits of trees; for as they have need of all ſorts of graſs, ſo likewiſe of oak-maſt: and thoſe foreſts are moſt commended, which are the moſt fertile of acorns, both of the common- and evergreen-oak, likewiſe of the cerrus-oak, as alſo of the arbute- or ſtrawberry-tree, and other wild apples, which we carefully treated of, when we diſcourſed of ſuch cattle as are kept in yards about the manor-houſe; for the forage of wild cattle is almoſt the ſame with that of tame.

Nevertheleſs, a diligent maſter of a family ought not to be contented with thoſe ſorts of food, which the earth produces naturally of its own accord; but, at ſuch times of the year, wherein the woods want ſuſtenance for them, he ought to relieve the confined with the fruits of the earth, which he gathered in harveſt, and laid up in his ſtore-houſes, and nouriſh them with barley- or wheat-meal, or beans, and moſt of all with huſks, and kernels of grapes; and, in a word, to give them whatever coſts but very little. And, that the wild beaſts may underſtand, that that is laid before them, it will be proper to ſend out among them one or two which have been tamed at home, which, wandering over the park, may lead the cattle, which ſtand boggling, to the victuals that are thrown before them. And it is expedient, that this be done, not only during the ſcarcity of the winter, but alſo after ſuch as are with young have brought them forth, that they may bring up their young ones the better: therefore the Park-keeper ought frequently to be upon the watch, and ſee if they have already brought forth their young, that they may be ſuſtained with corn given them by hand. But neither ought the ounce, nor the wild boar, nor any other of theſe wild beaſts, to be ſuffered to grow above four years old; for till that time they always advance in their growth; afterwards they decay, and grow lean with old age: wherefore, while their green age preſerves the beauty of their body, they muſt be exchanged for money: but a ſtag can be ſuſtained for a great many years; for he continues long young in your poſſeſſion, becauſe he has a life of a longer duration beſtowed upon him.

But, concerning animals of a leſſer growth, ſuch as the hare, we give thoſe following directions: That, in thoſe parks which are ſurrounded and ſecured with a wall, the ſeeds of barley, and of ſeveral other ſorts of grain, mixt together, and of pot-herbs, wild endive, and lettice, be thrown into ſmall beds of earth made at various diſtances. Let alſo the *Carthaginian* chich-peaſe, or that of our own country, as alſo barley and chichlings, that have been laid up in ſtore, be brought forth out of the barn, and moiſtened with rain-water, and

and thrown before them; for dry things are not too much ſought after by hares. Moreover, it is eaſily underſtood (ſuppoſe I ſhould be ſilent) how improper it is to bring theſe animals, or others like to them, into that park which is ſurrounded with rails; conſidering, that, by reaſon of the ſmalneſs of their body, they eaſily creep under the bars, and, having gotten open paſſages to go out by, they endeavour to make their eſcape.

CHAP. II.

Of Bees.

I Come now to the management of bee-hives, concerning which no precepts can be given with greater diligence, than have been already delivered by *Hyginus*; nor more gracefully and handſomely, than by *Virgil*; nor more elegantly, than by *Celſus*. *Hyginus* has induſtriouſly collected the ſentiments of antient authors, that were diſperſed in their writings, which were unknown to the world. *Virgil* has illuminated them with flowers of poetry; *Celſus* has adapted and made uſe of the manner of both theſe mentioned authors: wherefore we would not have ſo much as attempted to diſcourſe of this ſubject, but that the conſummation of the profeſſion we have undertaken required the handling of this part of it alſo, leſt the body of the work, which we have begun, ſhould appear maimed and imperfect, as if ſome member were cut off from it. And I would rather allow to poetical licence, than to our belief, thoſe things which have been fabulouſly related concerning the origination of bees, which *Hyginus* has not paſt over. Nor, indeed, is it worthy of an Huſbandman, to inquire whether there ever was ſuch a woman as *Meliſſa*, of a moſt exquiſite beauty, which *Jupiter* tranſformed into a bee; or whether (as *Euhemerus* the Poet ſays) bees were bred of hornets and the ſun, which the *Phryxonian* nymphs (1) educated; and that ſoon afterwards they became nurſes to *Jupiter* in the *Dictæan* cave (2); and, by the free gift of the god, they obtained

(1) *Phryxonides nymphæ*. I have not ſeen any other antient author, beſide *Columella*, that mention theſe nymphs: whether he means by them *Amalthea* and *Meliſſa*, daughters of *Meliſſeus*, a king of *Crete*, who, as the fable ſays, educated *Jupiter*, and fed him with honey, I know not. Perhaps they were ſo called, becauſe they were afterwards made prieſteſſes to *Cybele* by their father; and from this *Meliſſæa* the ſucceeding prieſteſſes were, by the antients, called by the ſame name.

(2) *Dicte*, a mountain in *Crete*, where the Poets ſay *Jupiter* was educated.

the ſame food for their own ſuſtenance, wherewith they had brought up their little foſter-child: for, tho' theſe things are not unbecoming a poet, nevertheleſs *Virgil* touched upon them ſlightly, and very briefly, only in one ſmall verſe: *In* Dicte's *cave they fed the king of heav'n.*

But neither does that indeed belong to Huſbandmen; when, and in what country, they were firſt produced, whether in *Theſſaly* under *Ariſtæus* (3); or in the iſland of *Cea* (4), as *Euhemerus* writes (5); or in the times of *Erichthonius* (6), in mount *Hymettus* (7), as *Euthronius* (8); or in the times of *Saturn* of *Crete*, as *Nicander* ſays (9), no more, than whether the ſwarms procreate their offſpring by coupling together, as we ſee other animals do; or chooſe the heir of their family from among the flowers, which our *Maro* affirms; and whether they vomit the liquid honey out of their mouth, or yield it from any other part of their body; for it rather belongs to the ſearchers into the ſecret and hidden things of nature, than to Huſbandmen, to inquire after theſe and ſuch-like things. Alſo theſe things are more agreeable to men of ſtudy and learning, who have leiſure to read, than to Huſbandmen, who are full of buſineſs; becauſe they neither aſſiſt them in their work, nor contribute any thing to increaſe their eſtate.

(3) *Ariſtæus*, a king of *Theſſaly*, the inventor of honey, as *Virgil*, *lib.* iv. *l.* 283.

(4) *Cea* or *Ceos*, an iſland in the *Ægean* ſea; one of the *Cyclades*.

(5) *Euhemerus*, an antient *Greek* writer of *Meſſina* in *Sicily*: he wrote the hiſtory of the heathen gods, their death, burial, *&c.* *Ennius* tranſlated him into *Latin*, and followed his opinion of them. *Tullius*, *de nat. deorum*, *lib.* i. makes mention of him; and ſeems to think, that the account he gave of them took away all pretence for worſhipping them.

(6) *Erichthonius*: ſome make him a king of *Athens*. *Plin. hiſt. nat. lib.* vii. *c.* 56. mentions him as the inventor of ſilver, and the firſt that made uſe of a chariot and four. Perhaps he may be different from another of that name, who was ſon of *Dardanus* the firſt king of *Troas*.

(7) *Hymettus*, a famous mountain in *Attica*, where they ſay is the beſt honey, and where it was firſt found out.

(8) *Euthronius*. Perhaps this is the ſame as *Euphronius*, whom both *Varro* and *Columella* mention as a ruſtic writer.

(9) *Nicander* was of *Colophon*, a city of *Ionia* in the *Leſſer Aſia*: he was both a poet, a phyſician, and an excellent grammarian: his *Theriaca* and *Alexipharmaca* are ſtill extant. Several of his writings are mentioned by *Suidas*; amongſt other things he wrote of Husbandry, which *Tully* commends very much for its poetry, *lib.* i. *de Oratore* *Athenæus* alſo mentions ſeveral of his works. He lived in the times of *Attalus*, the laſt king of *Pergamus*.

CHAP.

CHAP. III.

Of the ſeveral Kinds of Bees, and which of them is the beſt.

WHerefore let us return to thoſe things which are more proper for them who have bee-hives under their care and management. *Ariſtotle*, the founder of the *Peripatetic* ſect, in thoſe books which he wrote of animals, ſhews, that there are ſeveral kinds of bees, or of ſwarms of bees; and that ſome of thoſe ſwarms have bees that are exceeding large, but round and compact, and the ſame black and ſhaggy; others leſſer indeed, but equally round, and of a duſky colour, with horrid griſly hair; and others of a ſmaller ſize, but not ſo round, but nevertheleſs fat, and broad, and of a ſomewhat better colour: and they have ſome that are very ſmall and ſlender, with the trunk of their belly ſharp, and drawing to a point, of divers colours, ſomewhat ſhining like gold, light and nimble. And *Virgil*, following his authority, approves moſt of ſuch as are very ſmall, oblong, ſmooth and nimble, bright and ſhining (r):

'Whoſe bodies, mark'd with pairs of ſpots like drops
'Of liquid gold, a dazling luſtre caſt:'

Of gentle and mild diſpoſitions; for by how much the greater, and rounder alſo, the bee is, by ſo much the worſe it is: but if it be of a more fierce and cruel temper, it is by much the worſt of all. But, nevertheleſs, the angry diſpoſition of bees of a better character is eaſily mitigated and ſoftened by the continual intervention of thoſe who take care of the bee-hives; for they grow quickly tame when they are often handled, and endure for ten years, if they are carefully managed: nor can any ſwarm of bees exceed this age, although they yearly ſubſtitute young ones in the room of thoſe that are dead; for, in the tenth year, almoſt the whole family, that lives together in one hive, is conſumed, and reduced to utter deſtruction. Therefore, leſt that ſhould be the caſe of the whole apiary, a new race muſt be conſtantly propagated; and, in the ſpring, you muſt carefully obſerve when the new ſwarms iſſue forth in great numbers, that they may be received, and the number of their dwelling-houſes increaſed: for they are often ſeized with diſeaſes. After what manner the ſame muſt be cured, ſhall be declared in its proper place.

(r) *Virg. Georg. lib.* iv. 98.

CHAP. IV.

Of the Paſtures proper for Bees, and what Sort of Situation the ſame ought to have.

IN the mean while, having made choice of bees according to the marks we have now mentioned, you ought to deſtinate proper places for them to gather their food; and let them be the moſt retired that can be had; and, as our *Maro* directs, void of cattle, and in ſuch a ſituation as is expoſed to the Sun, and ſheltered from ſtormy weather (1);

'Where winds have no acceſs; for winds impede
'Their courſe, when with their food they're homeward-bound,
'Where neither ſheep, nor friſking kids, inſult
'The flow'rs; nor heifers, rambling o'er the fields,
'Shake off the dew, and cruſh the riſing herb.'

Let the ſame quarter alſo be abundantly productive of ſmall ſhrubs, and eſpecially of thyme, or baſtard marjoram (2), as alſo of thymbra, or Greek ſavory, or our own *Italian* ſavory, which the country-people call *ſatureia:* after theſe, let there be abundance of ſhrubs of a greater growth, as roſemary, and the *cytiſus* or ſhrub-trefoil (3), of

(1) *Virg. Georg. lib.* iv. 9.

(2) *Origanum*, baſtard-marjoram; ſo called, becauſe it delights in mountains.

(3) *Cytiſus.* We ſee here, that our author places the *cytiſus* among the ſhrubs. *Pliny* alſo, *Hiſt. Nat. lib.* xiii. *c.* 23. calls it a ſhrub. It is mightily commended by many antient authors, as good for ſheep, ſwine, hens, *&c.* and they ſpeak of it as a mighty common thing in *Italy* in their days; ſo that it is ſtrange, that writers are not agreed about it. Both *Columella* and *Pliny* ſpeak of it, as if it were ſown or planted, grew up, and were cut down, like trefoil. *Pliny* ſays, it may be ſown in ſeed, or planted in ſtalks; and if any would expreſs the likeneſs of it, it is *anguſtioris trifolii frutex*, has leaves like trefoil, but leſſer: and *Dioſcorides* ſays, κύτισος δάμνος ἐστὶν, *i. e.* a ſhrub or buſh. *Pliny* ſays it was found in the iſland *Cythiſus*, from thence tranſlated into all the *Cyclad* iſlands, and ſoon afterwards into all parts of *Greece.* It ſeems, it was not very plentiful in *Italy* in *Pliny*'s time; for he ſays, that, conſidering the uſefulneſs of it, he wonders that it is ſo rare. All writers upon Husbandry celebrate it much, which makes it ſeem ſtrange, that it has not been more cultivated, or, at leaſt, that it is not better known. The account that *Columella* and *Pliny* give of this ſhrub, does not very well agree with what our writers ſay of it. *Pliny*, as has been already ſaid, among other things, ſays, that it may either be ſown in ſeed at the time they ſow barley, or ſet in ſtalks or ſlips (*caule*) in autumn before winter; that it comes to perfection in three years, and is cut down about the equinox; that it is of an hoary aſpect, and ſo hardy, that it fears neither heat nor cold, hail nor ſnow.

both

both ſorts: for there is one ſort of it that is ſown or planted, and another ſort which grows of its own accord. And, likewiſe, the ever-green pine, and the leſſer ever-green oak; for the taller one is diſapproved by all: ivy-trees alſo are received, not for their goodneſs, but becauſe they yield very much honey. But, the moſt approved trees are, the bright-red and white jujube-tree, likewiſe the *amaranth* (4), as alſo walnut-trees, peach-trees, and pear-trees; in a word, the greateſt part of pomiferous trees, that I may not inſiſt upon each of them. But, of foreſt or wild trees, the moſt ſuitable and convenient for them are the maſt-bearing red oaks, as alſo the turpentine-tree, and the maſtich-tree, which is not unlike to this, and the ſweet-ſmelling cedar: but of all, the lime- or linden-trees alone are hurtful to them; yew-trees are intirely rejected. Moreover, a thouſand plants, which either ſpring up and flouriſh upon the uncultivated turf, or are cultivated and improved with the furrow, produce flowers exceeding friendly to bees; as are the ſhrubs of the *amellus* (5) in

(4) *Amaranthus.* The *amaranth*, ſo called, becauſe its flower does not ſoon wither, but keeps the beauty of its colour a long while. Some authors call it *flower-gentle*, and the *amaranthus maximus* they call *great floramour*, or *purple flower-gentle:* but ſome authors think, that it ought not to be read *amaranthus*, but *tamarix*, becauſe the author is here ſpeaking of trees, and not of herbs; and the *tamarix*, when it flouriſhes, is very proper for bees.

(5) *Amelli frutex.* There is ſome diſpute about this herb; *Matthiolus* thinks that it is the *aſter Atticus*, the *Italian* ſtarwort, becauſe *Virgil's* beautiful deſcription, *Georg. lib.* iv. ſhews, that it has certain characters which belong to the *aſter Atticus*; and that the words in *Virgil*, *ipſe aureus*, ought to be underſtood of the flower itſelf; and the following words, *ſed in foliis quæ plurima circum funduntur, violæ ſublucet purpura nigræ*, are to be underſtood of the leaves that ſurround the flower itſelf, which ſomewhat reſemble the black violet in their colour: therefore he ſays *ſublucet purpura*, becauſe that purple colour, which is ſeen in theſe leaves, is not ſo bright as in the violet itſelf, but much more diluted; ſo that it is a great miſtake to think, that *Virgil* underſtood this colour to be that of the leaves of the herb. Moreover *Virgil*, in effect, ſays, that the flower of this herb is found in the end of ſummer, or beginning of autumn, *tonſis in vallibus*, in the mown valleys, it growing up after the hay is cut down. The deſcription he gives of the *amellus* is this: 'It is an herb that ſends forth from its 'root ſtraight, ſolid, and woody ſtalks, of a dark, yelloviſh colour, from which, about 'the top, ſpring forth ſmall little branches, on the top of which are ſeen flowers radiated 'after the manner of a ſtar; in the middle they are yelloviſh, all ſurrounded with little 'leaves, ſhining with a diluted purple colour; it bears leaves acuminated like thoſe of 'the olive-tree, but ſmaller, rough, hairy, blackiſh, of a rough-bitteriſh taſte; thoſe 'that ſurround the ſtalk are by much the ſmalleſt: it has a multifidous fibrous root, of 'no unpleaſant ſmell, ſomething like that of gilliflowers. It bloſſoms or flouriſhes in 'the end of ſummer, or beginning of autumn, in *Auguſt* and *September*; the leaves 'grow at length flaccid, and diſſolve into down, with a ſmall oblong ſeed, not very 'unlike endive: it grows in rough uncultivated hills and valleys.' I have tranſcribed this out of *Matthiolus*, becauſe I have not found it under this name in any of our beſt

in well-watered ground, branke-urſine-ſtalks, the ſhank of the *aſphodel* or king's-ſpear (6), the ſword-like leaves of the daffodil (7). But the white lilies, planted in the garden-ridge, make a bright appearance; nor are the white violets or ſtock-gilliflowers inferior to theſe in beauty; alſo ſcarlet roſes, and yellowiſh and purple violets (8); and likewiſe the ſky-coloured hyacinth (9); alſo the *Corycian* (10) and *Sicilian* ſaffron-bulb is planted, in order to give a colour and flavour to the honey. Moreover, innumerable herbs of a baſer character ſpring up, both in cultivated- and in paſture-lands, which furniſh and repleniſh the honey-combs with abundance of wax; as the *lapſanæ*, or common wild coleworts (11); and, which is not more precious than

Engliſh books of herbs. *Columella*, *cap.* 13. ſays, there is a ſort of it with a yellowiſh ſtalk, and purple flower.

(6) *Aſphodeli ſcapus*, by *Pliny* called *bacillus regius*, or *haſtula regia*, king's-ſpear, becauſe, when it is in the flower, it reſembles a royal ſceptre. Some *French* authors call it *hache royale:* it has a round and very ſmooth ſtalk, which riſes a cubit high, ſometimes two cubits. *Columella* calls the ſtalk of it *ſcapus*, becauſe it reſembles the ſhank or ſhaft of a column.

(7) *Narciſſus*, daffodil. Probably ſo called from ναρκη, *torpor*; the ſmell of it is ſtupefying, and cauſes an heavineſs of the head: its leaves, which ariſe from its root, are ſhaped like a ſword, which is the reaſon why our author ſays *gladiolus narciſſi*. There are many different ſorts of it, which Mr. *Miller*, in his Dictionary, gives us an exact deſcription of: and *Matthiolus* has given us cuts of the different ſorts, whoſe leaves have all the ſhape of a ſword, ſome broader, ſome narrower: perhaps the bees ſuck honey out of the leaves and flowers.

(8) *Sarranæ violæ*, purple violets. *Sarranus*, the purple colour, either from *ſarra*, the name of the ſhell-fiſh, with whoſe blood they dyed this colour; or from *Sor*, the *Hebrew* name of *Tyre* and *Sidon*. *Sarranæ veſtes*, in many authors, ſignify cloaths of a purple colour. Some ſay, that formerly *Tyre* was called *Sarra*, and the fiſh *Sar*.

(9) *Cæleſtis numinis hyacinthus*. The learned *Morgagni* of *Padoua* thinks, that it ought to be read *luminis*, ſo that the author means the ſky-blue hyacinth; this would be very well, if warranted by ſome manuſcript: what makes it very probable is, that *Columella* very frequently mentions the colour of herbs, or of their flowers, without any further deſcription; or perhaps he means, that this flower was ſacred to ſome deity.

(10) *Corycius bulbus croci*. *Corycus*, a high hill in *Cilicia*, where grew plenty of excellent ſaffron. *Pliny* gives the preference to the *Cicilian*, eſpecially to that which grew upon this mountain, next to the *Lycian* upon mount *Olympus*, and the third place to that of *Sicily:* he ſays, that it is eaſily adulterated; he gives a mark whereby to know the genuine, *viz.* if it cracks, and makes a noiſe when the hand is laid upon it, as if it were brittle, this is to be underſtood, when it is dry; and that the moiſt, which becomes ſo by adulteration, yields when it is handled. Another ſign of its being genuine is, that, when any one has handled it, and brings his hand to his mouth, it gently bites the face, and the eyes; with ſeveral other remarks to be ſeen in his *Natural Hiſtory*, *lib.* xxi. *cap.* 6.

(11) *Lapſana*. *Pliny* places it among the wild coleworts or cabbage; ſays it is a foot high, with hairy leaves, very like thoſe of the navew, except that it has a whiter flower, *lib.* xx. *cap.* 9. And in another place he calls it *olus ſilveſtre trium foliorum*; a wild kind of pot-herb, with three leaves, much celebrated by ſome verſes *Julius Cæſar* made

than theſe, the wild radiſh (12), and the *charlock*, or wild muſtard pot-herb, and the flowers of wild endive, and black poppy; alſo the wild parſnip, and the cultivated one of the ſame name, which the *Greeks* call *ſtaphylinon*. But of all theſe I have mentioned, and of thoſe which I have omitted, endeavouring to ſave time, (for their number could not be reckoned up) thyme gives the moſt exquiſite taſte to honey: then the next is *thymbra* or *Greek* ſavory (13), and mother of thyme: of the third ſort, but yet exceeding good, is roſemary, and our own *Italian* ſavory, which I call *ſatureia*: then tamariſk- and jujeb-flowers, and the other kinds of food which we have propoſed, are of a middling taſte. But, of all, wood-honey, which cometh of the broom-tree, and the ſtrawberry-tree, and the manor-houſe honey alſo, which breeds in pot-herbs, and in herbs that grow in dunghils, are reckoned of the very worſt character. And ſince I have deſcribed the ſituation of their paſtures, and alſo their ſeveral ſorts of food, I ſhall now ſpeak of the receptacles of the ſwarms, and of their little dwelling-houſes.

made upon it, which his ſoldiers uſed to ſing by turns; and by theſe, and their own military jokes, they uſed to reproach him with their living upon this herb at *Dyrrhachium*, ſcoffing and cavilling at the niggardly rewards they received for the hardſhips they endured. Some think that the root, wherewith *Julius Cæſar*'s army ſuſtained themſelves, and of which they made bread, was different from this, and was the wild parſnip.

(12) *Armoracia*, the wild radiſh. The *Italians* have made but very little alteration in this word, and call it *aramorisco*, and *remolaco*. *Dioſcorides* ſays, Ῥαφανὶς ἀγρία, ἣν Ῥωμαῖοι ἀρμοράκιαν καλοῦσι, the wild radiſh, which the *Romans* call *armoracia*.

(13) *Thymbra*. Some make this *thymbra*, *cunila*, and *ſatureia*, to be the very ſame; but our author ſeems to make them different herbs. *Matthiolus* ſays, that there are two ſorts of the *thymbra*; firſt, that of *Dioſcorides*, which is like thyme, but leſſer and tenderer; that its ſmall ſtalks end in ſpiked proceſſes, in which appear flowers ſomething of a purple colour: the other ſort is more buſhy, with many little, round, woody branches circularly diſpoſed: that it has leaves larger than thyme, ſomewhat rough, and harder, which ſprout out about the ſhoots ſeveral together, at certain diſtances; and from the place where theſe leaves ariſe, certain ſpiked proceſſes come forth, crouded with little leaves ſmaller than the reſt, out of which ſpring ſmall flowers, tending from purple to white: and this he thinks to be the *cunila* ſo often mentioned by *Columella*; and that in *Tuſcany* they call it *coniella*, which is a corruption of *cunila*. *Pliny* ſays, that it has ſeed like that of penny-royal. See *Matthiolus* in *Dioſcorid.* for a further deſcription of it.

CHAP.

CHAP. V.

Of chuſing Seats for Bees.

A Seat for bees muſt be placed oppoſite to the Sun at noon, in the middle of winter, far from tumult, and crouds of men and cattle, in a place neither warm nor cold; for both the one, and the other, is very troubleſome to them. But let it be in the lower part of a valley, that both the empty bees, when they go forth to forage, or to gather their food, may fly up the more eaſily to the higher grounds; and, having gathered ſuch things as are proper for their uſe, may fly down through the ſteep places, with their burden, without any difficulty.

If the ſituation of the manor-houſe will admit of it, it is not to be doubted, but we ſhould join the apiary to the building, and ſurround it with a wall; but it muſt be in that part which is free from the noiſome ſmells of the neceſſary-houſe, the dunghil, and the bagnio. But, ſuppoſe the ſituation be unfavourable, nevertheleſs, if other very great inconveniences do not concur, it is more expedient, that the apiary be thus placed, and be under the eyes of the owner. But, if all things be unfriendly, without doubt let a neighbouring valley be pitched upon, whither the poſſeſſor may frequently go down without any great inconveniency: for that buſineſs requires the greateſt honeſty and fidelity; which, becauſe it is exceeding rare, is better ſecured and preſerved by the owner's coming unawares. Nor does it only hate and abhor a fraudulent Overſeer and Manager, but ſlothfulneſs alſo, which produces naſtineſs: for it is equally provoked and offended with dirty and ſlovenly treatment, as with fraudulent management.

But, where-ever the bee-hives ſhall be placed, let them not be incloſed with a very high wall; and if, through fear of robbers, you are better pleaſed with one that is higher, let it be paſſable for the bees, with ſmall windows, all in a row, three feet high from the ground; and let a cottage be joined to it, wherein both the Keepers may dwell, and the implements be laid up: and let it be chiefly repleniſhed with hives prepared before-hand for the uſe of the young ſwarms, as alſo with wholſome medicinal herbs; and if there be any other things which are applied to ſuch as are ſick and languiſhing.

'And let the palm, or huge wild-olive tree
'O'erſhade the porch, that, when new kings lead forth
'The firſt-hatch'd ſwarms; and when the ſportive youth,
'From cloſe confinement freed, ſhall, in the ſpring,
'Make ſallies from their hives, and play all round;
'The neighb'ring bank may, from the ſcorching heat,
'Invite them to retire; and th' obvious tree
'With verdant leavy ſhelters ſtop their flight (1).'

Then let continually running water, if you have the conveniency of it, be conveyed into it; or let it be given by hand in a canal or trough, built for that purpoſe, without which neither the honey-combs, nor the honey, nor the young bees, can be formed. Whether therefore, as I ſaid, water that is conſtantly running by, or well-water, be ſent into them by canals, let there be piles of ſtones and rods raiſed in it for the conveniency of the bees (2);

'That on theſe frequent bridges they may ſtand
'Secure, and to the ſummer-ſun expand
'Their wings, if chance the eaſt wind's headlong blaſt
'Has ſprinkled, or has plung'd them in the deep.'

Then round the whole apiary ought to be planted little trees of ſmall growth, eſpecially for their wholſomeneſs: for *cytiſus* or ſhrub-trefoil, as alſo the caſſia, and the pine-trees, and roſemary, are a remedy for them when they are languiſhing; as alſo the ſtalks of wild marjoram and thyme; as alſo thoſe of violets, or whatever other things the quality of the ground ſuffers to be uſefully planted. Let not only green things of a diſagreeable and noiſome ſmell, but alſo all other things whatſoever, of the ſame quality, be kept at a diſtance from them; ſuch as the ſmell of a crab, when it is burnt in the fire; or the ſmell of mud and dirt taken out of a marſh. Likewiſe let hollow rocks, or ſhrill loud-ſounding valleys, which the *Greeks* call ἠχεῖα, (echoes) be avoided.

(1) *Virg. Georg. lib.* iv. 20.
(2) *Virg. Georg. lib.* iv. 27.

CHAP.

CHAP. VI.

Of ſuch Sorts of Bee-hives as ought to be approved.

THerefore, when their ſeats are put in order, bee-hives muſt be fabricated according to the condition and circumſtances of the country. For if it be fertile of the cork-tree, without any doubt we may make very uſeful hives of its bark, becauſe they are neither extremely cold in winter, nor exceeding hot in ſummer: or, if it abounds in fennel-giants, of theſe alſo vaſes are woven with equal conveniency, as they are like to the nature of bark. If neither of theſe is ready at hand, they join willows together, and weave them like weavers work: and, if theſe cannot be had, they muſt be made of the wood of a tree made hollow, or ſawn into boards. Thoſe made of potters earth have the very worſt quality of any; for the ſummer-heats ſet them on fire, and they are frozen with the winter-colds.

There are two other kinds of hives remaining, which may either be made of dung, or built of brick: one of which *Celſus* very juſtly diſapproved, becauſe it is very obnoxious to fire; the other he approved, tho' he did not diſſemble its chiefeſt diſadvantage, *viz.* that, if there ſhould be occaſion for it, it cannot be removed from one place to another: therefore I do not agree with him who thinks, that, notwithſtanding this inconveniency, bee-hives of this kind ought to be had; for not only is it repugnant to the intereſt of the owner, that they be ſuch as cannot be removed, when at any time he may have a mind either to ſell them, or to furniſh other grounds with them (for this conveniency relates only to the advantage of the Maſter of the family); but as to what ought to be done for the advantage, and on the account, of the bees themſelves, when they are afflicted either with a diſtemper, or with the barrenneſs and penury of the place; and it may be proper, that they be ſent into another quarter; and they cannot be moved for the foreſaid reaſon; this is principally to be avoided. Therefore, altho' I reverence the authority of that moſt learned man, yet, ſetting aſide all ambition, I have not omitted to declare my own opinion: for that which chiefly moves *Celſus*, *viz.* leſt the bee-ſtalls be liable either to fire or thieves, may be avoided by building a brick-work round the hives, that an obſtacle may be put to the rapaciouſneſs of the robber, and the hives be protected againſt the violence of fire: and when it is neceſſary to move them,

and carry them to another place, it may be done by looſening the joinings of the ſtructure.

CHAP. VII.

After what Manner the Hives muſt be placed.

BUT becauſe moſt people think, that this requires too much labour and pains, therefore whatever ſort of hives they ſhall think moſt proper to be placed, there ought to be a bank of ſtone extended through the whole apiary, three feet in height, and as many in thickneſs; and, when it is thus built, it ought to be carefully ſmoothed with plaiſter, that there may be no way for lizzards, or ſerpents, or other noxious animals, to climb up to them. Then upon this bank are placed, either (as *Celſus* directs) domicils made of bricks, or (as we are beſt pleaſed with) hives, with brick-work built about them, except behind: or, which is the common practice with all people, who are diligent and careful about theſe things, there are vaſes placed all in a row, which are faſtened and bound either with ſmall bricks, or with rough ſtone and mortar, ſo that each of them is contained within two narrow walls, and the back- and fore-parts are open and free: for ſometimes they muſt be laid open both on that ſide where the bees go forth, and much more on the back-ſide, becauſe the ſwarms are cured from time to time.

But if no walls are built between the hives, nevertheleſs they muſt be ſo placed, that they may be a little diſtant from each other, leſt, when they are viewed and looked into, that which is handled in the cleaning and curing of it, ſhould ſhake the other, which ſticks cloſe to it, and bruiſe the neighbouring bees, which are afraid of every motion given to their weak wax-works, as of ruin and deſtruction to them. It is ſufficient indeed, that there be three rows of vaſes built up in height one above the other, becauſe even ſo the perſon that cures them cannot very conveniently look into the uppermoſt.

Let the mouths of the hives, which afford entries to the bees, lean more downward, and be more ſloping, than their backs, that the rains may not flow into them; and if, notwithſtanding, they chance to get in, that they may not remain there, but run out by the entry: for which reaſon it is proper, that the hives be fenced and ſecured with porches above the entries: if otherwiſe, they muſt be ſhadowed

with green boughs daubed over with *Carthaginian* clay, which covering keeps out both the colds, and the rains, and the heats. Nevertheleſs the burning heat is not ſo hurtful to this kind *of animals* as the winter is: therefore let there always be a building behind the apiary, which may receive the injury of the north wind, and give a moderate heat to the bee-hives. Likewiſe the domicils themſelves, altho' they be protected by the building, ought to be ſo placed, as to be directly oppoſite to the ſun-riſing in winter, that ſo the bees may have the benefit of the warmth of the ſun when they go out in the morning, and may be thereby the more briſk and active; for cold begets ſluggiſhneſs: for which reaſon alſo the holes, by which they go out and come in, ought to be very ſtrait, that they may admit as little cold as poſſible: and it is ſufficient, that they be ſo bored, that they may not receive more than one bee at its full growth. So neither the poiſonous newt, nor the unlucky and miſchievous kind of beetle or butterfly, nor the light-ſhunning wood-louſe, as *Maro* ſays, plunder the honey-combs through the gate, when it is wider and larger than it ought to be. And it is a very great advantage, that, in proportion to the number of bees in the bee-hive, there be two or three paſſages made in the ſame cover, at ſome diſtance the one from the other, to guard againſt the deceit and craft of the lizzard, who, like a watch or keeper of the entry, and gaping for his prey, with open mouth deſtroys the bees as they go out; and fewer of them periſh when they are at liberty to avoid the ſnares of this peſt, that beſieges them, by eſcaping through another paſſage.

CHAP. VIII.

Of purchaſing Bees, and how wild Swarms may be taken.

WHAT we have ſaid may ſuffice concerning the chuſing of paſtures, dwelling-houſes, and ſeats for them; which being provided, the next thing we are to do is to ſeek for ſwarms: and they come to us either by purchaſe, or by free gift. But ſuch of them as we ſhall purchaſe with money, let us try, and approve them more carefully by the foreſaid marks: and let us conſider how numerous they are before we buy them, by opening the hives, and looking into them: or, if we cannot conveniently look into them, doubtleſs we ſhall mark what we can caſt our eyes upon, whether there

there are very many of them ſtanding in the porch of the gate, and a vehement ſound be heard of thoſe that are humming within doors; and alſo (if peradventure they are all ſilent, and at reſt within their dwelling-houſe) we may make an eſtimate either of the greatneſs or ſmalneſs of their number, from the ſudden noiſe and murmuring, that will follow upon our having applied our lips to the holes of the entry, and breathed ſtrongly into them.

But we muſt eſpecially be careful, that they be brought rather from the neighbourhood than from diſtant regions, becauſe they uſe to be highly provoked with the ſtrangeneſs of the climate. But if this cannot be obtained, and we be under the neceſſity of carrying them long journeys, we muſt take care, that they be not diſturbed and made uneaſy by the ruggedneſs of the roads: and it will be beſt to carry them upon one's ſhoulders in the night-time; for in the day-time they muſt have reſt given them; and ſuch liquors as are acceptable to the bees muſt be poured into the hives, whereby they may be nouriſhed within their incloſures. Then after they are brought home, if the day come upon you ſooner than you expected, the hive muſt neither be opened, nor placed in the bee-ſtall, except in the evening, that the bees may go out peaceable and quiet in the morning, after they have reſted the whole night: and we ought to be upon the watch for the ſpace of three days almoſt, to obſerve if they ſally out all in a body; which when they do, they are contriving to make their eſcape: we muſt preſently give orders for ſuch remedies as ought to be made uſe of, in order to put a ſtop to them. But ſuch as come into our hands, either in preſents, or which we catch by ſurprize, are not ſo ſcrupulouſly inquired into: although even in that manner, I would not have any in my poſſeſſion but the very beſt; ſeeing both the good and the bad require the ſame expence, and the ſame labour of a Keeper: and, which is of very great importance, the baſe and degenerate, which may bring infamy and reproach upon thoſe that are of a generous kind, muſt not be intermixed with them; for the produce of honey is leſs than you expected, when more ſlothful and idle ſwarms intervene.

Nevertheleſs, becauſe ſometimes, by reaſon of the nature and circumſtances of the places, we muſt provide ourſelves even with cattle that are but indifferent, (for, to be ſure, that which is bad is by no means to be provided) we muſt uſe our endeavours to ſearch out the ſwarms after this manner: Where-ever there are foreſts proper for making of honey, there is nothing that the bees do ſooner, than to make choice of the neighbouring fountains, which they may make

uſe of. Therefore it is proper to beſet them, for the moſt part, from the ſecond hour of the day, and to watch what numbers of them come to fetch water: for, if there are few of them that fly about, (except there be ſeveral heads of rivulets, which make them thinner, when they are ſeparated from one another) they give us to underſtand, that there is a ſcarcity of them; by reaſon of which we will ſuſpect, that the place is not productive of honey. But, if they aſſemble in great numbers, they give us alſo greater hopes of catching ſwarms of them, and they are found out after this manner:

Firſt, we muſt ſearch, and find out, how far off they are; and for this purpoſe liquid oker muſt be prepared, wherewith having tinged ſome ſtraws, or ſtalks of herbs, when with the ſame you touch the backs of the bees that ſip in the fountains, if you ſtay in the ſame place, you will the more eaſily know them, when they come back; and if they make no great ſtay, you may know, that they have their abode in the neighbourhood: but, if they be a long while before they return, you ſhall make an eſtimate of the diſtance of the place according to the time of their delay. But, if you obſerve, that they return quick, if, with no great difficulty, you can follow them in the way they fly, you ſhall be eaſily conducted to the place where the ſwarm has its ſeat.

But you muſt make uſe of more ſkill and prudence, with reſpect to thoſe which ſhall be ſeen to go farther off; which is ſuch as this: You muſt cut off an intire joint of a reed with its own knots, and bore an hole in the ſide of the cutting; and, having dropped a little honey, or ſodden muſt, into it through the ſaid hole, you muſt place it hard by the fountain: then, when, at the ſmell of the ſweet liquor, ſeveral bees ſhall have crept into it, you muſt take up the cutting; and, having put your thumb upon the hole, you muſt let out only one of them at a time, which, after it has made its eſcape, ſhews the Obſerver the place to which it directs its courſe; and he, as long as he can hold it out, purſues it as it flies away: then, when he loſes ſight of the bee, he ſends out another; and if it flies towards the ſame part of the heaven, he continues to purſue in the ſame path; but if otherwiſe, he ſuffers one after another to go out at the open hole: and let him mark the quarter towards which moſt of them fly, and purſue them, till he be brought to the lurking-hole of the whole ſwarm.

But, if the ſwarm be hid in a cave, you may fetch them out with ſmoak; and, when they have ſallied out, you check and ſtop them with the noiſe of braſs: for, being preſently terrified with the ſound, they

they will ſit down either upon a ſhrub, or on an higher bough of a tree; and the perſon that ſearches for them, and finds them out, puts them up in a vaſe prepared for that purpoſe. But if they have taken up their ſeat in an hollow tree, and if either the branch, which they have ſeated themſelves upon, ſtands out from the body of the tree, or they are in the very trunk of the tree itſelf, then, if the middling ſize of it will ſuffer it, firſt the upper-part of it, which is empty of bees, is cut off with a very ſharp ſaw, that it may be done the ſooner; then the lower part alſo, as far as it ſeems to be inhabited. Then, after it is cut through at both ends, it is covered over with a clean garment; for this alſo is of very great importance; and, if it has any gaping chinks, you fill them up with clay, and ſo bring it to the place: and, ſome ſmall holes in it (as I ſaid already) being left open, it is placed in the ſame manner as the reſt of the bee-hives.

But it is proper, that the perſon, who makes it his buſineſs to ſearch for them, and find them out, make choice of the morning-tide, that he may have the whole day before him to ſpy out the places where the bees frequent, and go and come. For often, if he has begun to obſerve them too late, when they have their ſeat in the neighbourhood, they retire, after they have finiſhed their ordinary taſk of work, and do not return to the water; whereby it comes to paſs, that the perſon who ſearches for them is ignorant how far the ſwarm is diſtant from the fountain. There are ſome who, in the beginning of the ſpring, gather mint, and (as the foreſaid poet ſays)

'Bruis'd balm, and honeywort's ignoble graſs (1);'

And other-like herbs, wherewith this kind of animals is delighted; and ſo rub the hives throughly with them, that the ſmell and the juice of them may ſtick to the veſſel; which, when they have cleaned them, they ſprinkle again with a little honey, and place them up and down the woods not far from the fountains; and, when they are filled with ſwarms, they carry them home. But it is not expedient to do this, except in places where there is abundance of bees; for often they who by chance paſs by, when they find the empty veſſels, carry them away with them: nor is the obtaining one or two full ones of ſo great account, as to compenſate the loſs of ſeveral empty ones. But in a greater plenty, altho' many of them are intercepted, yet more is acquired by the bees that are found: and this is the method of catching wild ſwarms of bees.

(1) *Virg. Georg.* iv. 70.

CHAP.

CHAP. IX.

After what Manner our own Country-Bees ought to be obſerved, and put up into Hives.

MOreover, there is ſuch another method of retaining the ſwarms that are bred in our own country. The Keeper, indeed, ought always carefully to go round the bee-hives; for there is no time wherein they do not want his care and management: but they require a more punctual and diligent attendance, when they ſwarm in the ſpring, and their new offſpring breaks out of their hives, which cannot contain them; and unleſs the Overſeer conſtantly beſieges them, and preſently receives and entertains them, the young ones make their eſcape; becauſe, ſuch is the nature of bees, that every commonalty is generated at the ſame time with their kings, which, as ſoon as they have got ſtrength to fly out of their hives, diſdain and deſpiſe the company, and the ſociety, of their ſeniors, and much more their government and command: for as mankind, endued with reaſon, will not allow of any partnerſhip in the regal power, far leſs will theſe dumb animals, who are deſtitute of counſel.

Therefore the new chieftains come forth with their youth, which remaining conglomerated for one or two days in the very porch of their dwelling-houſe, by their coming out of it they ſhew, that they deſire to have a ſeat of their own; and if one be preſently aſſigned them by their Keeper, they are ſatisfied with it, as if it were their native country. But if the Keeper be out of the way, and neglects it, they go to a ſtrange country, as if they were wrongfully caſt out of their own. To prevent this, it is the buſineſs of a good Overſeer to have his eyes upon the hives, during the ſpring-time, almoſt till the eighth hour of the day, after which the young ſwarms do not precipitantly withdraw themſelves; and carefully to watch and obſerve both when they go out, and when they return: for there are ſome, which, breaking out all of a ſudden, ſteal away without any delay. He may certainly find out, and know beforehand, their intended flight, by applying his ear to each of the hives in the evening: for ſo it is, that almoſt for three days before they deſign to make an eruption, there ariſes a tumult, and confuſed noiſe and murmur among them,

them, as of an army going to march: from which, as *Virgil* ſays very truly (1),

'Tis eaſy to foreknow the vulgar's minds:
For ſuch as loit'ring ſtand, the martial ſound
Of the hoarſe braſs reproves; likewiſe a voice
Is heard, which imitates the broken ſounds
Of trumpets.'

Therefore the hives that do this ought eſpecially to be obſerved, that whether they ſhall ſally out to battle, (for they often fight amongſt themſelves, as in civil wars, and with other hives, as with foreign nations) or break out all of a ſudden, in order to make their eſcape, the Keeper may be preſent, ready prepared for both events. A quarrel, indeed, either of one hive diſagreeing among themſelves, or of two hives at variance the one with the other, is eaſily quelled: for, as the ſame poet ſays (2),

'With throwing of ſmall duſt the ſtrife is check'd,
And ceaſes'—

Or with raiſin-wine, or mead, or any other ſuch-like liquor ſprinkled upon them: for ſo it is, that the ſweetneſs of theſe things, being familiar to them, appeaſes their wrath, when they are in a rage. For the ſame things alſo have a wonderful influence to reconcile the kings that are at variance: for often there are more captains of one people, and by the ſedition, as it were, of the nobility, the common people is divided into factions, which muſt not be ſuffered to happen frequently, becauſe whole nations are conſumed by inteſtine wars. Therefore, if the princes be in friendſhip and favour with one another, peace continues without bloodſhed: but, if you ſhall obſerve them very often engaged in a pitched battle, you ſhall take care to kill the ring-leaders of the ſeditions; but by the foreſaid remedies, their battles and quarrels are compoſed. And, furthermore, when a great multitude of them ſits down all in a lump, upon the next branch of a green leavy little tree, obſerve whether the whole ſwarm hangs down from it like one cluſter of grapes: and this ſhall be a ſign, either that there is only one king among them; or that, if there be more of them, they are heartily reconciled; which you may ſuffer to continue ſo, till they fly back again to their own habitation.

(1) *Virg. Georg.* iv. 70.
(2) *Virg. Georg.* iv. 87.

But if the ſwarm be divided and diſtinguiſhed, as it were, into two, or ſeveral udders alſo, you need not doubt but there are ſeveral rulers among them, and that they are as yet angry: and you ought to ſearch for their captains in thoſe parts wherein you ſee the bees are aſſembled and conglomerated in greateſt numbers. Therefore, having anointed your hand with the juice of the fore-mentioned herbs, that is, of balm-gentle or mint, leſt they run away when you touch them, you muſt put in your fingers gently among them; and, having ſeparated the bees from one another, you muſt ſearch till you find the author of the quarrel, whom you ought to ſqueeze to death.

CHAP. X.

Of the Form and Make of the King of the Bees.

BUT theſe kings are a little larger and more oblong than the other bees, with ſtraighter legs, but not ſo large wings, of a beautiful bright-ſhining colour, briſk and nimble, and without hair, without a ſting, unleſs any think, that the fuller hair, as it were, which they carry in their belly, is their ſting; and even of this itſelf they make no uſe to hurt withal. Some of them alſo are found of a duſky colour, and briſtly, whoſe diſpoſition and temper you may condemn from the habit and make of their body.

'Two ſorts of features, and two diff'rent forms
'Of bodies, have the kings, which rule this folk:
'The one with ſpots of gliſt'ring gold adorn'd,
'And with bright-ſhining ſcales, and comely face,
'In ſplendid ſtate appears (1).'

And this, which is the beſt of the two, is moſt approved; for the worſt, like ſordid ſpittle, is as ugly and ill-favoured as

'The traveller, who comes from depths of duſt,
'And from his parched mouth ſpits moiſt'ned earth:'

And, as the ſame poet ſays,

'With ſloth inglorious drags his ſpacious paunch.'

(1) *Virg. Georg.* iv. 93—95.

Therefore

Therefore all the Generals of a baſer character

'Deſtroy, and let the better Prince bear ſway,
'And reign without a rival in his court.'

Nevertheleſs he himſelf muſt be ſtript of his wings, when he often makes eruptions with his ſwarm, and endeavours to run away: for, having pulled off his wings, we ſhall retain the vagabond General, as it were, with a chain at his foot; who, being deprived of all means of making his eſcape, will not dare to go without the bounds of his kingdom; for which reaſon he does not indeed allow the people of his dominion to ramble up and down, and wander at a greater diſtance from him.

CHAP. XI.

How the Smalneſs of the Number of the Bees may be remedied.

BUT ſometimes the King muſt be put to death, when the old bee-hive has not a ſufficient number of bees; and its want of number muſt be ſupplied by ſome other ſwarm. Therefore, when, in the beginning of the ſpring, a numerous young brood has been hatched in that hive, the new King muſt be ſqueezed to death, that the multitude may continue to live with their parents without diſcord. But if the honey-combs ſhall have produced no progeny at all, you may bring the commonalty of two or three hives together into one; but they muſt be firſt ſprinkled with ſweet liquor: then afterwards you may ſhut them up, and, having placed meat for them, you may keep them ſhut up almoſt for the ſpace of three days, leaving ſmall breathing-places for them, till they accuſtom themſelves to converſe familiarly, and live together.

There are ſome who may rather chuſe to put the older King out of the way, which proves very hurtful; becauſe the more aged multitude, if he be put to death, muſt of neceſſity, like a number of old ſenators, obey thoſe that are younger than themſelves; and, if there be any of them that obſtinately deſpiſe the commands of thoſe that are ſtronger, they are puniſhed, and put to death.

Nevertheleſs this inconveniency uſually befals a younger ſwarm, when the King of the antienter bees, which was left by us, fails, and, through old age, becomes uncapable to govern, that the family falls into diſcord from too great licentiouſneſs, as if their Lord were dead. To which a remedy is eaſily applied: for out of thoſe hives, which have ſeveral kings, one General is choſen; and, being tranſlated to thoſe bees which are without any government, is conſtituted their ruler.

But the paucity of the bees may be remedied with leſs trouble, in thoſe domicils which labour under any peſtilential diſtemper: for after the havock and deſtruction of the hive, reduced to a ſmall number, is known, you muſt examine and view what honey-combs it has: then, afterwards, from the wax which contains the ſeeds of the young bees, you muſt cut away that part wherein the offspring of the royal kind is animated: for this is eaſy to be ſeen; becauſe, at the very end of the wax-works, there appears, as it were, the nipple of a pap riſing higher, and of a wider cavity than the reſt of the holes are of wherein the young bees of vulgar note are contained. *Celſus* indeed affirms, that, in the outmoſt honey-combs, there are tranſverſe pipes or cavities, which contain the young royal progeny. *Hyginus* alſo, following the authority of the *Greeks*, denies that the Captain-general is formed of a little worm or maggot (as the reſt of the bees are); but that in the circumference of the honey-combs there are found ſtraight holes, ſomewhat larger than thoſe of the *Plebeian* ſeed, filled, as it were, with a ſordid ſubſtance of a red colour, out of which the winged King is at firſt immediately formed.

CHAP. XII.

Of putting up a Swarm of Bees into their Hive, and hindering them from making their Eſcape.

THere is alſo that care which is to be taken of a ſwarm bred in our own bee-ſtall, if by chance they ſhould grow weary of, and abhor, their native country; and, by making an eruption at the foreſaid time, declare their intention of betaking themſelves by flight to a more diſtant habitation. And the hive gives intimation of this, when the bee ſo avoids the porch of her houſe, that not one of them

flies back to it, but preſently raiſes herſelf to a greater height. Let the youth that are making their eſcape be terrified with brazen timbrels, or rattles, or with the ſound of earthen veſſels, or tiles, which, for the moſt part, lie every-where: and when, after they are frightened, they either return to their maternal hive, and hang all in a clew in the entry to it, or preſently betake themſelves to the next green leavy bough; let the Keeper preſently rub and anoint all over a new hive, prepared for that purpoſe, with the foreſaid herbs: then having ſprinkled it with drops of honey, let him apply it to them; then, gathering the bees together, let him put them into it, either with his hands, or with a bowl: and after all other due care has been taken, and the vaſe has been carefully adjuſted and daubed over, let him ſuffer it, in the mean while, to remain in the ſame place, till it draws towards evening; then, in the beginning of the twilight, let him remove it thence, and place it in the row of the other hives. But it is neceſſary alſo to have empty houſes placed for them in the apiary: for there are ſome hives which, as ſoon as they come forth, preſently ſeek for a ſeat for themſelves in the neighbourhood, and take poſſeſſion of that which they find empty. This is almoſt a complete account of the care that is neceſſary both for acquiring and retaining of bees.

CHAP. XIII.

Of Remedies for Bees labouring under any Diſtemper.

THE next thing is to inquire after remedies for ſuch as labour under any diſtemper, or are afflicted with the peſtilence. The plague rarely proves deſtructive to bees: nevertheleſs I do not find that any other thing can be done, than that which we directed with reſpect to other ſorts of cattle, that the hives be removed to ſome diſtant place. But, in theſe, both the cauſes of their diſeaſes are more eaſily diſcerned, and their remedies found out. But their greateſt annual diſtemper is in the beginning of the ſpring, when the young ſprigs of *ſpurge* bloſſom, and the elms diſcloſe their ſeeds; for as with new apples, ſo they are allured with theſe primitive flowers; and they feed greedily upon them after their winter hunger, ſuch food being no otherwiſe hurtful to them but their eating of it to exceſs, with which having glutted themſelves, they die of a looſeneſs, unleſs

they have ſpeedy relief; for ſpurge gives a looſeneſs to other animals alſo, but elms particularly to bees: and this is the reaſon why bees ſeldom continue numerous in the regions of *Italy*, which are planted with trees of this kind. Therefore in the beginning of the ſpring, if you give them medicated food, by the ſame remedies you may both prevent their being afflicted with ſuch a plague, and they may be cured when they are ſeized with it.

For as to what *Hyginus*, who followed authors that lived before his time, has delivered, I myſelf dare not affirm it, not having made the experiment; nevertheleſs they who have a mind to it may try it. For he directs us about the time of the vernal equinox, when the clemency of the day invites, after the third hour, to bring forth, and expoſe to the Sun, the bodies of thoſe bees, which, when ſuch a plague has ſeized them, are found killed in heaps under the honey-combs, and have been laid up in a dry place during the winter, and to cover them over with fig-tree aſhes; which being done, he affirms, that, within two hours, being animated with the enlivening ſteam of the heat, and having reſumed their ſpirit, they will creep into an hive prepared for that purpoſe, if it be ſet before them. We rather, that they may not periſh, adviſe that ſuch things, as we ſhall hereafter preſcribe, be given to the hives when they are ſick: for either the kernels of the pomegranate bruiſed, and ſprinkled with *Aminean* wine, or raiſins of the Sun bruiſed in a mortar with *ros Syriacus* (1); (*Syrian* ſumach) in equal quantity, and well ſoaked in rough wine, ought to be given them; or, if theſe by themſelves have no effect, all theſe ſame things, an equal weight of each, being ſmoothed, and reduced into one maſs, and boiled with *Aminean* wine in an earthen veſſel, and afterward cooled, ought to be ſet before them in wooden troughs.

Some people make a decoction of roſemary and mead, and, after it is turned to a gelly, pour it into hollow tiles, and give it them to ſip. Some ſet ox's or human urine by the hives (as *Hyginus* affirms). Likewiſe that diſeaſe alſo is very remarkable, which conſumes them, and makes them ſhrink, and become ill-favoured; when ſome of

(1) *Ros Syriacus* is the *Rhus Græcorum*. *Pliny* ſays, that the *Romans* had no name for it, *lib.* XXIV. *cap.* 11. *plura Rhois nomina apud Galenum, modo Syriacum, modo Ponticum, modo Obſoniarum*, *Matthiolus* ſays, they are all of one ſort, and that there was no manner of difference in the trees; that the ſeed was uſed for ſeaſoning victuals, and the tanners made uſe of the leaves and ſprigs becauſe of their aſtringent quality; ſo that, it ſeems, they are miſtaken, who think, that *Ros Syriacus*, in *Columella* and *Celſus*, is a ſort of manna or dew that falls from the air; ſo that *Rhos*, which is a *Greek* word, muſt be the true reading. It is of an aſtringent quality, and preſcribed by our author as a remedy for bees, when they are troubled with a looſeneſs.

them

them frequently carry out of their houſes the bodies of thoſe that are dead, and others of them ſit dull and languiſhing within their houſes, in ſorrowful ſilence, as in a public mourning. When this happens, food poured into pipes, or troughs made of reeds, is offered them; eſpecially of well-boiled honey, and bruiſed with a gall, or a dry roſe. It is proper alſo to burn galbanum, that they may be cured with the ſmell of it; and, when they are wearied, to ſuſtain them with raiſins of the Sun, and old ſodden muſt: nevertheleſs the root of *amellus*, of which the ſtalk and ſprigs are yellowiſh, and the flower purple-coloured, does exceeding well; it is boiled with *Aminean* wine, and ſtrained, and ſo the diſſolved juice of it is given them.

Hyginus indeed, in the book he wrote of bees, ſays, that *Ariſtomachus* was of opinion, that relief ought to be given to ſuch of them as are ſick, in this manner: firſt, That all the vitiated honey-combs be taken away, and freſh food placed anew for them; and then that they be fumigated. He alſo thinks, that it does good to bees, waſted with old age, to add a new ſwarm to them, altho' they may be in danger of being conſumed by ſedition; nevertheleſs they will be glad when a multitude is joined to them. But, that they may live together in concord, the Kings of thoſe bees, which are tranſlated from another habitation, being, as it were, a foreign people, ought to be removed out of the way. Nevertheleſs there is no doubt, but that the honey-combs of very numerous ſwarms, which have young ones already formed in them, ought to be tranſlated, and ſubjected to thoſe ſwarms which are fewer in number, that ſo their houſes may be confirmed and eſtabliſhed by the adoption, as it were, of a new offſpring. But, whenever this ſhall be done, we muſt be mindful to put thoſe honey-combs under their care, whoſe young bees do already break open the places of their abode, and gnaw through the wax which was laid over them as covers to their holes, putting out their heads: for, if we tranſlate the honey-combs while the brood is not come to maturity, the young bees will die, when they ceaſe to be cheriſhed and kept warm.

Oft-times alſo they die of a diſeaſe, which the *Greeks* call φαγέδαινα (2): foraſmuch as this is an ordinary cuſtom with bees, to make as much wax-work at firſt as they think they ſhall be able to fill up; it ſometimes comes to paſs, that, after their wax-works are finiſhed,

(2) Φαγέδαινα. *Pliny, Hiſt. Naſt. lib.* xxvi. 11. tells us, that this word has two ſignification; either an eating ulcer, or a voracious appetite that cannot be ſatisfied, which the *Greeks* call βάλιμον. Probably our author took it in the firſt ſenſe, to denote ſome diſeaſe incident to bees.

the

the ſwarm, wandering at too great a diſtance, in order to ſearch for honey, is overwhelmed with ſudden ſhowers, or whirlwinds, in the woods, and loſes the greateſt part of the *Plebeians:* whenever this happens, the few that remain are not able to fill up the honey-combs; then thoſe parts of the wax-works which are empty rot, and diſeaſes creeping in by little and little, after the honey is corrupted, the bees themſelves periſh alſo. To prevent this, two different people ought to be united, which may be able to fill up the wax-works while they are yet ſound; or, if we have not another ſwarm fit for our purpoſe, we muſt, with a very ſharp knife, free the honey-combs from the empty parts before they begin to rot: for this alſo is of very great importance, that the iron tool be not very blunt, leſt, being preſſed in with greater force, (becauſe it does not eaſily penetrate) it move the honey-combs out of their places; for, if this be done, the bees forſake their habitation.

There is this cauſe alſo of their deſtruction, that ſometimes for ſeveral years following very many flowers come up, and the bees are more intent upon making honey than upon brooding. Therefore ſome who have leſs knowledge in theſe things, are delighted with a great produce, not knowing that the bees are upon the very brink of deſtruction; becauſe, being wearied with too much labour, very many of them periſh; and their numbers not being increaſed with new ſupplies of youth, at laſt the reſt die alſo. Therefore, if ſuch a ſpring ſhould happen, that both the meadows and the corn-lands ſhould abound in flowers, it will be of very great advantage, that all the paſſages of the hives, through which the bees go out, be ſhut up, leaving ſmall holes, through which they may not be able to go out, that ſo being withdrawn from their buſineſs of making honey, becauſe they have no hopes of filling up all their wax-works with liquors, they may fill them up with a young breed. And theſe are ordinarily the remedies of ſwarms of bees that labour under any diſtemper.

CHAP.

CHAP. XIV.

Of that which the Bees do at all Times, and what the Perſon that has the Care of them ought to do.

HERE follows next the care that is to be taken of them through the whole year, as the ſame *Hyginus* has deſcribed it, in a very eaſy and agreeable manner. From the firſt equinox, which happens about the twenty-fourth of *March* (1), in the eighth part of *Aries*, to the riſing of the *Pleiades* (2), there are reckoned forty-eight days of ſpring-time. He ſays, that the bees ought to be cured, for the firſt time, by opening their hives, that all the filth and naſtineſs, which has been gathered during the winter, may be taken out of them; and that after the ſpiders, which ſpoil the honey-combs, are pulled out, the ſmoak, made by kindling of ox's dung, may be conveyed into them; for this ſmoak, from a certain cognation or ſameneſs of parentage and extraction as it were, is very ſuitable and proper for bees. The little worms alſo, which are called *moths*, and the butterflies, muſt be killed: which peſts, adhering for the moſt part to the honey-combs, fall down from them, if you mix ox's marrow with the dung, and, having ſet them on fire, convey their burning ſmell to them: by this management, during the time which we have mentioned, the ſwarms will be ſtrengthened, and they will, with more courage and reſolution, apply themſelves to their buſineſs, and carry on their works.

(1) Although *Columella* was very well acquainted with the exact times of the riſing and ſetting of the ſtars, and of the equinoxes and ſolſtices, *&c.* yet, as he himſelf declares in this chapter, he rather choſe to follow the commonly received opinions, with which Husbandmen had been long acquainted, than to diſturb them with new computations: ſo that no perſon need be offended, when they hear him ſpeaking of the Sun's entering into ſuch and ſuch ſigns, and of the equinoxes and ſolſtices falling upon ſuch and ſuch days, when they really do not happen, ſince he only accommodated himſelf to the common way of reckoning at the time he wrote. Thus, in this chapter he ſays, that the firſt equinox, that is, the *vernal*, falls about the 24th of *March*; whereas, according to the computations of the beſt aſtronomers, it happens about the 10th day of the ſaid month, old ſtile.

(2) *Pleiades.* The cluſter of ſeven ſmall ſtars, in the neck of the Bull, are uſually thus called. Some ſay they are thus called, becauſe formerly they thought, that, when they began to riſe, they might ſafely go to ſea: others aſſign different reaſons of their name, which do not ſeem to be well founded. They were by the *Romans* called *vergiliæ*, becauſe they riſe in the ſpring.

But

But he who has the charge of them, and who nouriſhes the bees, muſt be exceeding careful, when he is going to handle the hives, that the day before he be chaſte, and pure from all venereal affairs; and, that he neither come to them when he is drunk, nor till ſuch time as he has waſhed himſelf; and that he abſtain almoſt from all eatables of a ſtrong diſagreeable ſmell, ſuch as ſalt-fiſh or fleſh, and all manner of pickle or gravy belonging to them: as alſo from garlick, onions, and other ſuch-like things, of ſtinking, acrimonious qualities. On the forty-eighth day from the vernal equinox, when the *Pleiades* ariſe about the eighth day of *May*, the ſwarms begin to increaſe, both in ſtrength and number: but, on the ſame days alſo, ſuch ſwarms as have few and ſick bees utterly periſh; and, at the ſame time, are generated, in the extremities of the honey-combs, young ones of a larger ſize than thoſe of other bees are; and ſome think, that they are Kings. But ſome of the *Greeks* call them οἶστρους (3), becauſe they vex and moleſt the ſwarms, and do not ſuffer them to reſt: therefore they command them to be killed.

From the riſing of the *Pleiades* to the ſolſtice, which falls in the latter end of the month of *June*, about the eighth part of *Cancer* (4), for the moſt part, the hives begin to ſwarm; at which time they ought to be watched very narrowly, leſt the young offſpring make their eſcape: and then, from the time that the ſolſtice is paſt, till the riſing of the *Dog-ſtar* (5), which are almoſt thirty days, the corns and the honey-combs are cut down together. But, after what manner theſe ought to be taken away, we ſhall afterwards direct, when we come to give directions concerning the making of honey.

But *Democritus*, and *Mago*, and *Virgil* alſo, have reported, that bees may, at this ſame time, be generated or produced from a ſlain bullock. *Mago* indeed affirms, that the ſame may be alſo done from the bellies of oxen; which method of production I think it needleſs to pro-

(3) Οἶστρος, *aſtrus*, a gad-bee, or a horſe- or ox-fly, by *Homer* called αἰολος οἶστρος, perhaps from its ſpots. *Columella* does not mean, that theſe larger bees, which are generated in the extremities of the honey-combs, are properly gad-bees; but that they were ſo called, becauſe of their miſchievous qualities of tormenting the bees, as the gad-bees do oxen.

(4) The Sun enters the tropic of *Cancer* about the 11th of *June*, being then arrived at his utmoſt northern declination, making the longeſt day, and the ſhorteſt night, in north latitude; and then is the ſummer ſolſtice, when the Sun appears to ſtop his courſe northward, and returns back again towards the equator.

(5) *Canicula*, the *Dog-ſtar*, is a bright ſtar of the firſt magnitude, in the mouth of *Canis major*; which, as ſome ſay, riſing with the Sun about the 24th of *July*, and ſetting about the 28th of *Auguſt*, gives occaſion to that time, which is uſually very hot and dry, to be called the *Canicular*, or Dog-days. This ſtar was by the *Greeks* called *Sirius*, becauſe of its ſcorching and drying influence.

ſecute more carefully, being of the ſame mind with *Celſus*, who ſays very prudently, that this ſort of cattle is never loſt with ſo great a deſtruction, as to make it neceſſary to ſeek to recover them in ſuch a manner. But during this time, and always till the autumnal equinox, the hives muſt be opened, and fumigated, every tenth day; which, tho' it be troubleſome to the hives, yet it is agreed, that it is exceeding wholſome. Then you muſt cool and refreſh the bees after they have been fumigated, and are all in an heat, by ſprinkling the empty parts of the hives, and pouring the coldeſt new-drawn water into them: then, if there be any thing that cannot be waſhed away, it muſt be cleaned with the pinions of an eagle, or of any other huge fowl alſo, which have a ſtiffneſs in them.

Moreover you muſt take care, that, if any moths appear, they be ſwept out of the hives; and that the butterflies be killed, which commonly, abiding among the hives, are deſtructive to the bees: for they both gnaw into and conſume the wax, and with their dung breed worms, which we call hive-moths. Therefore, at the time when the mallows bloſſom, when there is the greateſt multitude of theſe butterflies, if an high brazen veſſel, with a narrow neck like the mile-column (6), be placed in the evening among the bee-hives, and ſome light put down to the bottom of it, the butterflies gather together to it from all places; and, while they flutter about the ſmall flame, they are ſcorched, becauſe they can neither fly eaſily upward out of the narrow place, nor, on the other hand, can they retire at a greater diſtance from the fire, ſince they are ſurrounded by the ſides of the brazen veſſel: therefore they are conſumed by the burning heat that is near them. Almoſt after the fiftieth day from the riſing of the Dog-ſtar, *Arcturus* riſeth (7), when the bees make their honeys from the dewy flowers of thyme, and *Italian* and *Greek* ſavory; and this honey, which is of the beſt ſort, appears in all its luſtre and beauty at the autumnal equinox, which is before the firſt of *October*, when the Sun is juſt arrived at the eighth part of *Libra*. But great care muſt be taken, between the riſing of the Dog-ſtar, and that of

(6) *Simile miliario.* It is manifeſt from *Palladius*, *lib.* v. *tit.* 8. that this veſſel was high and narrow, ſuch as they uſed in baths for warming water; but what the author means by directing it to be made *ſimile miliario*, is not ſo eaſy to determine. It is probable he means, that it ſhould be ſhaped like the ſtones which marked the miles, which were long and narrow towards the top, or like the column which was erected in the *forum*, to mark the place from whence they began to count their miles: other reaſons are aſſigned, which are not ſatisfying.

(7) *Arcturus*, a fixed ſtar of the firſt magnitude, placed in the skirt, or, as others expreſs it, between the knees, of *Arctophylax*, a conſtellation in the northern hemiſphere, otherwiſe called *Bootes*.

Arcturus, that the bees be not ſurpriſed and intercepted by the fury and violence of waſps, which, for the moſt part, lie in wait before the doors of the hives, and watch for their coming out.

After the riſing of *Arcturus*, about the time of the equinox, when the Sun is in *Libra*, (as I ſaid) is the ſecond taking out of the honey-combs. Then from the time of the equinox, which falls about the twenty-fourth of September, to the ſetting of the *Pleiades*, for the ſpace of forty days, the bees lay up for their winter proviſion the honeys they have gathered from tamariſk-flowers, and ſhrubs which grow in thickets and woods; from which nothing at all muſt be taken away, leſt, being diſheartened by repeated injuries, they ſhould, through deſpair, as it were, of retrieving their affairs, run away, and forſake all.

From the ſetting of the *Pleiades* to the winter ſolſtice, which happens almoſt about the twenty-third of *December*, in the eighth part of *Capricorn* (8), the hives then make uſe of the honey which they laid up in ſtore, and with it they are nouriſhed and ſupported till the riſing of *Arcturus*. Nor am I ignorant of *Hipparchus*'s computation, which teaches, that the ſolſtices and the equinoxes do not happen in the eighth, but in the firſt parts of the ſigns. But, in this rural diſcipline, I now follow the calendars of *Eudoxus* and *Meton* (9), and thoſe of the antient Aſtronomers, which are adapted to the public ſacrifices; becauſe Huſbandmen are both better acquainted with that old opinion which has been commonly entertained: nor, yet, is the niceneſs and exactneſs of *Hipparchus* neceſſary, to the groſſer apprehenſions, and ſcanty learning, of Huſbandmen. Therefore, at the firſt ſetting of the *Pleiades*, it will be proper to open the hives preſently, and to cleanſe them from all manner of filth and uncleanneſs, and to cure them the more carefully, becauſe in the winter-time it is not expedient to move, or lay open, the vaſes: for which reaſon, while there is yet any part of the autumn remaining, after you have cleanſed their domicils in a very bright ſun-ſhining day, the covers muſt be put in the inſide, cloſe to the honey-combs, all the empty part of their ſeat being excluded, that ſo, their cages being reduced to a narrower compaſs, they may the more eaſily gather heat during the

(8) The Sun makes his entrance into *Capricorn* the 11th of *December*, and then is the winter ſolſtice, when he is got fartheſt from the equator; and, in northern regions, the nights are at the longeſt, and the days at the ſhorteſt.

(9) *Eudoxus* and *Meton*, both mentioned in the preface to the firſt book; and *Hipparchus*, in the firſt chapter of the firſt book: this laſt was of *Nicea* in *Bithynia*, according to *Suidas*, and the moſt renowned Aſtronomer of his age: he flouriſhed about 120 years before the Chriſtian æra.

winter.

winter. And this muſt always be done, even in thoſe hives, which, by reaſon of the fewneſs of the common people, are but thinly inhabited.

Moreover, whatever chinks or holes there are in them, we muſt dawb them on the outſide with clay and ox's dung mixed together, and leave nothing but the entries for them to go out and come in by. And, altho' the vaſes be protected by a portico, nevertheleſs we muſt cover them over with ſtraw and leaves put cloſe together, and ſecure them from cold and ſtorms, as much as the thing will bear. Some kill fowls, and, after they have taken out their entrails, ſhut them up in the hives; and they afford a gentle heat to the bees, which lurk in their feathers in the winter-time: as alſo, if their proviſions are ſpent, they feed commodiouſly upon them when they are hungry, and leave nothing but their bones. But, if the honey-combs are ſufficient for them, the fowls remain intire; nor do they offend the bees with their ſmell, altho' they love cleanlineſs exceedingly. Nevertheleſs we think it better, in the winter-time, when they are in diſtreſs with hunger, to give them, in little troughs at the very entry of their hives, either dry figs bruiſed and moiſtened in water, or rob of grapes, (*muſt boiled in to a third part*) or raiſin wine; with which liquors you muſt moiſten and imbue clean wool, that the bees, ſtanding upon it, may draw up the juice, as it were, through a ſiphon. It will alſo be very proper to give them raiſins of the ſun, ſprinkled a little with water, after we have broken them. And with theſe ſorts of food they muſt be ſupported, not only in winter, but alſo at ſuch times (as I ſaid before) as the ſpurge, and alſo the elm-trees, bloſſom.

After the ſhorteſt day of winter is paſt, they conſume almoſt, in forty days, all the honey that was laid up in ſtore for them (unleſs a more liberal allowance was left them by their Overſeer); and oft-times alſo, after they have emptied their wax-works, they lie in the honey-combs faſting, and benumbed, without motion, in the manner of ſerpents, till the riſing of *Arcturus*, which is about the thirteenth of *February*, and by their reſt preſerve their life: nevertheleſs, that they may not loſe it, if a longer famine aſſaults them, it is beſt to put into the hives, through the entrance of the porch, ſweet juices or gellies in tubes, and ſo ſuſtain them during the ſcarcity of the times, till the riſing of *Arcturus*, and the coming of the ſwallow, promiſe that the enſuing weather will be more favourable. Therefore after that time, when the chearfulneſs of the day permits, they have the courage to go out to the paſtures: for after the vernal Equinox,

without any delay, they wander up and down every-where, and pluck the flowers that are fit for the production of their young ones, and carry them home to their houſes.

Theſe things *Hyginus* commands to be moſt carefully obſerved through all the ſeaſons of the year: but *Celſus* adds to them the following things, that few places have the happineſs of being in a condition to afford one ſort of food for bees in winter, and another in ſummer; therefore he denies, that, in thoſe places where flowers, that are proper for them, fail, after the ſpring of the year is paſt, the hives ought to be left without moving them; but that, after the vernal paſtures are conſumed, they ought to be tranſlated into thoſe places which can nouriſh the bees more liberally with the lateward flowers of thyme, baſtard marjoram, and *Greek* ſavory, which, he ſays, is practiſed both in the regions of *Achaia*, where they are tranſlated into the *Attican* paſtures, and in *Eubœa* (10), and the *Cyclad* iſlands, where they are tranſported out of the other iſlands into *Scyrus*, as alſo in *Sicily*, when they are brought to *Hybla* out of other parts of the country. The ſame author ſays, that the wax-works are make of flowers, and the honey of the morning dew, which aſſumes ſo much the better quality, the ſweeter the materials are, of which the wax is compounded. But he directs us to look carefully into the hives, before they are removed from one place to another; and to take out the honey-combs that are old, and full of moths, and ready to drop down; and to reſerve only a few of them, and of the beſt ſort, that ſo as many of them as can be, may be made, at the ſame time, of the beſt flowers; and that ſuch vaſes, as any one has a mind to remove, be carried only in the night-time, and without ſhaking them.

CHAP. XV.

Of the Making of Honey, and of the Time when the Hives ought to be caſtrated.

PReſently after the ſpring is paſt, follows, as I ſaid, the time for gathering in and making the honey; for which the labour of the whole year is employed. We underſtand, that the honey is ripe

(10) *Eubœa*, now called by many writers *Negroponte*, an iſland upon the coaſt of *Achaia*; and *Scyros*, an iſland in the *Ægæan* ſea, about 28 miles diſtant from it; and the *Cyclad* iſlands, in the ſame ſea, have been already mentioned.

for

for gathering, when we obſerve the bees expelling and driving away the drones, which is a kind of animal of a larger growth, and very like a bee, and, as *Virgil* ſays, *an idle ſluggiſh cattle*, and, that ſits conſtantly by the honey-combs, without any induſtry: for they do not gather any proviſions themſelves, and conſume thoſe that are brought in by others. Nevertheleſs theſe drones ſeem to contribute ſomething towards the procreation of the young generation, they ſitting upon thoſe ſeeds, of which the bees are formed: therefore they are admitted into greater familiarity, in order to hatch, cheriſh, and educate the new offſpring; but, after the young bees are hatched, they are thruſt out of the houſes by force, and, as the ſame poet ſays, *driven from the mangers*. Some order them to be intirely exterminated; but I am of *Mago*'s opinion, and think that this ought not to be done, but that bounds ought to be ſet to cruelty; for the whole race ought not to be utterly deſtroyed, leſt the bees be infected with ſloth and idleneſs, which, when the drones conſume a part of their proviſions, become more nimble and active in repairing their loſſes: nor, on the other hand, muſt we ſuffer a multitude of robbers to grow ſtrong, and form themſelves into a body, leſt they pillage and deſtroy all the wealth and riches belonging to others. Therefore, when you ſee the bees and the drones frequently quarrelling with one another, you muſt open the hives, and look into them, that if the honey-combs be half-full, they may be deferred, and let alone, for ſome time; or, if they are already full of liquor, and all daubed over with wax, as it were, with covers placed upon them, they may be cut down.

But we muſt ſeize upon almoſt the morning of the day for caſtrating the hives; for, it is not proper that the bees, which are already exaſperated, ſhould be provoked in the middle of the heat of the day. Two iron-tools are neceſſary for this uſe, made of the meaſure of one foot and an half, or a little larger; of which, let one be an oblong knife, with a broad edge on both ſides, having a crooked ſcraper or bill for paring on one ſide; let the other be plain, and very ſharp on the forepart; that by this the honey-combs may be the better cut down, and by that other ſcraped off; and whatever filth falls down from them, may be drawn towards you: but where the bee-hive has no open porch on the backſide, we muſt convey into it ſmoak made with galbanum, or dry dung. Moreover, theſe you muſt put up into an earthen veſſel, mixed with live-coals; and this veſſel is made with handles, and ſhaped like a ſtrait narrow pot, ſo as one part of it may be ſharper, or draw towards a point, by which the

ſmoak

ſmoak may iſſue out at a ſmall hole; the other part broader, and with a wide mouth, by which the coals may be blown. When ſuch a pot is applied to the hive, by blowing into it, the ſmoak is conveyed to the bees, which, not being able to endure the burning ſmell, preſently betake themſelves to the forepart of their domicil, and ſometires retire without the porch.

And, when you have made way for looking more freely into the hives, if there be two ſwarms of bees, for the moſt part there are alſo two kinds of honey-combs found in them: for, even when they live in concord together, each commonalty obſerves its own cuſtom and manner of ſhaping and faſhioning their wax-works. But all honey-combs do always hang down from the roofs of the hives, and adhering a very little to the ſides, ſo as not to touch the bottom, becauſe that affords a way for the ſwarms to go and come by. But the figure of the wax-works is ſuch as the ſhape or make of the hive is; for both the ſquare and round ſpaces, and alſo ſuch as are long, give their own ſhape, as if they were certain moulds, to the honey-combs; therefore the honey-combs are not always found of the ſame figure. But, whatever form they may be of, let them not be all taken out: for, at the gathering of the firſt crop, while the fields do yet abound in paſture, the fifth part of them muſt be left; and, at the latter crop, when now we are under apprehenſions of the winter, the third part muſt be left. And, yet, this is not a certain meaſure in all countries; becauſe due regard muſt be had for the bees, and proviſion left for them, in proportion to the multitude of flowers, and the plenty of food, they have. But, if the dependent wax-works run out in length, the honey-combs muſt be cut with that iron-tool, which is like to a knife; and then they muſt be received by putting your two arms under them, and ſo brought out: but, if they run croſs-wiſe, and ſtick to the roofs of the hives, then there is occaſion for the iron-tool, made with the paring-knife on the ſide of it, that, thruſting it into them, they may be cut down with the forepart of the tool turned towards you. But ſuch of them as are old, or ſpoiled, ought to be taken out, and thoſe that are the ſoundeſt, and full of honey, left; and, finally, if there be any of them that contain young bees, that they be reſerved, in order to form a new ſwarm.

Then your whole ſtore of honey-combs muſt be brought together into that place, wherein you reſolve to make the honey; and the holes of the walls and windows muſt be carefully daubed over, and filled up, that there may be no place for the bees to paſs through, which eagerly ſearch after their loſt goods, as it were, and, having

traced them, and found them out, conſume them: therefore a ſmoak muſt be made, of the ſame materials, in the entrance of the place alſo, which may repell ſuch of them as attempt to come in. Then, if any of the hives, that are caſtrated, ſhall have honey-combs that lie croſs the entry, they muſt be turned, that ſo the hinder-parts may, by turns, becomes the porches or entries: for ſo the next time they are caſtrated, the old honey-combs ſhall rather be taken away than the new, and the wax-works will be renewed, which by how much the older, by ſo much the worſe they are. But if peradventure the hives are ſurrounded, and incloſed with a wall, and are immoveable, we muſt take care, that they be caſtrated at one time in the hinder-part, and in the forepart at another time: and this ought to be done before the fifth hour of the day, and then repeated, either after the ninth hour, or the morning following.

But how many honey-combs ſoever are cut down, it is proper to make the honey the ſame day, while they are warm. A willow baſket, or a ſack woven pretty thin with oſiers, like an inverted cone, ſuch as that wherewith wine is racked or ſtrained, is hung up in a dark place; then the honey-combs are gathered into it one by one, as they are taken out. But care muſt be taken, that thoſe parts of their wax-works, which either have young bees, or red ſordid matter in them, be ſeparated from them: for they are of a bad taſte, and ſpoil the honey with their juice. Then, when the ſtrained honey has flowed into a tub ſet under it to receive it, it is transferred into earthen veſſels, which are left open for a few days, till the new honey leave off fermenting; and it muſt be frequently ſcummed with a ladle or ſcummer. Then preſently afterwards the fragments of honey-combs, which have remained in the ſack, are dreſſed and handled afreſh, and the juice ſqueezed out of them; and the honey that flows from them is of a ſecondary ſort, and, by perſons that are more exact and careful in their affairs, is laid up apart by itſelf, leſt that which is of the moſt exquiſite taſte, by adding this to it, ſhould become worſe.

CHAP. XVI.

Of the Making of Wax.

THE crop of wax, tho' it amounts to very little money, is nevertheleſs not to be neglected, inaſmuch as the uſe of it is neceſſary for many things. The remains of the honey-combs, when the

the honey is ſqueezed out of them, after they are carefully waſhed with ſweet water, are thrown all together into a brazen veſſel: then water being put to them, they are melted upon a good fire: and, when this is done, the wax is poured out, and ſtrained through ſtraw or ruſhes, and then boiled over-again in the ſame manner as before, and poured out into ſuch moulds as every one thinks moſt proper, water being firſt put into them: and it is eaſy to take it out of the moulds after it is congealed and hardened, becauſe the moiſture that is under it does not ſuffer it to ſtick to the moulds. But now having finiſhed my diſſertation upon cattle, that are kept in or about the manor-houſe, and the ſeveral ways of paſturing the ſame, that part of Huſbandry, which yet remains to be treated of, *viz. the culture of gardens*, I ſhall next put into verſe, as both you, *Publius Silvinus*, and our friend *Gallio*, have been pleaſed to require.

L. JUNIUS

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK TENTH.

Of the Culture of Gardens.

The PREFACE.

RECEIVE, O *Silvinus*, the remaining ſmall payment of your uſury, which you demanded, and I engaged to pay you: for, with the nine former books I payed what I owed, except this part only, which I now fully pay. There remains, therefore, the culture of gardens, notably neglected formerly by antient Huſbandmen, but now in very great requeſt. Tho' it is true, indeed, that, among the antients, there was greater parſimony and frugality, nevertheleſs the poor were wont to fare better, and to be frequently admitted to public feaſts; the higheſt and the loweſt ſuſtaining themſelves with, and living upon, plenty of milk, veniſon, and fleſh of tame cattle alſo, juſt in the ſame manner as they did upon corn and water: but afterwards, when the following age, and eſpecially our own, did ſet a mighty value upon dainty diſhes, invented for promoting luſt and wantonneſs, and ſuppers were eſtimated, not by mens natural wants and neceſſities, but by the value of their eſtates, and yearly income, *Plebeian* poverty was removed from the more coſtly and delicate viands, and forced to betake itſelf to common and ordinary fare.

Wherefore we muſt be more careful and diligent, than our anceſtors were, in delivering precepts and directions for the cultivation of gardens, becauſe the fruit of them is now more in uſe; and I would have ſubjoined them in proſe to the preceding books, as I had reſolved, unleſs your frequent and earneſt demand had overcome my purpoſe,

poſe, and prevailed with me to fill up, with poetical numbers, thoſe parts of the *Georgic* poem, which were omitted, and which even *Virgil* himſelf intimated, that he left to be treated of by thoſe that ſhould come after him. And, indeed, we would not have dared to attempt that any otherwiſe, but at the deſire and command of that poet, who is worthy of the greateſt veneration and honour, by whoſe divine inſtigation and authority, as it were, (ſlowly without doubt, becauſe of the difficulty of the work, nevertheleſs not without hope of proſperous ſucceſs) we have undertaken a very ſlender and lean ſubject, and almoſt intirely deſtitute of a body, which is ſo very ſmall and inconſiderable, that, in the conſummation indeed of the whole work, it may be reckoned and conſidered as a particle of our labour; but by itſelf, and confined, as it were, within its own bounds, it can by no means be put into ſuch a dreſs, as to make any graceful appearance. For altho' it has many members, as it were, of which we may be able to ſay ſomething; nevertheleſs they are ſo very ſmall, that (as the *Greeks* ſay) *of the incomprehenſible ſmalneſs of ſand a rope cannot be made* (1). Wherefore, whatever it is that our elucubrations have produced upon this ſubject, it is ſo far from laying claim to any commendations peculiar to itſelf, that it will be very well ſatisfied, if it be no diſgrace to the things which I have formerly written and publiſhed. But now let us leave off prefacing.

THEE likewiſe, O *Silvinus*, I will teach
The culture of thy gardens, and thoſe things
Which *Virgil* (2), in too narrow bounds confin'd,
Unfiniſh'd left, by us to be ſupply'd;
When of the fruitful fields, the plenteous crops,
The gifts of *Bacchus*, and celeſtial honey,
And, *O great Pales!* thee, likewiſe, he ſung:
Firſt, to thy num'rous garden (3) let fat land

(1) This *Greek* proverb, ἐξ ἄμμου σχοινίον πλέκεις, *you plait a rope of ſand*, is applicable to ſuch as undertake impoſſibilities.

(2) *Virgil*, in his 4th book of *Georgics*, *l.* 146. ſays, that, if he had had time, he would have ſung alſo of gardening, of which he has given a moſt beautiful ſketch, and touched a little upon the pleaſures and advantages of it in his deſcription of the *Coryrian* old man; which ſhews how lovely a performance it would have been, if he had purſued it; but he left it to the care of future poets. *Columella*, his great admirer, in obedience to him, as he ſays, attempted it. How far he has ſucceeded, or whether, in any part of his performance, he has come up to the beauty of *Virgil*'s ſhort ſketch, all they who underſtand the original will judge for themſelves.

(3) *Numeroſo horto*. This epithet is given to the garden, becauſe of the vaſt variety of plants, ſhrubs, *&c.* in it; or it may ſignify *large* and *ſpacious*, with a vaſt many beds and borders.

Afford a ſeat, whoſe looſe and crumbling glebe,
And open ſurface, to the piercing ſpade
Yields freely; which, when digg'd, reſembles ſand.
Fit is the nature of that ſoil, which graſs
In great abundance brings; or moiſt'ned well,
Dwarf-elder's ruddy berries, bright like gold,
Produces: for I neither love the dry,
Nor that where water ſtagnates, and doth form
A marſh; and which, of the complaining frog,
The curſes and reproaches ſtill endures (4).
That ſoil is alſo good, which leavy elms
Spontaneous educates, and is made glad
With branches of wild vines, or rough with woods
Of wild pear-tree (5), or with the ſtony fruits
Of plum-trees overſpread, or ſtrew'd with fruits
Which uncommanded apple-trees produce;
But bears no hellebores, nor galbanum (6),
With noxious juice; nor yew-tree doth endure,
Nor pungent poiſons ſweats, altho' it may
The mournful hemlock (7), and the mandrake's flow'rs (8),
Produce, whoſe root ſhews half a man, whoſe juice
With madneſs ſtrikes; it may likewiſe bring forth
The fennel-giant (9), which to ſchool-boys hands
No pity ſhews; and brambles, to the legs

(4) The poet here alludes to the fable of *Latona*, who transformed the *boors* into frogs, becauſe they refuſed to let her drink out of a pond of clear water, which they had cleared of weeds; of which we have an account in *Ovid. Metamorph.* fab. 9.

(5) *Achrados. Pyri ſilveſtris. Columella* retains the *Greek* name and termination. *Dioſcorides* ſays, *lib.* i. that it is a kind of wild pear-tree, whoſe fruit ripens very late; and that it has a more ſtyptic quality than the pear-tree.

(6) *Galbanum*, a gum that iſſues out of a ſpecies of fennel-giant. *Pliny* ſays, that the mountain *Amanus* in *Syria* yields it. It is the juice of a ferulaceous tree or plant, and from the juice dropping out of it the tree is called *ſtagonitis*.

(7) *Cicuta*, hemlock. *Pliny*, in the book and chapter above-mentioned, ſays it was *publica Athenienſium inviſa pœna*; they put their ſtate-priſoners and other criminals frequently to death with it; for which reaſon, I ſuppoſe, our poet calls it *maſta cicuta*.

(8) *Mandragora*, a mandrake. *Plin. Nat. Hiſt. lib.* xxv. *cap.* 13. gives a large deſcription of it; and altho' he mentions ſome of its hurtful effects, yet I don't obſerve, that he mentions its cauſing madneſs; neither, if I miſtake not, does he take any notice, in deſcribing the roots of it, of their reſembling the lower parts of the human body. The ingenious Mr. *Miller* ſays, that all this is fable; tho' *Pliny* takes notice of the danger of taking up its roots. Perhaps it may be either a different herb from what we call by that name; or, in very hot countries, it may have different qualities from what it has here.

(9) *Ferula*, fennel-giant: the rods of it were the inſtruments of ſchool-diſcipline.

Unkind, or Chriſt's-thorn with ſharp prickles arm'd.
Likewiſe let near this ground ſome rivers flow,
Whoſe ſtreams the hardy gard'ner may attract
To help to quench his garden's conſtant thirſt.
Or let ſome gentle ſpring into a well
Diſtil, not ſunk too deep, leſt too much toil
The drawer's panting ſides ſhould over-ſtretch.
And let ſuch ground with walls, or prickly hedge,
Thick-ſet, ſurrounded be, and well ſecur'd;
Not pervious to the cattle, nor the thief.
Search not for gifts of the *Dædalian* hand (10),
Nor thoſe of *Polyclete* (11); nor ſtatues carv'd
By *Phradmon*'s curious art, or *Agelad'*.
But chuſe the trunk of ſome huge antient tree;
Rough-hue it, uſe no art; *Priapus* (12) make
With frightful members, of enormous ſize;
Him, in the middle of thy garden, place,
And to him, as its guardian, homage pay,
That with his monſtrous parts he may deter
The plund'ring boy; and with his threat'ning ſcythe,
The robber from intended rapine keep.
Come now, *Pierian Muſes* (13), and ſpin out,

In

(10) *Dædalus*, a famous ſtatuary of *Sicyon*; he lived in the days of *Minos*: he was the inventor of many uſeful things in life, as the ſaw, the ax, the plumbet, the auger, glue, cement, ſails for ſhips, *&c. Plin. Nat. Hiſt. lib.* vii. *cap.* 56. Some ſay he was an *Athenian*, and the firſt ſtatuary who ſeparated the legs of ſtatues, they being united and joined before his time. All curious pieces of workmanſhip are from him called *Dedalian*; ſo that our author only means curious ſtatues, by whatever hand they were made.

(11) *Polycletus*, *Phradmon*, *Agelades*, three famous ſtatuaries, who flouriſhed about the 87th olympiad. *Polycletus* was ſcholar to *Agelades*, who, by *Pauſanias*, is called. Πολύκλειτος· both he and *Pliny* make frequent mention of them, and of many of their pieces.

(12) The antients put their gardens under the protection of *Priapus*, whom they called the ſon of *Dionyſius* and *Venus*. He is ſaid to have been of *Lampſacus* in the *Helleſpont*; ſo *Virgil* calls him *Priapus Helleſpontiacus*: *Columella* calls him *Ithyphallus*, *ob pudendi erectam formam*. It ſeems the antients ſet him over their gardens as a ſymbol of fruitfulneſs. Both *Virgil*, *Horace*, *Ovid*, and *Tibullus*, make mention of him as the keeper of gardens, or a ſcarecrow to thieves and fowls.

(13) Our author, as all other poets, antient and modern, invokes and implores the aſſiſtance of the *Muſes*, a ſet of fictitious deities, which were called *Pierides* or *Pieriæ*, from mount *Pierus* in *Theſſaly*, as *Feſtus* and *Cicero* ſay. Some affirm, that *Pieria* was a mountain in *Thracia*, where *Orpheus* lived: others, that it was a mountain in *Macedonia*, where the *Muſes* were born, which mountain, they ſay, touched upon *Thracia*; and ſome ſay, that the foundation of this fiction was, becauſe *Orpheus*, the firſt wiſe man, poet, and divine among the *Greeks*, went and made his abode in theſe places. *Ovid* and others give

In ſlender verſe, the culture, and the times,
Of ſowing every ſeed; the *care*, when ſown;
Beneath what ſtar fair flow'rs firſt ſhew their heads,
And *Peſtum*'s roſe-beds (14) firſt begin to bud;
And *Bacchus*' genuine plants, or other trees,
Mild by ingraftment on a borrow'd ſtock,
Bend with the burden of adopted fruits.
Now, when the thirſty *Dog-ſtar* ſhall have drank
Full draughts of *Ocean*'s ſtreams; and when his orb
With equal hours bright *Titan* ſhall have pois'd,
And *Autumn*, glutted with all ſorts of fruit,
Shaking his hoary head, with apples deck'd,
And all his garments wet and ſtain'd with muſt,
Shall from ripe grapes the foaming liquor ſqueeze;
Then let the lovely ground, with ſtrength of ſpades
Well arm'd with iron, be turned up-ſide-down,
If delv'd before, and moiſt'ned with the rains.
But if, with burning heat, and ſky ſerene,
Made hard, it without culture ſtill remains,
Then let commanded brooks, and cooling ſprings,
In ſloping paths deſcend; that ſo the earth
May drink, and therewith fill her gaping mouth.
But if no moiſture from the clouds your fields
Derive, nor in themſelves the ſame contain;
If nature of the place, or heav'n itſelf,
With-holds the ſhow'rs; then wait till winter come,
Till in the ſea's green waves, the ſparkling *Crown*,
The gift of *Bacchus* to his *Gnoſian* bride (15),
By turning of the world's poles be hid,

give us different reaſons why they were ſo called: if any have a mind to know their ſeveral names and offices, they may conſult the *Greek* epigrams, and ſome poems attributed to *Virgil*, where they may ſatisfy themſelves.

(14) *Pæſtum*, a town of *Lucania* in the kingdom of *Naples*, between *Salerno* and *Velia*. *Pliny* ſays, that the *Greeks* called it *Poſidonia*, which is the reaſon why *Velleius* calls it *Neptunia*: the gulph near it was called *Sinus Pæſtanus*, now called the *Gulph of Salerno*. This place was very much celebrated for its roſes, which flouriſhed twice a year, in *May* and *September*. *Virgil* commends *biferi roſaria Pæſti*.

(15) Theſe lines allude to the ſtory of *Bacchus*' marrying *Ariadne*, daughter of *Minos* king of *Crete*, at *Cnoſſus* in *Crete*; and his making her a preſent of a crown, which afterwards, to preſerve her memory, he tranſlated into the heavens, of which was formed a conſtellation, called *Corona borealis*, or *Corona Cnoſſia* or *Gnoſia*, or *Ariadnæ Corona*, &c.

And *Atlas'* loving daughters (16), ſtruck with fear,
Shun of the riſing ſun the adverſe rays.
And now when *Phœbus* (17) in ſome parts of heav'n
Does not confide, nor think himſelf ſecure,
But from the *Scorpion's* claws and deadly ſting
Flees trembling, and on *Crotus'* horſe-like back
Makes haſte the threat'ning danger to eſcape,
Ye vulgar, unacquainted with your race (18),
Her ſpare not, whom, deceiv'd, you falſly call
Your mother; ſhe, who of *Promethean* clay
Was form'd, is mother of a diff'rent race,
Not yours: another parent brought us forth,
When unrelenting *Neptune* with the ſea
O'erwhelm'd the earth, and ſhook the loweſt pit
Of hell, and *Lethe's* ſtreams with terror ſtruck.
Then, firſt, th' infernal hoſts, the *Stygian* king
Saw, with his trembling joints, betray his fear,
When, with the Ocean's weight, departed ſouls
Oppreſs'd, complained, and an uproar made.
Us, when this globe of mortals was bereft,
A fruitful hand did form; *Us* ragged rocks,
Torn by *Deucalion's* hands from lofty hills,
Brought forth. But lo! an harder toil us calls,

(16) *Atlantides* were the daughters of *Atlas*, a certain King of *Mauritania*, as ſome ſay, who was a great aſtronomer; they were fifteen in number, and, as the poet tells us, were tranſlated into the heavens, and converted into ſtars; and they fanſy, that ſome of them are the cluſter of ſmall ſtars in the neck of the *Bull*, called *Pleiades*, which have been already mentioned; and that others of them are the five ſtars in the *Bull's* face, by the *Greeks* called *Hyades*, becauſe they imagined they were the cauſe of rain: theſe, by the *Romans*, were called *Suculæ*, from a wrong interpretation of the *Greek* name, they being, at that time, it ſeems, very little acquainted either with the *Greek* learning or language.

(17) Here *Columella* deſcribes, poetically enough, the Sun's retiring from the ſign *Scorpio* to that of *Sagittarius*, in the month of *November*; and, becauſe of the ſhortening of the day, he is ſaid to fly away upon the back of *Crotus*, who, as the mythologiſts ſay, was tranſformed into this conſtellation at the prayer of the *Muſes*, with whom he had lived familiarly, being ſon to their nurſe *Eupheme*. They paint him half a man, and half an horſe, and put a bow and arrow into his hands, he being an excellent hunter and archer.

(18) Here the poet addreſſes himſelf to Husbandmen; and tells them, that they need not be afraid to dig the earth, from a vain apprehenſion of tearing out their mother's bowels; for, ſays he, you are not of that race of mankind which *Prometheus* formed of clay; theſe all periſhed by *Deucalion's* flood; you are of another race of mortals; you were not formed out of the earth, but made of ſtones, which *Deucalion* and *Pyrrha* threw behind their back.

A never-ceaſing labour: rouſe, awake,
Ye drowſy ſluggards, riſe, drive ſleep away,
Now come, and with the plough-ſhare's crooked tooth
Her green hairs tear, now her green garments cut;
With pond'rous rakes pierce her unyielding back;
And fear not, with large mattocks, to pull out
Her entrails, and them mix with th' upmoſt turf,
And place them to be pinched with hoar-froſts,
To frozen ſcourges, and the wrath expos'd
Of north-weſt winds; and let the fierce north wind
Them bind, and let the eaſtern wind unbind.
But, as ſoon as white *Zephyr* (19), with his gale
Warm'd with the Sun, the numbing colds and froſts
Of the *Riphæan* winter (20) ſhall have thaw'd;
And *Orpheus'* *Lyre* (1) ſhall from the ſtarry pole
Retire, and plunge itſelf into the deep;
And ſwallows (2) in their neſts the ſpring's advent
Shall chant; then let the Kitchen-gard'ner bring
Himſelf full baſkets yielding with the weight,
And with fat rubbiſh, or the ſolid dung
Of aſſes, or with that of other herds,
Feed to the full the hungry faſting ground.
Nor let him ſhew reluctance to preſent
As food to weary fallow ground, whate'er
The privy vomit from its dirty ſinks.

(19) That wind, which the *Greeks* called *Zephyrus*, becauſe of its animating influence, was by the *Romans* called *Favonius*, both names denoting the gentleneſs of the weather, when the gentle weſtern breezes began to blow, whereby all things were enlivened and cheriſhed. *Pliny* ſays, that this wind blows from that place in the heavens where the Sun ſets at the time of the equinox; that it begins the ſpring, opens the earth, and is very wholſome with its gentle cold, *lib.* xviii. 34. Our author ſays, *lib.* viii. 11. that they begin to blow about the 5th of *February*; and *Varro*, before the 7th day of the ſaid month; and *Pliny* ſays they begin to blow commonly about the 8th.

(20) *Riphæa bruma.* The *Riphæan* mountains are in the northern parts of *Muſcovy*, out of which the river *Tanais*, now called the *Don*, ariſeth, and empties itſelf into the *Palus Mæotis*. In theſe mountains the colds in winter are exceeding ſevere.

(1) *Orphei Lyra.* The *Harp* is a conſtellation in the northern hemiſphere. The poets feign, that it was placed in the heavens in honour of *Orpheus*, who was, as ſome ſay, ſon of one of the *Muſes*. *Varro*, *lib.* ii. *cap.* 5. ſays, that what the *Greeks* called λύρα, was by the *Romans* called *Fidis*. Our author ſays it begins to ſet the firſt of *February*. The brighteſt ſtar in the conſtellation was by the *Romans* called *Fidicula*: but *Pliny*, if I miſtake not, calls always the whole conſtellation by this name: and *Columella* ſeems to call it ſometimes *Fidis*, ſometimes *Fidicula*.

(2) *Hirundo cantârit.* *Pliny* ſays, that ſwallows are ſeen the 22d of *February*; and *Columella*, on the 23d of the ſaid month.

Now

Now let him with the ſharp point of the hoe
Attack again the ſurface of the ground
Condens'd with rains, and hard'ned with hoar froſts:
Soon after with the tuſk of rake or ſpade
The green turf's lively herbage let him bruiſe,
And mix well with the clods; that of the field,
Now ripe for plants, and ſeeds, the nurſing breaſts
May be unbound, and [*nouriſhment convey*].
Then let him alſo take the glitt'ring ſpade,
Worn with the ground, and from each adverſe bound,
Straight narrow furrows draw, from ſide to ſide,
And then obliquely with ſmall paths divide.
Now, when the well-comb'd earth her filthy garb
Puts off, and in gay dreſs, and well-ſet hair,
Appears, and her own plants and ſeeds demands,
Then plant the various flow'rs, thoſe earthly ſtars,
White *gilliflow'rs*, and the bright-yellow eyes
Of *marigold*, and fair *Narciſſus' hairs* (3),
The ſtern and furious *lion's gaping mouth* (4),
And *lilies*, which in baſkets long preſerve
Their verdure; and the *hyacinth*, white as ſnow,
Or blue; then let the beauteous *violet*
Be planted, which, with purple and with gold
Richly adorn'd, its boughs and leaves extends,
And that which creeps pale-colour'd on the ground;
The *roſe* likewiſe, too full of modeſt bluſh.
Now ſcatter *all-heal*, with its healing tear,
And *horned poppies*, with their wholſome juice,
And *poppies* which bind faſt eſcaping ſleep.
From *Megaris* now let the genial ſeeds
Of *bulbs* (5) be brought, which ſharpen mens deſires,
And put young modeſt ladies on their guard.

And

(3) *Narciſſi comas*, daffadil. The poet tells us, that a certain beautiful boy, ſeeing himſelf in a fountain, fell in love with his own image, and, pining away, died; and was changed into a flower of that name.

(4) *Hiantis fera leonis*. I have not found out the name of this flower, which, when it opens, reſembles the gaping mouth of a lion.

(5) *Bulbi*. *Pliny*, *Cato*, and ſeveral other antient authors, make great account of bulbs, which, in their days, were ſo common, that, as father *Hardouin* obſerves, they thought it needleſs to mention their names; and that now they are ſo much in diſuſe, that we ſcarcely have any knowledge of thoſe which the antients valued moſt. *Pliny* reckons the *ſcilla* or *ſquilla*, the ſea-onion, as the *French* call it, among the firſt; and mentions a few others with *Greek* names, which I believe few at preſent know what they

And ſuch as *Sicca* (6) gathers, and finds hid
Below *Getulian* (7) clods; and *rocket* (8) ſown
Near to *Priapus*, crown'd with ears of corn,
That ſlow and drowſy huſbands it may rouſe.
Small *lettice* now is ſown, which, full of leaves,
With tender fibres grows; and ſhort *chervil*,
And *endives*, which the blunted palate pleaſe:
And garlicks, ſmall and great (9), which far and wide
From their divided cloves diffuſe their ſmell;
And herbs they mix with beans for vulgar fare (10).
Now is the time for *ſkirwort*, and that root
Which comes of *Syrian* ſeed (11), which ſlic'd is given

they are. Thoſe of *Megara*, a city of *Achaia*, between *Athens* and *Corinth*, are moſt commended; they were, it ſeems, great provocatives, and as ſuch are taken notice of by *Petronius*, *Martial*, *Ovid*, and others; and as ſuch our author mentions them.

(6) *Sicca*, an inland town, and a colony in *Numidia*, as *Pliny* ſays, *lib.* v. *c.* 3. Some authors call it *Veneria*.

(7) *Getuli*. The *Getulians* were a very numerous people of *Africa*. *Pliny* mentions them as inhabiting many different places thereof, and diſtinguiſhes them by ſeveral names, as *Getuli Autolotes*, *Getuli Daræ*, &c. He places ſome of them in *Mauritania Cæſarienſis*. *Ptolemy* places them in *Inner Libya*. Some authors place them between *Carthage* and *Numidia*. It is probable, that, being a numerous people, they ſent ſome of their number into different places.

(8) *Rocket*, a very hot herb, good for generation, as *Pliny* and ſeveral others affirm, it being a great provocative to venery; which the author inſinuates by ſaying, it is ſown near to *Priapus*.

(9) *Ulpicum*, a larger ſort of garlick: I have not found it under this name, in ſuch of our botaniſts as I have looked into. *Columella* ſays, *lib.* xi. *c.* 3. that ſome call it *Punic garlick*, but the *Greeks* call it *Aphroſcorodon*; and that it is of a much greater growth than common garlick. *Pliny*, *lib.* xix. *c.* 6. ſays, that the *Greeks* called it *Cyprian garlick*; others *Antiſcorodon*; and that it is much eſteemed in *Africa*, as a principal ingredient in their delicate ſalads: that it ought to be ſarcled or hoed, *ſimulatque tria folia erumperint*, as ſoon as three blades or leaves ſhall ſpring out of it. *Columella* ſays, *cum ternas fibras emiſerint ſpicæ*, when its cloves ſend forth three fibres; by which we may obſerve, that *Columella* means the ſame thing by *fibræ*, as *Pliny* does by *folia*, *viz.* the blades, as he ſays, that wheat ought to be ſarcled *cum eſt trium fibrarum*. I believe it was obſerved before, that father *Hardouin* underſtood this to ſignify when it has three fibres at the root, which, I think, is a miſtake. When mixed with oyl and vinegar, it raiſeth a ſurpriſingly great froth, as *Pliny* obſerves, which, perhaps, is the reaſon why it is called *aphroſcorodon*.

(10) *Quæque fabis habilis fabrilia miſcet*. Some authors ſay, that they uſed to mix with beans water-creſſes, cat-mint, and mother of thyme, penny-royal, *&c.* ſo that in this line he comprehends all theſe and other herbs uſually mixed with beans, without naming them, as being very well known: but the general opinion is, that we have not the true reading of this line; and the attempts that ſome have made to correct it, are ſo different from the text, that it is needleſs to mention them.

(11) *Radix quæ venit Aſſyrio ſemine*. What this root is, it is not eaſy to determine: ſome ſay it was *gingidium*, toothpick-chervil. *Pliny* and *Dioſcorides* ſay it is like the *ſtaphylinus*, the wild parſnip, but ſmaller and bitterer; and is eaten both raw and boiled, and is of great benefit to the ſtomach.

With moiſt'ned lupines joined, that it may
Provoke freſh bumpers of *Peluſian* beer (12).
The low-pric'd pickles at no other time,
Nor *caper-buſh*, nor mournful *el'campane*,
Nor *fennel-giant*, with its threat'ning rods,
Are planted: now the creeping graſs of *mint*,
And *dill*'s ſweet-ſmelling flow'rs, are ſcattered;
And *rue* (13), which the *Palladian berry*'s taſte
Excels; and *muſtard*, which will force to weep
Him that provokes it: now is ſet the root
Of *Aliſander* (14), and, which cauſeth tears,
The *onion*; and that herb (15) which ſeaſons milk,
And from the ſlave's audacious front removes
The ſhameful brand, and tokens of his flight;
And, therefore, by its *Greek* name it declares
Its virtue; and at this ſame time is ſown
That herb (16), which o'er the whole terreſtrial globe

Doth

(12) *Zythum*, a kind of drink made of barley, firſt in uſe among the *Egyptians*; hence our author calls it *Peluſiacum Zythum*. Some authors ſay it was made both of barley and wheat.

Peluſium, once a city in *Egypt*, now only a village, called *Bebais*, as ſome authors ſay, near the eaſtern mouth of the *Nile*, about 150 miles from *Alexandria*.

(13) *Ruta*. Our author ſays it excels the taſte of the *Palladian* berry, meaning the olive, which was dedicated to *Minerva*. Some, inſtead of *victura*, read *jutura*, to ſignify that rue, joined with oil, improved the taſte thereof.

(14) *Oleris pulli radix*; in other places, *Columella*, as alſo *Pliny*, call it *olus atrum*, from the blackneſs of its root and ſeed. The *Greeks* call it *Smyrnium* and *Hippoſelinum*. The *Engliſh* writers call it *Alexander*, which ſome think to be a corruption of *olus atrum*.

(15) This herb, by the deſcription the author gives of it, is *lepidium*. *Pliny* ſays it is only uſed with milk. *Columella*, *lib.* xii. 8. preſcribes it for making what he calls *oxygala*, ſour milk. *Pliny*, *lib.* xx. *c.* 17. ſays, that it is placed among the cauſtics; that it removes freckles, cicatrices, and marks upon the face. It ſeems that ſlaves uſed it to remove certain *ſtigmata* or marks their maſters put upon them; which being obſerved, father *Hardouin* ſays, they introduced the cuſtom of branding them with a hot iron. It ſeems it has its name from λεπὶς, a ſpot or mark upon the face: probably it may be ſo called from λεπίζω, *decortico*; for *Dioſcorides* ſays, that the leaves of it have an acrimonious ulcerating quality.

(16) *Braſſica*: what the *Romans* underſtood by this word, is but imperfectly expreſſed by the word *cabbage* or *colewort*. They comprehended a variety of pot-herbs under this name, of which our author here mentions fifteen different ſorts, which, no doubt, were all diſtinguiſhed by ſomething peculiar to each, which I believe is very difficult now to find out, he mentioning moſt of them without any particular deſcription. *Pliny* indeed gives a pretty diſtinct account of a few of them, but takes no notice of ſeveral of the ſorts mentioned here. The *Romans* were great lovers of thoſe kinds of pot-herbs; and both *Cato* and *Pliny* commend them highly for their great uſefulneſs, both for food and phyſic. What *Cato* ſays is very remarkable, that the *Romans* made uſe of no other

things

Doth flouriſh, and in great abundance yields
To low *Plebeian*, and the haughty King,
In winter, cabbage; and green ſprouts, in ſpring:
Such as in antient *Cuma*'s turfy ſhore (17),
And in *Abruzzo* (18), and near *Segni*, grow (19)
On mount *Lepinus*, and fat *Capua*'s plains (20):
Such as the gardens in *Caudinian* ſtraits (1),
And *Stabian* lands (2), for fountains much renown'd,
And learned *Naples* (3), with *Sebethis*' ſtream (4)
Bedew'd,

things for phyſic for ſix hundred years, from the foundation of *Rome*; and about that time Phyſicians began to introduce themſelves among them, very much againſt his opinion, who was a mighty ſtickler for their antient plain way of living, which, no doubt, contributed much to the preſervation of their health; but, when once luxury got footing among them, and they began to loath their former plain diet, their diſeaſes, no doubt, varied alſo, and different medicines became neceſſary. Both *Cato* and *Pliny* mention a great many caſes, wherein the uſe of *braſſica*, differently prepared, was very beneficial; which is not my buſineſs to trouble the reader with.

(17) *Braſſica Cumana*. *Pliny* ſays, that this kind is of a low ſtature, with leaves ſitting upon the ground, and a broad ſpreading head. Father *Hardouin*, from *Dodonæus*, ſays it was of a red colour, and is what the *French* call now *Chou rouge*, red cabbage. It ſeems it was originally of *Cuma*, once a colony, and a very conſiderable town, upon the ſea-ſhore in *Campania*; the place is now intirely ruinous, the ſhore is graſſy, and may very well be called *ceſpoſum littus*; as it is in our author, tho' ſome editions have it *cepoſo*, others *tepoſo*: probably the editors thought, that, if the author meant a turfy ſhore, he would have ſaid *ceſpitoſo*; but this is what they could not be very ſure of.

(18) *Quæ Marrucini pariunt*. Theſe people formerly inhabited a part of the kingdom of *Naples*, now called *Abruzzo*, on the coaſt of the *Adriatic* ſea. *Pomponius*, in his notes on our author, ſays, this ſort was ſomewhat reddiſh with few leaves.

(19) *Quæ parit Segnia*. *Segni*, a town in *Latium*, which antiently belonged to the people called *Volſci*. It lies about 30 miles eaſt of *Rome*; it ſtands upon the top of mount *Lepinus*. This ſort, as the forementioned author ſays, is ſhorter, thicker, and more ſavoury, than the others; and they commonly eat them with oil.

(20) *Capua*, a famous town in *Campania* in the kingdom of *Naples*. Some very good authors, as *Livy*, *Pliny*, and others, ſay, that it has its name *a Campo*, from the ſpacious fields where it is ſituated; and it is called *pinguis*, fat, from their great fertility.

(1) *Caudium oppidum*, and *Furcæ Caudinæ*; a very remarkable place, where the *Roman* army was ſurpriſed by the *Samnites*, and made to paſs under the yoke, of which *Livy* gives an account in his ix^th^ book. It lies about four miles from *Santa Agatha*, and ſixteen miles eaſt of *Capua*. Theſe *Fauces Caudinæ* are now called *Stretto d'Arpaia*, and *Giogo di Santa Maria*; the village itſelf is called *Arpaia*. The ſaid *Pomponius* ſays, that this ſort is the tendereſt of any.

(2) *Stabiæ*, a ſmall town in *Campania*, upon the ſea-coaſt, about 5 miles from the mouth of the river *Sarnus*, which empties itſelf into the gulph of *Naples*. It is about 10 miles from *Surrentum*; the river *Sarnus* is now called *Scafati*.

(3) *Doctaque Parthenope*. The city of *Naples* was antiently ſo called, as *Pliny* ſays, becauſe *Parthenope*, one of the *Sirenes*, was buried there. Our author calls it *learned*, becauſe, in his days, probably it was famous for learned men. *Pomponius* ſays, that the *braſſica* of this place was formed like a *thyrſus*; by which, I ſuppoſe, he means, that the leaves were ſo ſet upon the ſtalk as ſomewhat to reſemble a ſpike, a name given to the flowers of any herb which are ſet ſo cloſe, and in ſuch a manner, as to form an acute

Bedew'd, and the *Veſuvian* (5) fields, produce:
Such as the charming ſweet *Pompeian* marſh (6),
Near the *Herculean* ſalt-pits (7), does afford;
And *Siler* (8), which flows down with cryſtal ſtream:
Thoſe which the hardy rough *Sabellians* (9) give
With ſprouty ſtalks, and ſervile *Brutian* lands (10),
And apple-bearing *Tibur*, and the lake
Of *Turnus* (11), and *Aricia*, mother of leeks (12).

When

cone; but, in the *thyrſus*, the leaves, or flowers, or fruit, are ſet more looſely; ſo that there are ſpaces viſibly betwixt them.

(4) *Sebethis*, a very ſmall river hard by *Naples*, of which the water is conveyed to moſt of the ſtreets of that city: the common people call it *Fornello*; ſome call it the river *della Maddalena*: a part of it runs by the walls of the city, and falls into the gulph near *St. Magdalen's* bridge.

(5) *Veſvia rura*, *Veſevum*, or *Viſurium*, a well-known mountain near *Naples*; all the country round it was very delicious, before it was ruined by the eruptions of the volcano. *Pomponius* ſays, that the *braſſica* of theſe lands was of a more bitteriſh taſte than that of others, notwithſtanding very agreeable to the taſte.

(6) *Pompeia palus*. *Pompeii*, or *Pompeianum*, formerly a conſiderable town, but now ruinous, in *Campania*, ſituated at the mouth of the river *Sarnus*, upon the gulph of *Naples*; it is now called *Torre dell' Annunciata*. *Pliny* ſays, that this kind of cabbage was of a taller ſort; that its ſtalk was ſmall from the root upward, but that it grew thick amongſt the leaves, which were thinner and narrower than thoſe of other ſorts, and were exceeding tender, which made amends for their not bearing the cold.

(7) *Salinis Herculeis*. *Herculaneum* was a town in *Campania*, upon the gulph of *Naples*, where it ſeems were ſalt-pits. Some authors ſay it is now called *Torre di Ripalta*; others call it *Torre del Græco*. *Pliny*, in enumerating the places upon the coaſt of this gulph, mentions it after *Naples*, and after it he places *Pompeianum*.

(8) *Siler*, or, as *Pliny* calls it, *Silarus*; a river, which formerly ſeparated the *Picentini* from the *Lucani* almoſt in the middle, between *Salernum* and *Peſtum*, about 12 miles from each: it emptieth itſelf into the gulph of *Salerno*, and is now called *Selo*.

(9) *Braſſica Sabellica*; ſo called from *Sabelli*, a rough and hardy people, who dwelt in the mountains between the *Sabini* and the *Marſi*. *Pliny* makes them a colony of the *Samnites*; but *Cato*, in his *Excerpta Orig.* ſays, that the *Sabelli* were ſo called, becauſe they were the offſpring of the *Sabini*. *Pliny*, *lib.* xix. *c.* 8. ſays, that the leaves of this ſort of cabbage are curled even to admiration, the thickneſs of which extenuated their ſtalks; they are ſaid to be the ſweeteſt of all. Our author ſays, they had a ſprouty ſtalk.

(10) *Brutii*, a people that inhabited that part of the kingdom of *Naples* now called *Calabria*, which lies partly on the *Adriatic*, and partly on the *Mediterranean* ſeas. *Aulus Gellius*, *lib.* x. ſays, that they were conquered by the *Romans*, and reduced to a ſtate of ſervitude, becauſe they were the firſt who received *Hannibal*. *Pliny* ſays, their cabbage was nouriſhed by the cold, of exceeding large leaves, ſmall ſtalks, and of a ſharp and poignant taſte.

(11) *Lacus Turni*, or, as *Pliny* calls it, *Lacuturris*, from a lake and tower in the valley of *Aricia*. This ſort of *braſſica* had a very large head, and numberleſs leaves; ſome of them grew up round, others extended themſelves in breadth. Some think they are that ſort which the *French* call *choux cabus*, headed cabbage, becauſe they grew into the ſhape of a man's head.

(12) *Aricia*, now called *l'Arriccia*, a place in *Latium*, where there was a famous grove ſacred to *Diana*, called *Lucus Aricinus*, near *Veletri*. This place was called the

mother

When to the looſe and well-prepared earth
We have committed all theſe ſeeds and plants (13),
With conſtant culture, and unweary'd care,
While pregnant, we her cheriſh, that full crops
With double uſ'ry may repay our pains.
Firſt, I adviſe large fountains to convey
Into your garden, leſt the parching drought
Mar the conception, and burn up the birth.
But, when the pregnant earth her fruitful womb
Does open, and her hidden knots unbinds,
And all her florid offspring, unconfin'd,
Breaks forth; then let the careful Gard'ner come,
And from his wat'ring-pot, with gentle drops,
Like miſling rain, bedew the infant plant,
And with his forked iron the ſurface comb,
And from the furrows throw the choaking weed.
But if on buſhy hills your garden's plac'd,
And from the woody tops no gentle ſtreams
Glide down; then, with the clods of well-trench'd ground,
Together thrown, thy beds and borders raiſe,
That ſo the plant may be inur'd to grow
In the dry duſt, and, when it changes place,
The dry and ſcorching heats it may not dread.
'Soon as the Prince of flocks, and of the ſigns (14),

Who

mother of leeks; probably becauſe they were firſt cultivated there, and, becauſe of their excellency and great plenty, they were ſent from thence to other countries: they are much celebrated by many authors, particularly *Martial*, *lib.* xiii. *epigr.* 19. *Pliny* ſays, that the cabbage of this place did not grow higher than that of *Cuma*, whoſe leaves ſat upon the ground; that it was reckoned the moſt profitable kind, becauſe it put forth ſprouts with little ſtalks almoſt under all its leaves.

(13) Our author has mentioned ſeveral ſorts of *braſſica*, which *Pliny* has taken no notice of; but he has mentioned ſome which are not in our author: and he tells us, *lib.* xx. *cap.* 8. that the antient *Greeks* divided their *braſſica* into three different ſorts; *viz.* the *curled*, which they called *ſelinoidea* from its likeneſs to parſley, which is good for the ſtomach, and ſoftens the belly; the other ſmooth, with ſmaller leaves growing out of the ſtem; the third, properly called *crambe*, with ſmaller leaves, ſingle, and very thick, bitterer than the other, but very efficacious. *Cato* eſteemed the curled ſort the beſt; next to it, the ſmooth, with great leaves, and a great ſtem: ſome ſay, that the wild *braſſica* is properly the *crambe*. Some call it *braſſica petræa*, becauſe it grows in ſteep rocky places, ἐν πραμνώδεσι τόποις, as *Dioſcorides* ſays; and from this, they think, it has its name; which ſeems too far fetcht. Of all theſe different ſorts the *cymata*, *i. e.* the ſprouts, as *Pliny* ſays, are, by all nicer palates, reckoned the ſweeteſt, and more tender and delicate than the *braſſica* itſelf. They are the ſmall ſtalks ſhooting out of the main ſtem or ſtalk.

(14) Here the author alludes to the ſtory of *Phryxus* and *Helle*, ſon and daughter of *Athamas*

Who cloud-born *Phryxus* ſafe to harbour brought,
But dropt his ſiſter *Helle* in the deep,
Shall from the ſwelling waves lift up his head,
The nurſing earth her boſom ſhall expand,
And claim the adult ſeeds, and ſhew deſire
In wedlock with ſet plants herſelf to join:
O men! keep conſtant watch, good reaſon why!
With ſilent pace the ſeaſons fly away,
And without noiſe the year is turned round.
Behold! with ardent wiſh, and fond deſire,
The moſt indulgent mother now demands
Her offspring, her own children which ſhe bore,
To nurſe and bring them up with tender care.
The time's now come, now to the mother's care
The tender pledges of her love commit:
The parent with her own green offspring crown;
Adorn her with her hair; in order ſet
Her locks: now likewiſe let the florid earth
Be curled with green parſley, and made glad
With the green leek's long and diſhevell'd hair;
Let the wild parſnip her ſoft boſom ſhade.
Now let ſweet-ſmelling plants, of foreign lands
The gifts, from the *Sicanian* (15) hills deſcend,
And from mount *Hybla*'s (16) lofty ſaffron tops.

Athamas King of *Thebæ*, by his wife *Nephele*, who, flying from the ſnares of their ſte[illegible] mother *Ino*, ſwam over the ſea upon the back of the ram with the golden fleece. *Helle* fell into the ſea, and was drowned; from her that ſea has ſince been called the *Helleſpont*. *Phryxus* got ſafe to *Colchos*, and ſacrificed the ram to *Mars*, and hung up the golden fleece in his temple, which afterwards became the ſubject of two noble poems; the one *Greek*, the other *Latin*. *Phryxus* is called *Nubigena*, cloud-born, from his mother's name *Nephele*, which, in *Greek*, ſignifies *a cloud*. The poet's intention here is, only to deſcribe the Sun's entering into the ſign *Aries*, the Ram, which he calls the *Prince of flocks*, becauſe of the worth and uſefulneſs of that animal; and *the firſt of the ſigns*, becauſe the antients began their year in the month of *March*; and, in enumerating the ſigns of the Zodiac, we ſtill begin with *Aries*. The *Helleſpont* is a narrow ſea by *Conſtantinople*, dividing *Europe* from *Aſia*: it is narroweſt between *Seſtos*, a town in *Thracia* in *Europe*, and *Abydos*, a town of *Phrygia* in *Leſſer Aſia*, diſtant about ſeven or eight furlongs: theſe two places are now called the *Dardanelles*. Some call the ſea *the ſtraits of Gallipoli*, or *il braccio di San Georgio*.

(15) *Sicania*, another name for *Sicily*: a well-known, large and opulent iſland in the *Mediterranean* ſea, ſeparated by a very narrow ſea, of 1500 paces, from the kingdom of *Naples*.

(16) *Hybla*, a mountain in *Sicily*, famous for honey; the bees feeding there upon many odoriferous plants.

From

From gay *Canopus* (17) let ſweet *marjorams* (18) come,
And let ſweet *cicely* from *Achaia* brought (19),
With better juice than the myrrh-tree diſtills,
And always imitates thy doleful tears,
O *Cinyreian virgin!* and thoſe flow'rs
Be planted, which from *Ajax'* mournful blood
Ariſe, who was by partial judges doom'd (20);
And *amaranths*, which never fade nor die.
And, in due order let the Gard'ner place,
In plants, a thouſand various colours, which
Rich nature does bring forth, and which he ſow'd
In ſeed; now let ſea-cabbage alſo come,
Tho', to the eyes a foe, it blunts the ſight.

(17) *Canopus*, a town in *Egypt*, at the mouth of the *Nile*. Our author gives it the epithet of *hilaris*, chearful; other authors ſay it was much addicted to voluptuouſneſs. It ſeems to have given name to one of the mouths of the *Nile*; although the learned father *Hardouin* ſays, in his note on *Plin. Hiſt. Nat. lib.* v. *cap.* 10. that it is uncertain whence the *Canopic* mouth of the river had its name; whether from a town, or a man, or ſome other thing, *Pliny* having made no mention of the town. But, it ſeems pretty clear, from *Pliny*'s own words, that it had its name from this town: *Sunt in honore & intra decurſus Nili multa oppida, præcipue quæ nomina dedere oſtiis, non omnibus, ſed celeberrimis ſeptem, proximo Alexandriæ Canopica, deinde, &c.*

(1) *Sampſuchum, Amaracus. Pliny, lib.* xxi. *cap.* 12. ſays, that *Diocles* the phyſician, and the *Sicilians*, called that herb *amaracus*, which the *Syrians* and *Egyptians* called *ſampſuchum*. Father *Hardouin*, in his note on this herb, ſays that it is a miſtake to think, that what in the ſhops is called *majorana*, *la marjolaine*, is the *ſampſuchum* or *amaracus* of the antients; for this reaſon eſpecially, becauſe *Dioſcorides* ſays, that the *ſampſuchum* creeps upon the ground, but the *majorana* riſes high; but *Matthiolus* thinks, that they are much the ſame: and, if any deſire a full deſcription of both, they may conſult this learned author, who has delineated and deſcribed them fully, but does not make the *ſampſuchum* to creep on the ground in father *Hardouin*'s ſenſe: he thinks, that *majorana* was ſo called, becauſe, being of a very agreeable ſmell, it was cultivated by the ladies with great care, both in the ground, and in earthen pots; and upon no herb greater pains was beſtowed, *p.* 535.

(19) This herb is called *myrrhis*, or *myrrha*, or *ſmyrrhiza*, as *Pliny* ſays; and, according to him, it is very like hemlock in its ſtalk, leaves, and flower, but leſſer and ſmaller, not unpleaſant to eat. *Dioſcorides* adds, that it has an oblong, ſoft, round, and ſweet-ſmelling root. Mr. *Miller* calls it *ſweet cicely*; ſome think it to be *angelica*; others *chervil*; others *laſerpitium*, or *ſmyrnium*; the *French* call it *cherfeuil muſqué*.

Myrrha, the daughter of *Cynaras* King of *Cyprus*, was transformed into a tree of that name, which always ſweats out a juice, in memory of the many tears ſhe ſhed in the time of her affliction. See the fable elegantly told by *Ovid*, *Metamorph. lib.* x.

(20) *Ajax*, a famous Hero in the *Grecian* expedition againſt *Troy*: he contended with *Ulyſſes* for *Achilles*'s armour, and was caſt by the Princes who judged of their pretenſions; which ſo affected him, that he grew delirious, and killed himſelf. The poet tells us, that he was turned into an *hyacinth*, which wears upon it the two firſt letters of his name, *a*, *i*. Our author ſays, this herb ſprung out of his blood.

And

And now let *lettice* (1), with its healthful ſleep,
Make haſte, which of a tedious long diſeaſe
The painful loathings cures; one ſort grows green,
With num'rous thick-ſet leaves; a ſecond ſort
With duſky purple hair is ſprucely dreſs'd,
Both call'd *Cecilian* (2), from *Metellus'* name;
The third with thick, but a ſmooth top, looks pale;
Of *Cappadocia*, its own nation, this
Retains the name: there's that which is mine own,
Which *Cadiz* (3) on *Tarteſus'* ſhore brings forth;
White is its curled top, white is its ſtalk.
And that which *Cyprus* (4) on fat *Paphian* land
Doth nouriſh, which with well-trimm'd ſcarlet hair,
And milk-white leg, a gay appearance makes.
As many as their features, ſo the times

(1) *Lactuca*, lettice. *Pliny* ſays, that all ſorts of it have a ſoporiferous quality, but eſpecially a blackiſh ſort, which, from the abundance of ſoporiferous milk contained in it, as in poppy, was called *meconis*; and that this kind alone, amongſt the antient *Italians*, was greatly eſteemed, and from the abundance of milk in it was called *lactuca*: that all ſorts of it are of a cooling nature; therefore in ſummer are very grateful to the ſtomach, and free it from nauſeating, and give a good appetite; and adds, that the Emperor *Auguſtus* was, by the uſe of it, cured of a great fit of ſickneſs, by the prudent advice of *Antonius Muſa* his phyſician, his former phyſician having denied him the uſe of it; for which cure the commons of *Rome* erected a ſtatue to *Muſa*, hard by that of *Æſculapius*. See *Sueton. in Auguſt. cap.* 59. This, ſays he, gave ſuch reputation to lettice, that they uſed to preſerve it in oxymel, to be uſed during the months it was not to be found green.

(2) *Columella* mentions here five different ſorts of lettice, moſt of which have their names either from the perſons who brought them to *Rome*, and cultivated them much; or from the country which they were brought from. That of a dark, and ſomewhat of a purple colour, and that of a green colour, and a curled leaf, he calls *Cecilian*, from *Cecilius Metellus*, who was Conſul in the firſt *Punic* war, in the year of *Rome* 502. *Pliny* ſays, that the purple-coloured, with a very great root, was ſo called; and that it was rightly ſown in *January*. The *Cappadocian* has a pale, ſmooth, thick leaf, and is ſown beſt in *February*.

(3) That of *Betica*, and upon the borders of *Cadiz*, which *Columella* calls his own, becauſe he was a native of that country, was white, with a leaf very much curled: the ſeaſon for ſowing it was in *March*.

(4) There was the *Cyprian* kind, of a whitiſh-red colour, with a ſmooth and very tender leaf, which is planted very commodiouſly till the 13th of *April*. See for all theſe ſorts *Columella, lib.* xi. *c.* 3.

Pliny mentions ſeveral other ſorts, one of which he calls *Cilician*, which has the leaf of the *Cappadocian*, except that it is curled, and broader.

The *Greeks* had various ſorts, ſome with broad, ſome with round ſtalks, ſome white, ſome red, ſome black, ſome purple, ſome with large, ſome with narrow leaves like endive. They had one ſort they called *Laconicon*, becauſe it was ſhort, and ſat cloſe to the ground; another they called *picrida*, becauſe it was of a bitteriſh taſte, which was the worſt of all. They had another ſort they called *eunuchion*, becauſe they reckoned it hurtful to generation; this ſort, *Pliny* ſays, was round, with a very ſmall root, and broad leaves.

Of

Of planting each; when the new year begins,
Aquarius (5) the *Cæcilian* lettuce ſows,
And in the mournful month (6) the prieſts of *Pan*
The *Cappadocian* preſs into the ground.
Mars! in thy calends the *Tarteſian* (7) ſow,
The *Paphian*, O fair *Venus!* in thine own (8).
While ardently it ſeeks itſelf to join
To its own moth'r inflam'd with like deſire;
And ſhe, moſt ſoft, beneath the eaſy ground
Repoſeth; make her pregnant, now's the time;
For now the world's genial times are come,
Now *love* impatient to coitions haſtes:
The ſpirit of this orb now headlong driv'n,
With *Cupid's* piercing ſtings, impetuous joins
With *Venus* in her revels, and promotes
Her plots of love: to every congruous part
He love for love repays, and fills with young.
The *Father of the ſeas* (9) now with fair words
His *Thetys* courts, and to his bed allures;

(5) When the Sun is in the ſign *Aquarius*, *viz.* in the month of *January*, it is proper to ſow *Cecilian* lettuce.

(6) The month of *February* was called *menſis feralis*, becauſe then they uſed to offer ſacrifices to their infernal gods, or ghoſts of men departed this life; theſe ſacrifices they called *parentalia*: they then pretended to purge the city, which the *Sabines* called *februare*. The prieſts of *Pan Lyceus*, called *Luperci*, then ran up and down the city naked, after they had ſacrificed a goat to *Pan*; and, with girdles made of his ſkin, they ſtruck the hands of pregnant women, that they might have a ſafe delivery: thus they pretended to purge the city. *Pan* was called *Lyceus*, as they ſay, *a lupis abigendis*, becauſe they thought he drove away the wolves. In this month our author directs to ſow *Cappadocian* lettuce.

(7) *Tarteſida*, *Tarteſian* lettuce. *Tarteſus* was a municipal city near *Cadix*, the native country of *Columella*; from whence, it ſeems, this ſort was firſt brought to *Rome*, for which reaſon he calls it his own lettuce. The month of *March* was ſacred to *Mars*, and from him called *Martius*; and then was the ſeaſon for ſowing this ſort.

(8) The month of *April* was ſacred to *Venus*, who was called *Paphia* from *Paphos*, a city in *Cyprus*, where ſhe was either born or worſhipped; ſo the poet calls upon her to plant the *Paphian* lettuce in her own month of *April*, ſo called from *aperiendo*, as ſome think, becauſe the earth then opens her womb, and produces all things in abundance, or receives the ſeeds of many things into her womb.

(9) The heathen theology, and fictions of the poets, are in nothing more inconſiſtent and contradictory, than in the accounts they give of their marine gods; ſometimes one is ſupreme, ſometimes another. By ſome *Oceanus* is called the *Father of the ſeas*, and by *Heſiod* he is ſaid to be the ſon of *Cœlum* and *Terra*, the Heaven and the Earth: they tell us, he has his name from the ſwiftneſs of his motion, παρὰ τὸ ὠκέως ῥεῖν. Some make him the Father of all rivers, fountains, and ſprings: his wife, they tell us, is *Tethys*; ſo called from τίθη, a nurſe, becauſe the water nouriſhes all things.

And he who o'er the waters rules ſupreme (10),
For *Amphitrite* the ſame fondneſs ſhews:
And both theſe ladies, to their huſbands joy,
An azure offſpring quickly bring to light,
And with a ſwimming people fill the ſea.
The *greateſt of the gods* (11) himſelf lays down
His thunderbolt, and with deceitful arts,
As with th' *Acriſian* maid of old, re-acts
His am'rous ſcenes, and, in a violent ſhower,
Into his mother's boſom now deſcends:
Nor does ſhe treat his filial love with ſcorn,
But, with deſire inflam'd, the patient earth
To ſtrongeſt bonds of love ſubmiſſive yields:
Hence ſeas, hence mountains, hence the world intire,
Feel of returning ſpring the warm effects;
Hence ſpring the flaming love, and fond deſires
Of mankind; and of fowls, of flocks and herds,
Which by degrees get ſtrength, and ſeize their hearts,
And in their marrow rage like waſting fire,
Till *Venus*, with enjoyment glutted, fills
Their fruitful joints, and various offſprings brings
To light, and, with a new ſucceeding race
The world's conſtant ruins ſtill repairs,
Leſt with old age it languiſh, and be void.
But why ſo bold ſhould I allow my ſteeds
With loos'ned reins, and unreſtrained courſe,
In paths ſublime through boundleſs ſkies to fly?
Let him whoſe head the *Delphic* laurel crowns,
And warms with more of *Phœbus*' heav'nly fire,
Who into nature's ſecret rites doth pry,
And who the fixed ſecret laws of heav'n,
And of all things the hidden cauſes knows,

(10) *Neptunus* is here called *regnator aquarum*, as if the government of the ſeas was committed to his charge; and his wife is called *Amphitrite*, from ἀμφιτείνω, its ſurrounding, rubbing upon, wearing and preſſing the earth all round; or from ἀμφίτριτος, becauſe the ſea ſtrikes with terror, on all ſides, ſuch as ſail upon it, *&c.*

(11) Here the poet alludes to the ſtory of *Jupiter* turning himſelf into a golden ſhower, and dropping through the tiles into *Danae*'s lap, who was ſhut up in a ſtrong tower by her father *Acriſius* King of the *Argives*, and getting her with child.

It is very common with the poets, to repreſent *Jupiter* as the father, and the Earth as the mother, of all things. Here our poet repreſents *Jupiter* as the ſon, and the Earth as his mother; and by it they ſignify, that the rain makes the earth fruitful.

Make

Make ſuch-like things the ſubject of his ſong.
Let *Phœbus* ſpur this Poet o'er the tops
Of *Dindymus* (12), where *Cybele* encamps,
And o'er *Cithæron* (13), and *Nyſæan* cliffs (14),
To *Bacchus* ſacred; and the lofty tops
Of his own hill *Parnaſſus* (15), where he dwells;
Through ſilent groves of the *Pierian* wood (16),
The *Muſes* friendly and ſecure retreat;
Like frantic prieſteſs, with an hideous voice,
Inceſſantly invoking each by turns,
Thee, *Euan* (17), and thee, *Pæan*, *Delian* born (18),
Me, my *Calliope*, from fruitleſs cares,
And wand'ring after vain purſuits, recalls,
And bids me move in more confined orb,
And with her verſes knit with ſlender thread,
Which, with a tuneful voice, when hard at work,
The Pruner, hanging on his elms, may ſing,

(12) *Dindymus*, a famous hill in *Phrygia*, with two tops, where *Cybele*, whom the poets call the wife of *Saturn*, and the mother of the gods, was worſhipped, and her ceremonies celebrated with noiſe of arms, drums, *&c.* by the *Corybantes*, a company of mad enthuſiaſtic prieſts.

(13) *Cithæron*, a famous mountain in *Bœotia*, ſacred to the *Muſes*, near *Parnaſſus*, of which ſome make it a part: it is now called *Citherone*.

(14) *Nyſæa juga*. The poet here means, either one of the tops of *Parnaſſus*, called *Nyſa*, which was ſacred to *Bacchus*; as the other, called *Cyrrha*, was to *Apollo*: or, perhaps, he had his eye upon *Nyſa*, a city in *Arabia*, where *Bacchus* was educated by the *Nyſæan* nymphs, at the deſire of *Jupiter*, after the death of his mother *Semele*. Some ſay *Nyſa* was one of the tops of *Cithæron* or *Helicon*.

(15) *Parnaſſus*, a very famous mountain in *Phocis* in *Achaia*, ſacred to the *Muſes*, and the conſtant theme of poets.

(16) *Pierius*, a mountain in *Theſſaly*, ſacred alſo to the *Muſes*; from which, as ſome think, they are called *Pierides*.

(17) *Euius*. They ſay this name was given to *Bacchus* by his father *Jupiter*, upon his having performed ſome great exploit: it ſignifies *a good ſon*; and the prieſteſſes of *Bacchus*, in their mad proceſſions and revels, uſed to call upon him by this name; and it is common with the poets alſo to give him this name. *Columella* here puts the poet, who, he wiſhes, would undertake what he himſelf could not perform, into a ſtrange fit of enthuſiaſtic madneſs, and ſends him from one hill and wood into another, and makes him invoke both *Apollo* and *Bacchus*: this laſt is frequently called *Euan*; and his prieſteſſes, in their mad proceſſions, commonly called him by this name.

(18) *Apollo* is called *Delius*, becauſe he was born in the iſland *Delos* in the *Ægean* ſea: it is the chief of the *Cyclades*, much reverenced by the antients.

Pæan was a name they gave to *Apollo*, from a *Greek* word παίω, *percutio*, to ſtrike, ſuppoſing him very dextrous at ſhooting with arrows: or, perhaps, ἀπὸ τῦ παύειν τὰς νόσους, *a ſedando moleſtias*, ſuppoſing him the inventor of phyſic, and the protector of phyſicians.

Calliope, one of the *Muſes*, the mother of *Orpheus*; ſhe is ſaid to be the protectreſs of heroic poetry: ſhe has her name from the ſweetneſs of her voice.

And Gard'ner in his gardens cloath'd in green.
Wherefore what follows here, obſerve to do:
Let *creſſes*, direful to thoſe latent worms,
Which, with food ill-digeſted, th' unſound bowels
Bring up, be ſcatt'red on ſmall ridges, rais'd
Between ſmall furrows at ſmall diſtance plac'd,
And *ſavory*, in taſte reſembling thyme:
The *cucumber*, with tender neck; the *gourd*
With brittle; let the prickly *artichoke* (19)
Be planted, which to *Bacchus*, when he drinks,
Is grateful; not to *Phœbus*, when he ſings:
This ſometimes riſes with a purple head,
Sphere-like, with ſcales cloſe, and compactly ſet;
Sometimes with myrtle hair, and bended neck,
It verdant grows; ſometimes with pungent top,
Like pine-tree cone; expanded ſome appear:
Sometimes 'tis like an oſier-baſket ſhap'd,
With threat'ning prickles horrid; ſometimes pale,
It imitates brankurſine's crook'ned leaves.
'Soon as the *punic-tree* (20), whoſe num'rous grains,
When throughly ripe, a bright-red covering hides,
Itſelf ſhall with its bloody bloſſoms cloathe;
Then is the time *wakerobin-ſeed* to ſow;

(19) *Columella* ſays here, that the artichoke gives an agreeable taſte to wine, and improves it; and therefore is acceptable to *Bacchus*; but, by reaſon of its bitteriſh taſte, it is diſagreeable to *Apollo*, becauſe it hurts the voice. He mentions here ſix different ſorts of artichokes, diſtinguiſhing them by their colour, ſhape, form of their leaves; and other things peculiar to them: the firſt, he ſays, is formed round, and cloſely compacted with a purple *corymbus*; by which he means, that either the ſcales are ſo ſet as to form ſomething of a ſpherical figure, that they have ſomething of a purple colour, or that it puts forth its flower in ſuch a manner; for *corymbus* ſignifies a cluſter of flowers or fruit, ſtanding on pedicles, which are diſpoſed in ſuch a manner as to form a ſphere. A ſecond ſort is of the colour of myrtle-tree flowers; I ſuppoſe he means, has a flower like that of the myrtle-tree, and that it bends with the weight of its head. A third ſort, he ſays, *manet adaperta*, *i. e.* open and expanded, in oppoſition to the fourth ſort, with a *pinea cortex*; by which, I ſuppoſe, he means, that it is ſhaped like a pine-tree cone. A fifth ſort, he ſays, is ſhaped like a wicker baſket, which, I ſuppoſe, was ſomewhat of an oblong figure, wider in the middle, and narrower and more contracted at each end, in which form ſuch as are more prickly may grow. The ſixth ſort, he ſays, is of a paliſh colour, and like the bended or crook'ned leaves of the *acanthus*, ſuch as we ſee them on the chapiters of pillars, of the *Corinthian* order.

(20) *Arbos Punica*, the pomegranate-tree; ſo called, as ſome think, from the red colour of its flowers and fruit. But *Pliny*, *lib.* xiii. *c.* 19. ſays, that it has its name from *Carthage*; probably becauſe it grew there in great plenty, and was firſt brought from thence, being a native of *Africa*: the apple is called *granatum*, becauſe of the great number of grains or ſeeds it contains. The flower of this tree they called *balauſtium*.

Then *corianders*, much renown'd, ſpring up;
Then to the ſlender cumin grateful grow
The fennel-flowers; then from its prickly herb
The ſperage-berry leaps, the mallow ſhoots,
Which follows with its bending head the Sun:
Then likewiſe riſes that *audacious plant*
Which imitates, O *Bacchus!* thine own vines,
Nor dreads the thorns; for 'midſt the prickly briers
The *briony* lifts up its fearleſs head,
And with its claſpers binds the wild pear-trees
And alder-trees, which culture has not tam'd.
As that *Greek* letter, which in order ſtands
Next to the firſt (1), is on the yielding wax
Imprinted with the learned maſter's ſtyle,
So then the *beet*, with white foot, and green leaf,
And with its *Grecian* name, is, with the ſtroke
Of the iron-pointed tool, ſet in the ground.
Yea, now the harveſt, with its fragrant flowers,
Approaches; now the purple ſpring is come;
Now the kind parent does rejoice to ſee,
With changing-colour'd offſpring of the year,
Her brows ſurrounded; now their gem-like eyes
The *Phrygian melilots* diſcloſe; the *violet* beds
Unfold their winking eyes; the *lion* yawns (2).
The *roſe* abaſhed, with a comely bluſh
Unveils her virgin-cheeks, and to the gods
Due honours pays, and with its fragrant ſmell,
Sabean odours like, perfumes their domes.
Ye Nymphs (3), which dwell on *Achelous'* banks (4),

Com-

(1) Our author here alludes to the ſecond letter of the *Greek* alphabet, *Beta*; and ſays, that, as this letter is imprinted upon the wax with a ſtyle, ſo the herb, which bears the name of this letter, is ſet into the ground with a dibble.

(2) *The lion yawns*; by this he underſtands, that, at ſuch a time, a certain flower, which has ſome likeneſs to the mouth of a lion, begins to open and ſpread. The name of this herb I have not as yet found.

(3) Here the Poet addreſſes himſelf to the Nymphs of ſeveral denominations, and invites them to gather the flowers of this agreeable ſeaſon: what kind of beings theſe Nymphs were, is difficult to determine. Both the *Greek* and *Latin* Poets, who delighted in fictions, make mention of many different ſorts of them; and by them they underſtood certain powers, who preſided over, or had their reſidence and abode in certain places and things; and they repreſent them, as appearing in the form of beautiful young women; and there is no end of their ſeveral names and ſorts; ſome celeſtial, others terreſtrial; ſome belonged to the ſea, ſome to rivers, ſome to mountains, ſome to valleys,

Companions of the *Muſes*, which frequent
The *Pegaſeian* ſpring (5), I you beſeech;
Likewiſe, ye choirs of Nymphs, which ſport and dance
Amongſt *Mænalian* oaks (6); and ye which dwell
In foreſts (7), or in the *Amphryſian* wood (8),
Or in *Theſſalian Tempe* (9), or the cliffs
Of mount *Cyllene* (10), or the ſpacious lawns
Of dark *Lycæus* (11), or the caves, bedew'd
With conſtant drops of the *Caſtalian* ſpring (12):
And ye, who in *Sicania* (13) pick'd the flowers
Upon *Haleſus'* banks, when *Proſerpine* (14),
Of *Ceres* born, the blooming lilies cropp'd

leys, ſome to woods and foreſts, others to ponds and lakes, *&c.* and there is ſcarcely any remarkable river, fountain, lake, mountain, wood, or grove, but the Poets have aſſigned Nymphs to them. Some ſay theſe beings were called *Nymphæ*, *ἀπὸ τῦ ἀεὶ νέας φαίνεσθαι*, becauſe they always appear young; or *ἀπὸ τῦ φαίνειν*, becauſe of their ſplendid appearance; for which reaſon they gave this name to young brides, when they firſt ſhewed themſelves in public. Whatever may be the occaſion or original of their name, they ſeem to be nothing but certain powers or divinities of the Poets own making, which, upon all occaſions, have been of mighty ſervice to them, and always helped them forward, and ſupported them when they began to flag and be dull upon their main ſubject. Our author addreſſes himſelf to the greateſt part, if not the whole tribe.

(4) *Achelous*, a famous river in *Greece*, riſing out of mount *Pindus*, dividing *Ætolia* from *Acarnania*: it runs into the *Ionian* ſea, over-againſt the iſlands called *Echinades*.

(5) *Pegaſides* were the *Muſes* that frequented a certain fountain called *Hippocrene*, or, as *Perſius* ſays, *Fons Caballinus*, pretended to be made by the winged horſe *Pegaſus*'s foot. It is a fountain in *Bœotia*, by mount *Helicon*, not far from *Thebæ*.

(6) *Mænalus*, or *Mænalius*, a famous mountain in *Arcadia*, near the city *Tegea*: the *Dryades*, or Nymphs that delighted in oaks, the Poet tells us, frequented this place very much.

(7) *Nymphæ Napeæ*, were ſuch as inhabited valleys and foreſts.

(8) *Amphryſus*, a ſmall river in *Theſſaly*, much celebrated by the Poets. Our author ſpeaks of a wood, which, it ſeems, growing upon the banks of the ſaid river, took its name from the ſame.

(9) *Tempe*, a moſt delicious ſmall valley in *Theſſaly*, through which the river *Peneus* runs, ſurrounded by the mountains *Pelion*, *Oſſa*, and *Olympus*, much celebrated by the Poets.

(10) *Cyllene*, an high mountain in *Arcadia*, famous for cypreſs-trees, where the Poets ſay *Mercury* was born, and for that reaſon was called *Cyllenius*.

(11) *Lycæus* is alſo a mountain in *Arcadia*, ſacred to *Pan*, the Protector of the Shepherds.

(12) *Fons Caſtalius*, a famous ſpring in a mountain of the ſame name in *Phocis*: it was a part of *Parnaſſus*: the fountain was ſacred to the *Muſes*. The Poets ſay it had its name from *Caſtalia*, a virgin, who, flying from *Apollo*, was changed into a fountain.

(13) *Sicania*, another name for *Sicily*; and *Haleſus* is a river in *Sicily*, which riſes in a mountain not far from mount *Ætna*.

(14) *Proſerpina*. The Poets tell us, that ſhe was daughter of *Ceres*, and raviſhed by *Pluto* on the plains of *Enna*, near a city of that name, in the middle of *Sicily*, where *Ceres* had a famous temple; and carried to the infernal regions, where ſhe became his Queen.

Of

Of the *Enniæan* plain, with mind intent
Upon your dances, and was ſnatch'd away
By the *Lethæan* Tyrant, and became
His wife; and ſo the gloomy ſhades preferr'd
To the bright ſtars; the manſions of grim death
To thoſe of life; and the *Tartarean* pit
To heav'n; and *Pluto* to the mighty *Jove*;
And o'er th' infernal kingdom now ſhe reigns:
Now lay aſide your mourning, and ſad fear,
And with a gentle pace your tender feet
Turn hither; and our parent *Earth*'s ſoft hairs
In order in your ſacred baſkets lay.
Here are no ſnares to catch unwary Nymphs,
No rapes to fear; by us chaſte *faith* is kept
Inviolate; pure are our houſhold gods:
With jokes, and careleſs laughter, and with wines
Unmixt, each place is fill'd; with chearful feaſts
And banquets the green meadows gay appear.
Now is the lukewarm ſpring, and of the year
The ſofteſt ſeaſon; now young *Phœbus*' rays
Are gentle, and invite us to lie down
Upon the tender graſs, where with delight
We drink of ſprings, which are not chill'd with cold,
Nor heated with the Sun, which with ſhrill voice
O'er graſſy fields reſounding fly away.
And now *Dione*'s daughter (15), with ſweet flowers,
The gardens crowns; and now the *roſe*, more bright
Than *Tyrian* ſcarlet, does begin to blow.
Not with ſo bright and radiant face appears
The daughter of *Latona* (16), *Phœbe*, when
The cold and cloud-diſpelling North-wind blows;
Nor yet the ardent *Sirius* (17), when his heat
Is moſt intenſe; nor ſtar of fiery *Mars*

(15) *Dione*, the mother of *Venus* by *Jupiter*: *Venus* preſided over gardens, and the month of *April* was ſacred to her; from her mother's name ſhe was called *Dionea*.

(16) *Latona*, in the heathen mythology, is ſaid to have brought forth two children to *Jupiter*, *Apollo* and *Diana*, otherwiſe called *Phœbus* and *Phœbe*; the firſt frequently put for the Sun, and the ſecond for the Moon.

(17) *Sirius* is a bright ſtar in the mouth of *Canis major*, ſo called from its drying and ſcorching influence.

So

So brightly ſhine; nor *Heſperus* (18), with face
So glittering, from th' eaſtern climes returns,
The forerunner of the approaching day;
Nor *Iris* (19), with her glorious rainbow cloath'd
So fulgent, as the chearful gardens ſhine
With their bright offspring, when they're in their bloom.
Mark therefore when the night is near its end,
And the Day-ſtar appears, or when the Sun
His horſes plunges in th' *Iberian* ſea,
Where-e'er ſweet *marjoram* perfumed ſhades
Does ſpread, come now and pluck it; and the hairs
Of daffodil; and fragrant leaves and flowers
Of the wild *panic-tree*, which bears no fruit.
And, that *Alexis* (20) may not look with ſcorn
On *Corydon*'s great wealth, fair *Naïs!* come,
More beauteous than the beauteous boy, and bring
In baſkets *violets*, and fragrant *balms*,
Mixt with white *privet*; and with *ſaffron-flowers*
Sweet *caſſia* bind; and with the pureſt wine,
Which *Bacchus* moſt approves, all theſe bedew;
For *Bacchus* odours with this juice preſerves.
Likewiſe, ye ruſtics, who with hard'ned thumb
The tender flowers crop, with *hyacinths*
Iron-colour'd, the white *oſier* baſkets fill.
Now let the *roſe* the threads of twiſted ruſh
Diſtend; and, with flame-colour'd *marigolds*
Let the ſqueez'd panier burſt; of vernal wares
For ſale, let rich *Vortumnus* (1) have great ſtore;

And

(18) *Heſperus*. The planet *Venus*, appearing in the morning before day-light, is called *Lucifer*; and in the evening, after the Sun ſets, is called *Veſperus*: the morning and the evening ſtar.

(19) *Iris*, the rainbow, reckoned, as *Mercury*, the meſſenger of the gods; but, as ſome think, moſtly in litigious matters, ſo called *quaſi* ἔρις, *i. e.* ſtrife and contention; others, as *Plato* and *Proclus*, rather think ſhe was ſo called from ἰρῶν, *to ſpeak*, becauſe ſhe was employed by them for this purpoſe. *Cicero, de Natura Deorum, lib.* iii. ſays, ſhe was ſaid to be the daughter of *Thaumans*, becauſe of her wonderful and beautiful appearance: ſhe is called by our author *Thaumantias*.

(20) Here our author imitates *Virgil*, *Formoſi paſceris caſtos formoſior ipſe*; and alludes to the ſecond Eclogue.

(1) *Vortumnus*, the god of merchandiſe: he preſided over buying and ſelling, *a vertendis mercibus*: all the firſt fruits were dedicated to him, grapes, apples, pears, cherries, *&c.* There are ſeveral other reaſons given of this name; one is *ab anno vertente*, which

And let the Carrier, with a ſtagg'ring pace,
Wet with much wine, from town with joy return,
Weigh'd down with caſh with which his boſom's fill'd.
But when the harveſt with ripe ears of corn
Grows yellow, and bright *Titan* (2) with his *Twins*
Extends the day, and with his burning heat
Shall ſcorch the claws of the *Lernæan Crab*,
Then *garlick* join with *onions*, and with *dill*
The *Cerealian poppies* (3); and, when bound
In bundles, while they're green, to market bring;
And, when your wares are ſold, with chearful voice
The praiſes of propitious *Fortune* ſound,
And to your gardens haſten back with joy:
And, in new-broken and well-wat'red ground
Sow *baſil*, and with weighty cylinders
Compreſs it, leſt the ſcorching heats pervade
The looſe and open duſt, and parch the ſeeds;
Or the ſmall garden-inſect, creeping in
By ſtealth, infeſt and vex them with its teeth;
Or the rapacious plund'ring ant deſtroy.
Not only dares the *ſnail*, wrapt in its ſhell,
And hairy *palmer-worm*, preſume to gnaw
The tender buds and leaves; but, as ſoon as
The lurid *cabbage*, on its thriving ſtalk,
Begins to ſwell, and pale *beet* bulky grows;
And Gard'ner, free from fear, rejoices in
His adult wares, and, now they're ripe, prepares
The ſickle to put in; oft-times fierce *Jove*
Does dart his grievous ſhow'rs, and with hail-ſtones
The labours both of men and beaſts deſtroys:

which was ſo called by the antients, when the Sun returns to the ſign from whence it began its courſe. If any deſire to have a full account of this pagan divinity, he may conſult *Propertius*, *lib.* iv. *de fabula Vortumni.*

(2) *Titan*: the Sun is frequently called by this name; and the author's meaning is, That, when the Sun is in the ſigns *Gemini* and *Cancer*, the day lengthening, and the heat increaſing, then ſuch and ſuch things are proper to be done. The Poet tell us, that, when *Hercules* was fighting with the ſerpent *Hydra*, with many heads, *Juno* ſent the *Crab* to bite his heel, and that *Hercules* ſlew it. It is called *Cancer Lernæus*, becauſe it was of the lake *Lerna* in *Peloponneſus*, near *Argos*. They tell us alſo, that *Juno* placed it among the ſtars.

(3) *Cereale papaver*: this our author borrows from *Virgil*, *Georg.* i. 211. where *Servius* ſays, that poppy was ſo called, either becauſe it was eaten as corn, or becauſe *Ceres* made uſe of it to forget her ſorrows. *Pliny*, *lib.* xix. 8. ſays, that ruſtics uſed to ſprinkle it upon the cruſt of their bread, mixed with an egg, to make it ſtick to it.

He, likewiſe, oft with rains, pregnant with ſeeds
Peſtiferous, bedews them, which produce
Thoſe worms, which to grey *willow-groves*, and *vines*,
Are hurtful; and o'er all the gardens creeps
The caterpiller, which, with pois'nous bite,
Dries up the plants, which, of their comely hair
Bereft, lie mangled with their naked tops,
And with the baneful poiſon pine and die.
That, with theſe direful woes, the Huſbandmen
Should not be overwhelm'd, labour and uſe,
And various experience itſelf
Of things, their teacher, and their ſafeſt guide,
Has ſhown to wretched men new arts and means
Of ſafety; how to ſtill the raging winds,
And to avert, with ſacred *Tuſcan* rites (4),
The boiſt'rous ſtorm: hence is it that with blood,
And entrails of a whelp, ſnatch'd from the dug,
Rubigo (5), full of miſchief, is appeas'd,
That ſo the verdant herbs he may not parch.
Hence *Tages* (6), (as we're told) the *Tuſcan* Seer,
In borders of his field was wont to place
Th' *Arcadian* aſs's head, ſtript of its ſkin.
And *Tarchon* (7), to avert the thunderbolts
Of mighty *Jove*, his ſeats with white-vine hedge

(4) *Tuſcan rites.* The *Tuſcans* were very famous of old for their ſacred ceremonies and ſuperſtitions, and were the great directors of the *Romans*, who adopted moſt of them.

(5) *Rubigo* or *Rubigus.* Our author puts it feminine; ſome write it *Robigo.* They offered ſacrifice to this god, that he might not ſmite the corns with blaſting and mildew: ſee *Aul. Gell. lib.* iv. *c.* 6. alſo *lib.* v. *c.* 12. They uſed to ſacrifice to him a whelp and a ſheep in the month of *April*, and offered them with frankincenſe and wine: they celebrated his feſtival at *Rome*, on the 25th day of that month, becauſe, about that time, the corns began to be blaſted. *Numa* inſtituted this feaſt in the 11th year of his reign, as *Pliny* tells us, *lib.* xviii. *cap.* 29. Of theſe ſuperſtitious practices, *&c.* he ſays a great deal, *lib.* xvii. *cap.* 28. and *Palladius*, *lib.* i. *cap.* 35.

(6) *Tages* was had in great veneration among the *Hetruſci*; was the Inventor of Divination, as *Tully*, *de Divinatione*, and *Valerius Maximus*, affirm: it ſeems he wrote ſome books upon the art for explaining of prodigies, thunders, lightnings, *&c.* *Plutarch*, *Iſidorus*, and ſeveral other authors, mention him as the Founder of the *Hetruſcan* ceremonies; and the *Auſpices*, *Haruſpices*, and all the other Diviners among the *Romans*, derived their diſcipline from him, which they improved, and amplified afterwards by their own obſervations. If any want to know more of this Diviner, they may conſult *Tully*, *de Divinatione*, *lib.* ii.

(7) *Tarchon.* Perhaps this is the ſame with that *Tarchon* General of the *Hetruſci*, who came to aſſiſt *Æneas* againſt *Turnus* and the *Rutili*, *Virg. Æneid. lib.* viii. *l.* 121, *&c.*

Sur-

Surrounded; and *Amythaon*'s ſon (8), who learn'd
Of *Chiron* various arts, was wont to hang
Nocturnal birds on croſſes, and forbid
On high houſe-tops their mournful ſongs to weep.
But, that dire animals may not devour
The tender blades, it ſometimes has avail'd,
With lees of olive-oil, not mixt with ſalt,
To ſprinkle; or to ſatiate the ſeeds
With that black ſoot, which in the chimney breeds.
It alſo has avail'd, on tender plants
The bitter waters of *horehound* to pour,
Or with much juice of *houſleek* to anoint.
But, if no medicine this hurtful plague
Is able to repel, then to your aid
Let the *Dardanian* arts (9) make haſte and come:
Thrice round the garden's hedge, and all its beds,
With open boſom, and diſhevell'd hair,
Barefooted, ſad and penſive, and aſham'd,
A woman they conduct, who then does feel
The force of ſettled laws, to which her youth
Is ſubject; and when, with a gentle pace,
She has ſurvey'd them, ('tis a wond'rous ſight)
Juſt as a ſhow'r of maſt wrapt in its bark,
Or apples round, rains from the ſhaken tree,

(8) *Amythonias* is *Melampus* the ſon of *Amythaon*, a famous Diviner and Phyſician, as *Pliny* ſays. He is much celebrated by *Homer*, and other Poets: he found out the virtues of one kind of hellebore, which, from his name, is called *Melampodium*. He was, as our author inſinuates, *Chiron*'s ſcholar, who was *Achilles*'s Tutor, and, as ſome ſay, the Inventor of Phyſic, which he taught *Æſculapius*.

(9) *Dardaniæ artes*. Magic was ſo called from one *Dardanus*, a famous Magician, and a great Promoter of this vain, pretended, occult ſcience: he wrote a great deal upon this art, from whom, as *Pliny* ſays, *Democritus*, a great Promoter of it, derived his pretended knowledge. *Pliny*, *lib.* xiii. *cap.* 1. exclaims highly againſt the vanity of this art, and calls it the moſt deceitful of all arts whatſoever; ſays, that it had its riſe, at firſt, from Phyſic; and that, from a pretext of curing people by a more profound and ſacred art of Phyſic, it creeped in gradually, and became in great requeſt; and to the art of curing diſeaſes it added that of foretelling things by Mathematical knowledge, Aſtronomy, *&c.* ſo that it prevailed over all nations almoſt in his time. This *Democritus*, he ſays, gave the firſt recommendation to the art, which the greateſt Philoſophers afterwards were at the greateſt pains to attain to; as *Pythagoras*, *Plato*, &c. He wonders that this art and Phyſic flouriſhed at the ſame time; for *Democritus* and *Hippocrates* were cotemporaries, about the three hundredth year of *Rome*. *Columella* here gives us an account of as vain and ridiculous a practice as any, and yet, in ſome other places, he inveighs againſt all ſuperſtitious practices; and, indeed, it is ſtrange, that both he, and the other ruſtic writers, ſhould ſo gravely recommend this.

The caterpiller, of all ſenſe bereft,
Rolls, with diſtorted body, to the earth:
Thus once, in former times, *Iolcos* ſaw (10)
The *Dragon*, lull'd aſleep with magic ſongs,
From *Phryxus'* golden fleece, fall to the ground.
But now's the time, the early *cabbage* ſtalks
Firſt to cut down, and alſo to pluck up
The *Paphian* and *Tarteſian* lettice-thyrſe,
And with the *leek*, form'd to be often cut,
And *parſley*, the green bundles to ſurround.
Now in the fruitful garden ſprings apace
Salacious *rocket* (11); likewiſe now begin
The ſlipp'ry *rhubarb* (12), *buckthorn*, and *ſea-leek*,
Spontaneous to wax green; the prickly hedge,
Horrid with *butchers-broom*, begins to ſhoot:
Wild *ſperage* likewiſe, which great likeneſs bears
T' *aſparagus*, comes forth; the outmoſt ranks
Oppreſt with thirſt, moiſt *purſlane* now protects:
And the long *kidney-bean*, a conſtant foe
To *arrach*, at ſame time lifts up his head.
The crooked *cucumber* (13), and pregnant *gourd*,
Sometimes from arbors pendent, and ſometimes,
Snake-like, through the cold ſhades of graſs they creep,
And from the Summer-ſun a ſhelter ſeek.
Theſe have not the ſame features, nor one ſhape;
For, if the longeſt pleaſes moſt, which grows
Suſpended by its own head's ſlender top,

(10) *Iolcos*, a town in *Theſſaly*, the native country of *Jaſon*, who, by the aſſiſtance of *Medea*, recovered the golden fleece from *Colchos*, whither *Phryxus* had carried it, where it was conſtantly watched by a dragon, which ſhe, by her magic arts, lulled aſleep, till *Jaſon* carried away the fleece.

(11) *Eruca ſalax*: Rocket is ſo called, becauſe it is a provocative to venery.

(12) *Lubrica lapathos*, ſlippery rhubarb; ſo called from its lubricating and purging quality.

(13) *Cucumis*. It ſeems that this word, amongſt the *Romans*, was of a larger ſignification; and ſignified not only what we call *cucumbers*, but pompions and melons alſo: ſuch of them as grew bulky, and ran out in length, and became very mellow, tender, and flaccid, when throughly ripened, loſt their name, and were called *pepones*; but ſuch of them as grew round, like an apple, they called *melopepones*: but the true *cucumis*, the riper it grows, the more ſolid cartilages does it conſiſt of, and is covered, as it were, with an hard woody cruſt. Our author ſeems here to have deſcribed particularly the *cucurbita*, which grows to a great bulk, ſo that they formed veſſels of them for containing honey and pitch, and goblets for drinking; and, when dried, were made uſe of by boys for ſupporting them in the water, when they were learning to ſwim.

Then from its ſlender neck ſelect the ſeeds;
But if that, with a globe-like body, pleaſe,
Which with too huge a belly ſwells, then chooſe
The ſeed which in its womb incloſed lies;
This will an offspring bring, fit to contain
Hymettian honey (14), or *Narycian* pitch (15):
It likewiſe flagons, fit for *Bacchus'* uſe,
And goblets, meet for water, will produce;
And boys in rapid ſtreams will teach to ſwim:
But then the livid *cucumber*, which grows
With pregnant womb, and hairy like a ſnake,
Lies on its crooked belly, always coil'd,
And, cover'd with the knotty graſs, impairs
The health, and of th' unfriendly Summer makes
Diſeaſes more acute; of this the juice
Is fetid; likewiſe with fat ſeeds 'tis ſtuff'd.
But that which to the dropping water creeps (16)
Below the arbour, and purſues the ſame
As down it trickles, and with too much love
Extenuated, and of a colour white,
More trembling than the udder of a ſow
Which newly has brought forth, and ſoſter is
Than curdled milk juſt in the cheeſe-vat pour'd,
Shall to the taſte be ſweet; and, when 'tis ripe,
In land well watered it yellow grows,
And to ſick mortals ſure relief will bring.
When of *Erigone* (17) the faithful *Dog*,
With *Phœbus'* ſcorching heat all in a flame,
Shall of the fruitful trees the fruits diſcloſe;

(14) *Hymettus*, a mountain in *Attica*, famous for honey.

(15) *Naricia*, a town in *Magna Græcia*, belonging to the people called *Locri*. It ſeems this country produced abundance of pines, which yielded abundance of tar and pitch.

(16) *Pliny* mentions this quality of the *cucumis*, of the pompion-kind, that, when it grows hanging, it always inclines towards water; and, if water be placed near it, it will ſoon ſhew its tendency towards it: ſo here our author ſays it grows ſlender with too much love, *nimio tenuatur amore*.

(17) *Erigone* was the daughter of *Icarus*, who firſt taught the people of *Attica* the uſe of wine, of which the Shepherds having drunk too freely, were intoxicated with it, and ſlew *Icarius*, whoſe dog diſcovered the murder to the daughter, by conducting her to the dead body: her grief was ſo exceſſive, that ſhe hanged herſelf. The Poets have placed her in the heavens, and made her one of the twelve ſigns; and they have done the ſame favour to the dog, and called him *Sirius*, or the Dog-ſtar: it is ſaid to diſcloſe the fruits, becauſe it parches the leaves which cover them.

And when the ſmall white oſier-baſket, fill'd
With mulberries, diſtils with bloody juice;
Then from twice-bearing tree the rathe-ripe fig
Deſcends; then are the wicker baſkets cramm'd
With *Damaſc'*, and *Armenian*, and wax plums (18);
And apples, which moſt barbarous *Perſia* ſent (19)
With native poiſons arm'd (as *Fame* relates):
But now they've loſt their pow'r to kill, and yield
Ambroſian juice, and have forgot to hurt;
And of their country ſtill retain the name:
Thoſe of ſmall ſize, to ripen make great haſte;
Such as *great Gaul* beſtows obſerve due time,
And ſeaſon, not too early, nor too late.
In colds the *Aſian* come, a tardy fruit:
But underneath *Arcturus'* hurtful ſtar
The *Livian-tree*, which with *Chalcidian* vies,
As *Caunian* with the *Chian*, brings forth figs (20);

And

(18) Our author mentions here only three different ſorts of plums, *viz.* the *Armenian*, which, *Pliny* ſays, are commendable for their ſmell. Father *Hardouin* ſays, that ſome modern writers have in vain contended, that they are the ſame as apricocks; the *cereola*, or, as *Pliny* calls them, *cerina*, from their wax colour; and the *Damaſcus plums*, ſo called from *Damaſcus* in *Syria*, which are commonly called *Damaſc prunes*. *Pliny* mentions ſeveral other ſorts, and ſays, *nec aliud pomum ingenioſius geminatum*, ſo curiouſly diverſified by ingraftments.

(19) *Perſica*, peaches: they are natives of *Perſia*, and ſtill retain their name, with very little variation, in ſeveral languages. *Pliny* ſays, they were foreign both to *Aſia* and *Greece*, and that it was late before they were brought into *Italy*; and with difficulty took there; that it is falſe, that they were poiſonous in *Perſia*, &c. By this he ſeems to confute *Columella*'s opinion, which, I ſuppoſe, was commonly received at that time, and not improper to be mentioned in a poem, where fictions often help the Poet very much forward in his work, which he is not to be ſuppoſed always to believe.

Our author mentions only three ſorts; *Præcocia*, *Aſiatica*, *Gallica*. The firſt, *Pliny* ſays, ripen in ſummer, and were brought into *Italy* not thirty years before his time. *Dioſcorides* ſays, that the ſmaller peaches were called *Armeniaca*, and by the *Romans Præcocia*. Some call them *apricocks*, but others, with more reaſon, call them *early peaches*: the *French* call them *les avant-peſches*. The *Aſian* and *Gallican* were of a larger ſize, and have their names from the countries where they were moſt cultivated, and did thrive beſt, and from whence probably they were firſt brought to *Rome*. *Pliny* gives the preference to a ſort he calls *duracina*, of a firmer and harder fleſhy ſubſtance, which does not cleave, and is not eaſily ſeparated from the ſtones.

(20) *Columella* mentions here nine different ſorts of figs; they take their names either from the perſons who firſt cultivated them, or delighted moſt in them; the places where they abounded moſt, or grew in greateſt perfection; or from their colour, ſhape, *&c.* Moſt part of them have been already mentioned in the fifth book, except three or four; *viz.* the *Chelidonian*, ſo called from χελιδὼν, a *ſwallow*; either becauſe ſwallows feed on them, or, as ſome ſay, becauſe they are ripe about the time the ſwallows depart; but this does not agree with what *Pliny* ſays, *lib.* xv. *c.* 18. that it ripens the laſt in the Winter-

And *Chelidonians* of a purple hue,
And the *Mariſcans*, which are fat and plump;
And *Calliſtruthian*, which with roſy ſeed
Does ſmile; the *white*, which of the yellow wax
The ſurname keeps; and *Libyan*, chanell'd round;
The *Lydian* alſo with its painted back.
But, when ſlow-footed *Vulcan*'s (21) ſacred rites
Have duly been perform'd, and clouds begin
To riſe, and rains hang hovering in the air,
Then is the *turnep* (22) ſown, which *Nurſia* ſends
From her renowned fields; and *navews*, brought
From the well-manur'd *Amiternian* lands.
But anxious *Bacchus*, now the grapes are ripe,
Requires our cares, and our attendance waits,
And all our well-dreſt gardens bids us ſhut;
We ruſtics ſhut them, and without delay,
Dear *Bacchus!* (23) we, ſubmiſſive, thy commands
Obey: we own thy empire, and with joy
Thy gifts we gather, and, reviv'd, we toſs

Winter-time. *Columella* ſays they are of a purple colour. The *Mariſcan fig* is ſo called, perhaps, from its ſtrong robuſt quality: ſome think they ought rather to be called *moriſcæ*, from μωρὸς, *fatuus*, becauſe *Martial* calls them *fatuas mariſcas*, becauſe of their inſipid diſagreeable flat taſte: the *Italians* call it *fico lardare*, it being exceeding large and fat. They uſed to dry them in the Sun, and keep them for the ſervice of the whole year; *albaque quæ ceræ*. *Pliny* calls theſe *albicerata*, from the reſemblance they bear in their colour to white bees-wax.

(21) *Vulcan*, according to the Mythologiſts, was the ſon of *Jupiter* and *Juno*. They tell us, that his father, once in an angry fit, threw him headlong out of heaven, down to the iſland *Lemnos*; and that by his fall he contracted a lameneſs; for which reaſon they call him *tarpides*, and by the *Greeks* he is called κυλλοποδίων, and κυλλοῦπὸς, and χωλοῦπὸς· and they frequently make themſelves very merry with the misfortunes and adventures of this lame divinity. His feaſt was celebrated in the month of *Auguſt*.

(22) *Rapum*, a turnep, by the *Greeks* called γογγύλη, from its round figure. *Napus*, a navew, by them called βυνίας, from βυνὸς, an hill, perhaps becauſe they were planted on riſing grounds. Our author ſays, that the firſt grew out into a broad belly, and the ſecond did ſtrike its ſmall root downward. The turneps of *Nurſia*, a town of the *Sabines*, as *Pliny* ſays, were moſt eſteemed both for their bigneſs and ſweetneſs; but the navews of *Amiternum*, a town in *Campania*, according to our author, were the beſt.

(23) *Bacchus*, as every body knows, was reckoned the Inventor of Wine, and by the heathens numbered amongſt their gods, and worſhipped: amongſt other names he was called *Manalus*, as ſome ſay, from a mountain in *Arcadia*, where he had a temple, and was worſhipped. *Euſebius*, *de Præparatione Evangelii*, ſays he was called *Manolos*, *quaſi totus furens*, which is a name more ſuitable for him: his ſacred rites were called *orgia*, as the ſame author thinks, ἀπὸ τῆς ὀργῆς, becauſe of the madneſs and fury wherewith his prieſts celebrated his feſtivals: his prieſteſſes were called *Manades*, ἀπὸ τῆ μαίνεσθαι, from the madneſs of their behaviour alſo at the ſame time. He is alſo called *Lyæus*, from λύειν, *to diſſolve*, becauſe wine diſſolves cares; and *Lenæus*, ἀπὸ τῆ ληνῆ, becauſe he preſided over the wine-preſs: all which names our author has diſtinctly expreſſed in a few lines.

Our

Our arms, enfeebled with ſtale wine: 'midſt crouds
Of wanton *Satyrs*, *Fauns*, and *Pan* himſelf,
With double form, we thee invoke and praiſe,
Who dwell'ſt in *Mænalus*, who all our cares
Diſſolv'ſt; thee, Father *Bacchus!* who preſid'ſt
O'er the wine-preſs, we to our homes invite,
That in our vats the grape's preſt juice may work,
And all our tuns with much *Falernian* fill'd,
And richeſt muſt, may foam and overflow.
Thus far, *Silvinus*, I've eſſay'd to teach
The culture of the ground, and to relate
The precepts which our heav'nly *Maro* taught,
Who firſt the antient fountains to unlock
Adventur'd, and through all the *Roman* towns
His rural verſe, like *Aſcra*'s Poet (24), ſung.

(24) *Aſcræum carmen.* *Heſiod*, a very antient Poet, probably as old, if not older than *Homer*: he was of *Aſcra* in *Bœotia*, and was therefore called *Aſcræus vates*. He wrote of Husbandry in verſe: *Virgil* imitated him, and therefore he called his *Georgics* *Aſcræum carmen*.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

BOOK ELEVENTH.

CHAP. I.

What things ought to be done within the Manor-houſe, by a Man advanced to, and intruſted with the Office of a Bailiff.

CLAUDIUS, a fellow of the college of *Auguſtus*'s prieſts (1), a youth of as ingenuous a natural diſpoſition, as of excellent learning, incited by the diſcourſes of ſeveral learned men, and eſpecially of ſuch as are ſkilful in Huſbandry, has, by his importunity, engaged me to compoſe a treatiſe of the Culture of Gardens, in proſe: nor indeed was I miſtaken, as to this event of the matter, when I reduced the foreſaid ſubject to the laws of verſe. But as you, *Publius Silvinus*, ſtill perſiſted to aſk a taſte of my verſification, I had not

(1) *Claudius Auguſtalis.* The Emperor *Tiberius* inſtituted a college of prieſts, 21 in number, to the honour of the *Julian* family, as he pretended; and, as they had ranked *Auguſtus* among their gods, theſe prieſts were appointed to celebrate the ſacred ceremonies they performed to this new divinity: *Claudius*, who was afterwards Emperor, was, as *Suetonius* ſays, by a vote of the Senate, added to their number, contrary to the uſual way of election, which was by lot. It is very probable, that this *Claudius*, mentioned here by *Columella*, is the ſame who was afterwards Emperor, who, in the beginning of the reign of *Tiberius*, might properly enough be called *adoleſcens*, being but about 24 years old, for he died aged 64: he reigned 13 years, 8 months, 28 days; ſo that he was about 50 years old when he began to reign; from which if we ſubtract 22 years that *Tiberius* reigned, there remain 24, the age of *Claudius* when *Auguſtus* died; and we may find ſome above that age called *adoleſcentes* by claſſical authors. From this we may conclude, that *Columella* wrote this book either in the latter end of *Auguſtus*'s reign, or in the beginning of that of *Tiberius*.

power to deny you, intending preſently afterwards, if it ſhould be acceptable to you, to do that which I am now undertaking; *viz.* to ſubjoin the buſineſs of a Gardener to the offices of a Bailiff: which tho' I ſeemed, in ſome meaſure, to have fully done in the firſt book of Huſbandry; nevertheleſs, becauſe our friend of the college of *Auguſtus*'s prieſts has frequently, with earneſtneſs, demanded it of me, I have exceeded the number of books, which I had now almoſt completed, and have publiſhed this eleventh book of the precepts of Huſbandry.

It is proper, that a Bailiff, who has the charge of your land and family committed to him, ſhould be neither in the firſt, nor in the laſt ſtage of life: for the ſervants deſpiſe a novice as much as they do an old man; becauſe the former is not as yet acquainted with rural affairs, and the latter is not now in a condition to manage them; and youth makes the one negligent, and old age the other ſlow and unactive; therefore a middle age is the fitteſt for this office: and, if accidental defects and indiſpoſitions of body do not happen, from thirty years old to ſixty, he may be able to perform all the offices of an able and ſufficient Huſbandman.

But whoever he be, that ſhall be deſtinated to this buſineſs, he muſt be very knowing, and exceeding robuſt, that he may teach thoſe that are under his command, and that he himſelf may eaſily do what he commands: for, indeed, nothing is either taught or learned rightly, without an example; and it is beſt, that a Bailiff be the maſter of the Labourers, and not their ſcholar; conſidering what *Cato*, who was an example of the manners of antient times, did ſay, *That a Maſter is ill dealt by, whom his Bailiff teaches.* Therefore in *Xenophon*'s *Oeconomic*, which *Marcus Cicero* tranſlated into *Latin*, that excellent man *Iſchomachus* the *Athenian* (2), being aſked by *Socrates*, whether he uſed, when the affairs of his family required it, to purchaſe a Bailiff in the market, as he did a common Handicrafts-man, or to train him up himſelf; I myſelf, ſays he, inſtruct him: for he, who, in my abſence, is ſubſtituted in my room, and ſucceeds as my deputy, to ſupply my diligence, ought to know ſuch things as I myſelf know. But theſe things are too antient, and, indeed, belong to that time wherein the ſame *Iſchomachus* denied, that there was any man ignorant of acting the part of an Huſbandman. But let us,

(2) *Iſchomachus*. It is no matter whether this was a fictitious or a real perſon: he is introduced by *Xenophon* as diſcourſing with *Socrates* about the management of domeſtic affairs; where we have many wiſe precepts of œconomy put into his mouth by that noble and ingenious antient author, many of which are here mentioned by *Columella*.

who

who are mindful of our own ignorance, commend to the care of the moſt ſkilful Huſbandmen ſuch young men, as are of a quick and lively apprehenſion, and of a robuſt body; by whoſe inſtructions, if it were but one out of many (for it is a difficult thing to inſtruct perfectly) may attain to the knowledge, not only of acting the part of an Huſbandman, but of commanding alſo: for there are ſome, who, tho' they are moſt excellent and approved workmen, and underſtand all kinds of work, having very little prudence and ſkill to command, ruin their Maſters affairs, by acting either with too much cruelty, or with too much lenity alſo. Wherefore, as I have ſaid, the future Bailiff muſt be taught, and, from the time he is a boy, hardened in rural buſineſs and labour, and, by many trials, be firſt narrowly examined and looked into; not only whether he has throughly learned, and attained to the knowledge of rural diſcipline, but, alſo, if he is honeſt and faithful to his Maſter, and has a real good will and affection to him, without which the Bailiff's greateſt knowledge is of no advantage.

But the chief and principal thing, in this kind of maſterſhip, is to know and to judge rightly, what ſort of office, and what ſort of labour, is to be aſſigned and injoined to every one in particular: for even the ſtrongeſt cannot execute what is commanded, if he be ignorant of what he is doing; nor the moſt ſkilful, if he has not ſtrength: ſo the quality of every thing muſt be conſidered; becauſe there are ſome works that require ſtrength only, ſuch as removing weighty things, and carrying burdens; ſome require ſtrength and art united, as digging and plowing, and cutting down corns and meadows; to ſome leſs ſtrength, and more art, is applied, as to the pruning and graffing of vineyards: alſo knowledge is of moſt account in ſome things, as in feeding of cattle, and giving them medicines: of all which offices the Bailiff, whom I have already mentioned, cannot be a right judge, unleſs he be alſo ſkilful, that, in every thing whatſoever, he may be able to correct what is done amiſs: for it is not enough, that he has reproved one that has done a fault, if he does not teach him the way to do right. Therefore I am willing to ſay the ſame thing over again: it is as neceſſary, that one, that is to be a Bailiff, be taught, as one that is to be a Potter, Carpenter, Maſon, or any trade whatſoever: and I would not take upon me to determine, whether theſe trades are not ſo much the more expeditiouſly learned, inaſmuch as they are of leſs compaſs. But the ſubject-matter of Agriculture is great and diffuſe; and, if we would fully enumerate all its parts, we could ſcarcely number them. Wherefore I cannot enough admire, which

I very juſtly complained of in the firſt book of my writings, that of the other arts, which are leſs neceſſary for life, there were found Maſters and Teachers; but of Huſbandry, there were neither Scholars nor Teachers to be found, unleſs the greatneſs of the ſubject has begotten an awe and reverence, either of learning or profeſſing a ſcience which is almoſt boundleſs, when notwithſtanding it ought not therefore to have been neglected, by baſely deſpairing of it. For neither is the art of Oratory deſerted, becauſe a perfect Orator has no-where been found; nor Philoſophy, becauſe there is no man of conſummate wiſdom; but, on the contrary, very many men encourage themſelves at leaſt to learn ſome parts of them, altho' they cannot underſtand them all: for what juſtifiable reaſon is that of being intirely ſpeechleſs, becauſe you cannot be a perfect Orator; or to be driven to ſloth and idleneſs, becauſe you deſpair of wiſdom? for it is no ſmall glory to have had a ſhare of a great thing, how little ſoever you may have poſſeſſed of it.

Who therefore, ſay you, ſhall teach him that is to be a Bailiff, if there is no Profeſſor? And I myſelf know very well, that it is a moſt difficult thing to attain to the knowledge of all the precepts of Huſbandry from one author, as it were: nevertheleſs, tho' you will ſcarcely find any one man throughly acquainted with the whole art, yet you may find many that are maſters of parts of it, by whom you may be able to form a complete Bailiff. For there is both ſomebody to be found who is a good Tiller of the ground, and an excellent Digger, or Mower; as alſo a good Planter and Dreſſer of trees, and a Vine-dreſſer; as alſo a Farrier, and a very good Shepherd or Herdsman; and none of theſe will refuſe to communicate the principles of their knowledge to one that deſires it.

Therefore let him, who is formed and inſtructed by the knowledge and ſkill of ſeveral Huſbandmen, and who ſhall take upon himſelf the office of a Bailiff, avoid, in the firſt place, the familiar and intimate converſation of thoſe of the family, and much more that of ſtrangers. Let him be very abſtemious with reſpect to wine and ſleep, both which are very great enemies to diligence: for as a drunkard impairs his memory, ſo he becomes remiſs and careleſs in his office; and very many things eſcape one that is given to ſleep: for what can he either do himſelf, or command any other, when he is aſleep? Alſo let him have an averſion to venereal amours, to which if he once give up himſelf, he will not be able to think of any other thing whatſoever, but that which he loves: for his mind, being inveigled and bewitched with vices of this ſort, thinks that there is neither any reward

reward more agreeable than the gratification of his luſt, nor puniſhment more grievous than the being deprived of what he deſires, and is fond of.

Therefore let him be firſt awake, and up in the morning, before any other body; and, according to the ſeaſons of the year, let him bring out the ſervants to their work quickly, who are always for lingering and delaying to go to it; and let him march at their head himſelf, and ſhow himſelf active and forward: for it is of very great importance, that ſuch as labour the ground ſhould begin their work as ſoon as the morning begins to dawn, and not through idleneſs and lazineſs proceed ſlowly in it: for, as the ſame *Iſchomachus* beforementioned ſays, I would rather have the ſervice and labour of one active and induſtrious man, than that of ten men who are negligent and ſlow; for it occaſions a great deal of miſchief, if labouring men have liberty to trifle away their time wantonly (3). For as in going a journey, the man, who always goes on, and does not loiter and ſtop by the way, frequently comes by one half ſooner to the end of his journey, than he, who, having ſet out at the ſame time, ſought after, and amuſed himſelf with the ſhades of trees, the delightfulneſs of ſprings, or the refreſhing coolneſs of the air; ſo, in the buſineſs of Agriculture, it can ſcarcely be told, how much an aſſiduous conſtant labourer is preferrable to one that is ſluggiſh, and a loiterer. Therefore it is neceſſary, that the Bailiff take care, that all the ſervants, as ſoon as it is light, go forth to their work, not in a dilatory languiſhing manner, but that with vigour, and chearfulneſs of mind, as if they were going forth to ſome battle, they boldly follow him, marching at their head as their Captain; and let him frequently encourage and chear them up, while they are actually at work: and ſometimes, as if he were going to aſſiſt him that is flagging and fainting, let him, for a little while, take the iron-tool out of his hand, and do his buſineſs; and admoniſh and direct him, that it ought to be done ſo, as he himſelf has vigorouſly done it.

And in the evening, when the twilight is come, let him leave no body behind him; but let him march after them all, like a good Shepherd, who ſuffers none of the cattle in his flock to be left in the field. Moreover, when he comes under the roof, let him do the ſame thing that that careful Shepherd does; and not preſently ſhut up and hide himſelf in his apartment, but take as much care of every

(3) *Meretricandi.* Some divide this word into two; and thus it ſignifies, *to paſs the time with mere trifling*; if it is to be read in one word, it ſignifies, *following after lewd women*: but the firſt ſeems to be the true reading.

body

body as poſſibly he can. Or, if there be any body (as it often happens) wounded, or that has received hurt in doing his work, let him apply ſomething to aſſwage his pain; or, if there be any other in a more weak and languiſhing condition, let him preſently convey him to the infirmary, and give orders, that every other thing, convenient and neceſſary for his cure, be given him. But, of thoſe who are in a good ſtate of health, no leſs care muſt be taken, that their meat and drink be given them without fraud, by thoſe who have the charge of the proviſions. And let him always accuſtom the Ruſtics to eat their meals in their Maſter's houſe, and by the fire appointed for the uſe of ſervants; and let him eat his own meals within their view, and be an example of frugality to them: neither let him ſup leaning upon a couch, except upon ſolemn holidays; and let him ſo celebrate the feſtivals, as to beſtow ſome largeſs upon the ſtouteſt and moſt active and frugal among them: and let him ſometimes admit them to his own table, and vouchſafe to confer ſome other honours alſo upon them.

Let him alſo, upon idle days, review all the implements of Huſbandry, without which no work can be done; and frequently examine, look into, and review the iron-tools: and let him always purchaſe them double; and, having mended and repaired them from time to time, let him keep them ſafely, that ſo, if any of them be damaged while they are at work with them, there may be no neceſſity of borrowing of a neighbour; for there is more loſt by diverting the ſervants from their buſineſs, than the price of ſuch things amounts to.

Let him keep the family rather neatly and profitably, than delicately cloathed; that is, well fenced againſt, and defended from the colds and rains; both which are beſt guarded againſt by coats of ſkins with ſleeves, and frocks with hoods: and if this be done, they may endure any winter-day whatſoever, when they are at work. Wherefore he ought to review, and count over, as well the ſervants cloaths as the iron-tools, as I ſaid before, twice every month: for a frequent reviewing and taking an inventory of them, neither affords hope of impunity, nor room for committing a fault. Therefore he ought daily to call by name all the ſlaves which are in bonds, and which are condemned to priſon, or the houſe of correction (4), and examine if

(4) After the *Romans* had conquered *Italy*, and many other countries, the moſt powerful amongſt them got poſſeſſions of lands into their own hands, contrary to the laws formerly made for reſtraining them from poſſeſſing above 500 jugera at moſt: but they frequently eluded theſe laws, and, under fictitious names, purchaſed, or, by other means, got into their poſſeſſion, vaſt tracts of land, which they either let to others at a certain rent,

if they are carefully fettered; as alſo if the place where they are in cuſtody be well ſecured, and ſtrongly fortified: neither let him, if either his Lord, or he himſelf, has put any body in fetters, looſe them from their bonds, without the Maſter of the family's expreſs command: let him not know what it is to offer ſacrifices, but by his Lord's direction. He ſhall never willingly know, or have any acquaintance with any Diviner (5), or Sorcereſs, both which ſorts of people diſturb ſimple and ignorant minds with vain ſuperſtition.

He ſhall not frequent the town, nor any fairs and markets, but in order to ſell or buy ſome neceſſary thing. Neither ought he to go out of the bounds of his own colony or farm, nor by his abſence give the ſervants opportunity and time to leave off working, and commit miſdemeanours. Let him hinder all new paths, or new limits, to be made in the land. Let him very rarely receive and entertain any ſtranger, except it be his Maſter's intimate friends. Let him not make uſe of his fellow-ſervants for any ſervice of his own, nor allow any (except great neceſſity ſhall force him) to go out of the bounds. Let him not make uſe of his Maſter's money, either for buying cattle, or any other thing to ſell again: for this thing diverts and withdraws the Bailiff's care from his proper buſineſs, and makes him rather a Trader than an Huſbandman; and never ſuffers him to balance accounts with his Maſter, and pay him what he owes him: but, when he is required to tell down the money, inſtead of the caſh, the goods are produced.

rent, or cultivated them by vaſt numbers of ſlaves, which they conſtantly employed and kept at their villas, where they commonly built an houſe they called *ergaſtulum*, which, according to its etymology, ſignifies a *work-houſe*, but was really a priſon: it was moſtly built under-ground, with ſmall windows, and well ſecured; there they confined their ſlaves, ſometimes only in the night-time, and then led them out to work in the day-time. But our author ſeems to intimate, that they were deſigned for naughty ſervants, who were confined there as a puniſhment for crimes they had committed; and, no doubt, were condemned to hard labour; as grinding of corn, beating of hemp, *&c.* To theſe places alſo they commonly confined, in the night-time, ſuch of their ſlaves as they ſuſpected were inclined to run away. Theſe private priſons, as has been already ſaid, were ſo much abuſed in after-times, that ſeveral Emperors thought fit to aboliſh them; it having been found, that ſeveral innocent perſons, and even freemen, had been trepanned into them, and kept as ſlaves therein, by the tyrannical and oppreſſive proprietors of the ſame.

(5) *Aruſpex*, a Diviner: their buſineſs was to look into the entrails of their ſacrifices; and from the appearances they made, *viz.* if the parts were ſound and intire, or decayed, or not in their natural poſition, or from the appearance of the flame when they were burning, *&c.* to foretel good or bad ſucceſs, *&c.* They were once in great eſteem at *Rome*, and their diſcipline, which was brought from *Tuſcany*, was greatly reverenced by the *Romans*: but, it ſeems, our author had no great opinion of them, and looked upon them as a pack of deceivers; and adviſes a Bailiff not to be acquainted with any of them.

Therefore

Therefore he muſt be obliged to avoid this, as much, indeed, as an inclination for hunting and fowling is to be avoided; by which things very many ſervants are taken away from their proper buſineſs.

Alſo, he ought carefully to conſider and obſerve thoſe things, which with difficulty are obſerved in greater governments, that he deal neither too cruelly, nor too remiſsly, with thoſe that are ſubject to him; and that he always cheriſh the virtuous and the diligent, and alſo ſpare ſuch as are not ſo good and dutiful as they ought to be; and that he uſe ſuch moderation, that they may rather be afraid of his ſeverity, than deteſt and abhor his cruelty. And it will be in his power to guard againſt and prevent this, if he rather chooſe to uſe precautions, that the Labourer may not commit a fault, than to puniſh him in the evening after he has committed it: for there is no ſurer guard can be ſet even upon the naughtieſt man living, than the daily exacting a certain taſk of him: for that famous ſaying of *Marcus Cato* is as true as an oracle, *That by doing nothing men learn to do evil.* Therefore the Bailiff muſt take care, that the taſks be performed; and theſe things he will with no great difficulty obtain, if he always make his appearance, and ſhew himſelf: for thus the Overſeers of every particular ſort of buſineſs will diligently execute their offices; and the ſervants, after having been kept hard at work, being tired, will rather ſet their minds upon their victuals, and upon reſt and ſleep, than upon doing of miſchief.

Moreover, in every thing relating to Huſbandry, and in all rural affairs whatſoever, as in all other affairs of life, the moſt valuable thing of all is, that every man ſhould be ſenſible, that he is really ignorant of what he knows nothing of, and be always deſirous to learn what he is ignorant of. For, tho' knowledge is of great advantage, nevertheleſs imprudence, or negligence, does more hurt than it, *viz. knowledge*, does good; eſpecially in Huſbandry, of which art the principal point is to have done, once for all, whatever the nature and method of the culture ſhall require to be done: for altho' what is done amiſs, either through negligence or imprudence, may ſometimes be mended; nevertheleſs, the Owner has already ſuſtained a preſent loſs: nor can the thing afterwards yield ſuch an increaſe, as both to repair the loſs of the article that has been loſt, and make up again the advantage which would have redounded from it. Who is it that doubts how irrecoverable time is, that maketh its eſcape, and ſlideth away before our eyes? Therefore let him remember this, and always beware, above all things, that, for want of foreſight, he be not overcome by his work: for the buſineſs of Agriculture is moſt inſidious, and

and apt to deceive a dilatory man: which very thing *Heſiod*, a moſt antient author, has more expreſsly intimated in this verſe (6),

'The man, who, full of doubts, delays his work,
'With loſſes always wreſtles.'

Wherefore let the Bailiff be of opinion, that that common ſaying, which Huſbandmen make uſe of, concerning the planting of trees, *viz. Do not heſitate to plant*, is to be applied to the whole culture of the ground; and believe, that not twelve hours are neglected and let paſs, but that a year is loſt, unleſs he do and finiſh preſſing buſineſs upon its own day. For ſince every thing ought to be done almoſt in its own proper moments, if one work be done later than it ought to have been done, the other parts of Culture alſo, which follow, will be entered upon too late, after their proper ſeaſons are paſt; and the whole order of the work being diſturbed, and put out of its due courſe, deprives you of the hope of the whole year. Therefore ſuch a directory, concerning the work and buſineſs of every month, as depends upon the obſervation of the poſition and influence of the ſtars of Heaven, is very neceſſary; for, as *Virgil* ſays (7),

'With as much care we muſt obſerve the ſtars,
'*Arcturus*, and the *Kids*, and gliſt'ring *Snake*,
'As they, who, homeward-bound, through ſtormy waves
'Of th' *Euxine* ſea, *Abydus'* narrow chops,
'Where breeds the purple-fiſh, attempt to paſs.'

Againſt which obſervation I do not deny I have diſputed with many arguments, in thoſe books which I wrote againſt Aſtrologers. But, in theſe diſputations, inquiry was made into the truth of that which the *Chaldeans* moſt impudently affirm as a thing certainly to be depended on, That the changes of the air anſwer to certain ſtated days, as if they were confined within certain bounds. But, in this rural diſcipline, ſuch ſcrupulous niceneſs is not required: for the prognoſticating the future weather, tho' it be done but groſly and inartifi-

(6) *Heſiod*, Epſ. 2. 31.
(7) *Virg. Georg. lib.* i. 204.
The antients, as has been already ſaid, were of opinion, that the riſing and ſetting of ſeveral ſtars had a mighty influence upon all the fruits of the ground, and ſome of them they looked upon as mighty pernicious; for which reaſon *Pliny* calls them *horrida ſidera*, as *Arcturus*, *Orion*, and the *Kids*, which they thought always produced ſtorms and tempeſts.

cially, as they ſay, and not with that exactneſs as might be wiſhed, yet will be of as great advantage to the Bailiff as you can deſire, if he be fully perſuaded, that the ſtar will have its due force and influence, ſometimes before, ſometimes after, and ſometimes alſo upon the very day when it riſes or ſets: for that man will be provident enough, who ſhall have it in his power to take precautions, and ſecure himſelf ſeveral days before, againſt ſuſpected weather.

CHAP. II.

What muſt be done every Month, by accommodating all Sorts of Work to the Times and Seaſons.

THerefore we ſhall give directions what muſt be done every month (1), ſo accommodating rural buſineſs to the times and ſeaſons, as the ſtate of the weather will allow; of the variety and changes

(1) The antients were great obſervers of the heavenly bodies, and, from their obſervations, they formed to themſelves certain rules for their guidance and direction in all the different parts of Agriculture: they not only conſidered the riſing and ſetting of certain conſtellations, and particular ſtars, as indications and ſigns when to begin plowing, ſowing, and other works of Husbandry, but they thought, that they had great influence over the temperature of the air, and the fruitfulneſs of the earth: and tho', at firſt, they only took notice of them as ſigns pointing out the times of the year, when heat or cold, drineſs or moiſture, are uſually predominant; yet, in proceſs of time, many began to look upon them as the cauſes of theſe qualities. But *Columella* was ſo far from attributeing ſo great virtue to the ſtars, that he compoſed ſome books againſt thoſe Aſtrologers, who pretended certainly to foretel the changes of the weather: and all that he pretends in this chapter is, to warn Husbandmen to be conſtantly upon their guard; becauſe, from a long ſeries of obſervations, made both by himſelf and others, there was reaſon to expect, that ſuch and ſuch changes of weather would happen about the riſing or ſetting of ſuch and ſuch ſtars, not always indeed upon the very ſame day, but ſometimes before, ſometimes after: accordingly, in this chapter, he gives an account of the riſing and ſetting of ſuch of them as he thought neceſſary to be known for the purpoſes of Husbandry; and he has formed a calendar for the direction of Husbandmen in every part of it, throughout all the months of the year. And here it may not be amiſs, for the information of ſuch as are unacquainted with ſuch things, to tell them, that the antient Aſtronomers, in order to aſſiſt the memory to retain the number and diſpoſition of the ſtars, and to enable themſelves and others to ſpeak intelligibly of them, and communicate their thoughts to others concerning them, divided or reduced the ſtarry firmament to certain ſyſtems and collections of ſtars, or conſtellations, which they imagined or ſuppoſed to repreſent the figures of ſome real or imaginary animals, or of ſome other known viſible thing, and gave them names accordingly; moſt of which they borrowed from the fabulous hiſtories of their gods, heroes, *&c.* By which contrivance, whenever any mention is made of any of theſe conſtellations, or of any particular ſtar belonging to the ſame, ſuch as are acquainted with the celeſtial ſphere, can as eaſily turn their thoughts

changes of which, if, from this brief account, the Bailiff ſhall be forewarned, he ſhall either never be deceived, or, I am perſuaded, not very often. And, that we may not depart from our excellent Poet (2),

'When Spring begins, let him begin to till
'The ground.'

But an Huſbandman ought not to obſerve the beginning of the new Spring in the ſame manner as an Aſtronomer, ſo as to wait for that particular day, which is ſaid to begin the Spring; but let him even take in ſome part of the Winter: becauſe after the ſhorteſt day is paſt, the year begins to grow warm, and a milder day permits him to begin his works.

Therefore from the 13th day of *January*, (that he may ſhew regard to the firſt month of the *Roman* year) he may auſpiciouſly begin the ſeveral parts of every ſort of Culture, of which he ſhall finiſh ſome that have been already begun, and are not yet finiſhed, and begin others which belong to the future time. And it will be ſufficient, that every work be finiſhed towards the middle of each month: for a work diſpatched and finiſhed fifteen days ſooner than is needful, cannot be ſaid to be done too much out of ſeaſon; nor, on the other hand, can that which is done ſo much later, be ſaid to be done too late. The xiii of *January* is ſtormy windy weather, and an uncertain ſtate. The xv of *January* uncertain weather. On the xvi of

thoughts or their eyes towards them, as they can to ſuch places of the earth where they dwell, or are well acquainted with. *Columella*, in this chapter, mentions not all, but many of theſe conſtellations, and only tells us when they riſe and ſet, without any further deſcription; ſo that he ſuppoſes his readers to have ſome knowledge of the celeſtial ſphere, and which he did not think it his buſineſs to teach. But, as it is probable there may be ſome who may have the curioſity to look into this chapter, who are not very well acquainted with theſe things, perhaps it may not be unacceptable to them, to give them an imperfect hint, from *Aratus*, *Hyginus*, and ſome others, of the places of the ſphere wherein they are ſituated, and of their ſituation in reſpect of thoſe that are near them; and of the characters wherewith the twelve ſigns of the Zodiac, through which the path of the Sun paſſes, are commonly marked; and ſometimes give the reaſons of the names of the conſtellations, *&c.* and this without any order, but juſt as they are mentioned by the author: and, as the greateſt part of the *Latin* names of the Conſtellations are become familiar to our language, and are as eaſily underſtood as if they were rendered into *Engliſh*, it will not ſeem neceſſary always to tranſlate them; and, probably, it may be thought better frequently to retain them, and put the *Engliſh* names after them.

(2) *Virg. Georg. lib.* i. 43.

January the Sun paſſes into *Aquarius* (3); *Leo* (the Lion) (4) begins to ſet in the morning: a ſouth-weſt wind, ſometimes a ſouth wind, with rain. The xvii of *January*, *Cancer* (the Crab) (5) leaves off ſetting: it is cold Winter-weather. The xviii of *January*, *Aquarius* begins to riſe: the ſouth-weſt wind is the ſign of a ſtorm. The xxii of *January*, the bright ſtar in the *Harp* (6) ſets in the evening: a rainy day. The xxiv of *January* forebodes a ſtorm, from the ſetting of the Conſtellation *Priſtes* (the Whale): ſometimes alſo there is a ſtorm. The xxvii of *January*, the bright Star which is in the breaſt of *Leo* ſets: ſometimes it is a ſign, that the Winter is divided into two parts (7). The xxviii, either the ſouth, or ſouth-weſt wind blows, cold Winter-weather: a rainy day. The xxx of *January*,

(3) *Aquarius*, the Water-bearer, is the eleventh ſign of the Zodiac: it is commonly marked thus ♒, which repreſents the wavy ſurface of the water, there being a certain number of Stars in this Conſtellation ſo placed, as ſeem to have this appearance. *Aratus*, and ſome other antient Aſtronomers, have reckoned about thirty Stars in this Conſtellation. He has his feet fixed in the tropic of *Capricorn*, and ſtretches out his left-hand as far as the back of *Capricorn*, and with his right-hand almoſt touching the mane of *Pegaſus*. Some ſay, that this Conſtellation had its name in memory of *Ganymedes*, who was cup-bearer to *Jupiter*: others ſay, that it was ſo called in memory of *Deucalion*, in whoſe reign a great deluge of water happened.

(4) *Leo*, the Lion, is the fifth ſign of the Zodiac, and is marked thus ♌, which repreſents the tail of the Lion, and, as ſome ſay, is an emblem of his courage, he laſhing himſelf with his tail when he is angry: perhaps they, by this furious animal, intended to expreſs the violent heat of the Sun, at the time when the Sun enters into this ſign. He is repreſented as looking towards the weſt, and placed above the body of *Hydra*, from its head to its middle part, and divided by his middle by the tropic of *Cancer*; and as having his fore feet placed below the circle itſelf. The antient Aſtronomers reckoned about 19 Stars in this Conſtellation.

(5) *Cancer*, the Crab, is the fourth ſign of the Zodiac, drawn on the globe in the figure of a Crab: it is marked with this character ♋. The learned Dr. *Long*'s opinion ſeems very reaſonable, that the intention of the Inventor of this character was to repreſent the change of the Sun's declination from north to ſouth, by two lines drawn ſo as to point contrary ways. The circle that is parallel to the equinoctial, and paſſes through the beginning of this ſign, is called the tropic of *Cancer*, or the northern tropic, to which when the Sun comes, about the 11th of *June*, it makes the Summer-ſolſtice, and he then turns his courſe back again towards the equator: they reckoned formerly 18 Stars in this Conſtellation. It is repreſented as divided by the middle by the tropic of *Cancer*, and placed a little above the head of *Hydra*.

(6) *Fidicula* is the biggeſt ſtar in the Conſtellation *Lyra*, or the Harp: ſometimes by authors it is put for the whole Conſtellation.

(7) *Hiems bipartita*. If regard be had to the number of days, more than the half of the Winter is now paſt: but, it may be, *Columella*'s meaning is, that, with reſpect to the weather, or coldneſs of the ſeaſon, the ſetting of the bright Star in the breaſt of *Leo* ſignifies, that only the half of Winter is paſt; but the meaning of this expreſſion ſeems very dubious: however, it cannot be, that, according to the number of the days they aſſigned to the Winter, it was then divided into two equal parts.

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Delphinus (8) (the Dolphin) begins to ſet; alſo *Fidicula* (the Harp) ſets. The xxxi of *January* the ſetting of the forementioned Stars cauſes a ſtorm: ſometimes it is only a ſign of it.

We have run over this half month, and thoſe following, one after another, by taking particular notice of, and mentioning the ſtorms, that the more cautious Bailiff, (as I have already ſaid) may either abſtain from all manner of work, or make the greater diſpatch. Therefore from the xiii of *January*, which is accounted to be the time between the Winter ſolſtice and the coming of the weſtern breezes, if you have a larger extent of vineyard, or of plantations of trees for ſupporting of vines, you muſt return to prune that part which remained unpruned in Autumn, but ſo that the vine may not be wounded in the morning; becauſe the firm-wood of it being as yet ſtiff with the hoar-froſts, and the nocturnal froſts, greatly dreads the iron-tool. Therefore while you give it leave to thaw, till the ſecond and third hour of the day; the thorn- and briar-hedges may be thinned, leſt by their growth they incroach upon, and take up the land, the corns may be weeded, the rods and ſprays gathered into heaps, and, finally, wood may be cut for fuel, that ſo when the day grows warm, the buſineſs of pruning may be carried on.

In places expoſed to the Sun, and alſo in ſuch as are lean and dry, the meadows muſt now be cleanſed, and preſerved from the cattle, that there may be plenty of hay. It is alſo a proper time to till dry and fat lands; but both ſuch as are of an ouſy and of a middling habit, muſt be fallowed in Summer; but ſuch as are very lean and dry, muſt be plowed after Summer in the beginning of Autumn, and afterwards ſown. But a *jugerum* of fat land, at this time of the year, is very eaſily plowed by two labourers; becauſe the earth, being as yet wet with the Winter-rains, yields eaſily to culture. And in the ſame month, before the firſt of *February*, the corns ſown in Autumn muſt be ſarcled, whether they be of the ſeed of red-bearded huſked wheat, which ſome call our own *Italian* huſked wheat, or of common wheat: and the proper time for ſarcling them is, when the corns that are ſprung up have begun to have four blades or leaves: and they who have a Labourer to ſpare from other work, ought now at length to ſarcle the early barley alſo.

(8) *Delphinus*, the Dolphin; a Conſtellation in the northern hemiſphere: it is repreſented not far from that called the *Eagle*, with its head almoſt touching the noſe or ſnout of *Pegaſus*: it contains ten Stars: it riſes with the hinder-part of *Sagittarius*, and it ſets when the head of *Virgo* riſes: it conſiſts of ten Stars, according to the antients.

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The bean alſo requires the ſame culture, if now its ſtalk be grown up to the height of four inches: for it is not expedient to ſarcle it before, while it is too tender. It will be better for us to ſow vetches the preceding month; nor yet will it be amiſs to ſow them in this very month, or in the next: for Huſbandmen direct, that by no means they ſhould be committed to the earth in the month of *March*. It is right now to dig vineyards, which are propped and ſupported with ſtakes, and tied. Such grafts or cyons, as bloſſom firſt, muſt be preſently graffed about the 13th of the month, as thoſe of cherry-trees, *tuberes* or peach-nuts (9), almond-trees, and peach-trees. It is a fit time for making cloven vine-props, or pales on ſtakes alſo: nor is it leſs proper for cutting down trees for buildings. But both theſe things are better done when the Moon is decreaſing, from the twentieth to the thirtieth day; becauſe all wood ſo cut is thought not to be infeſted with cariouſneſs. One workman can, in one day, cut down one hundred pales or ſtakes, and lop, ſharpen, and point them: but he can cleave, chip, and plain on both ſides, and ſharpen ſixty oaken or olive vine-props. Alſo he can by candle-light in the evening make ten pales or ſtakes, and five cloven vine-props; and the like number by candle-light in the morning. If the wood be of oak, one Carpenter ought to hew perfectly well twenty feet ſquare of it, and this ſhall make one load: but if it be of pine-tree, twenty-five feet ſquare may be as expeditiouſly done by one man; and this alſo is called a load: as alſo of elm and aſh xxx feet ſquare: but of cypreſs-tree xl feet. As alſo of the fir- or poplar-tree, every ſingle workman may hew perfectly well ſixty feet ſquare; and all theſe meaſures are in like manner called loads. In theſe days alſo the early lambs, and the young of other cattle, and the larger four-footed beaſts alſo, ought to be marked with a branding iron.

The firſt of *February Fidis* (the Harp) begins to ſet: the wind is eaſterly, and ſometimes it is a ſouth-wind with hail. The iii of *February* all the *Harp*, and the half of *Leo*, ſet: the wind is north-weſt or north, and ſometimes weſt. On the v of *February* the middle parts of *Aquarius* riſe: windy ſtormy weather. The vii of *February* the Conſtellation *Caliſto* ſets (10): the weſterly winds begin to blow.

(9) *Tuberes:* a kind of fruit-tree, brought out of *Africa* in the time of *Auguſtus*. *Pliny*, *lib.* xv. *c.* 14. reckons it among pomiferous trees; and ſays that its fruit is but ſmall, and more like berries than apples. Father *Hardouin* ſays, they call them in *France peſches-noix* (peach-nuts): they are mentioned in ſome other parts of this work.

(10) *Caliſto occidit.* Antient authors call *Urſa major* (the great Bear) by this name: ſhe was, as the Mythologiſts ſay, the daughter of *Lycaon* King of *Arcadia*; and, being by

blow. The viii of *February*, windy ſtormy weather. The xi of *February* the eaſt-wind blows. During theſe days, in ſuch places as lie upon the ſea-coaſts, and are warm and dry, the meadows, or arable lands, are cleanſed, and ſet apart and kept for hay. Such parts of vineyards as were omitted, and left unfiniſhed, becauſe of the ſhorteſt day, or the colds, muſt now be propped and tied, leſt afterwards the ſwelling buds be hurt, and the eyes bruiſed and rubbed off. Alſo in the ſame places, the digging of the vineyards muſt be diſpatched and finiſhed, and both the lopping of the trees planted for the ſupporting of vines, and the binding of the vines to them, muſt be finiſhed; of which things no certain taſks can be aſſigned.

Then, between the 5th and 13th, nurſeries of apple-trees muſt be made, and the plants that are come to maturity muſt be transferred from the nurſeries to trenches. The paſtination alſo, which was begun in the month of *December*, or of *January*, muſt now be put an end to, and planted with vines. But a *jugerum* of ground, if the earth be digged down to the depth of three feet, is paſtinated by lxxx labourers in one day; or, if it be digged to the depth of two feet and an half, by L. Labourers; or if to the depth of two feet, by xl. Nevertheleſs, in dry land this is the leaſt depth that the paſtinated ground muſt have, where young ſtocks or cuttings are to be planted: for even the depth of one foot and an half may ſuffice for any kind of pot-herbs that are to be planted in it, which, for the moſt part, is diſpatched by thirty Day-labourers to each *jugerum*.

At this ſame time a part of the dung muſt be ſpread upon the meadows, and a part of it ſprinkled round the olive-trees, and other trees: as alſo nurſeries of vines muſt be carefully made, and moſt carefully planted with the very freſheſt cuttings. Now it is profitable to plant poplars, willows, and aſh-trees, before they put forth their leaves, and alſo elm-plants; or to lop ſuch as have been ſet before, and to dig round them, and cut off their uppermoſt ſmall Summer-roots. You muſt now alſo carry out of the corn-lands all the ſprays of the vines, while the vineyards are not yet digged, and the branches of the trees that ſupport the vines; or briars; and, in a

by *Diana* changed into a bear, becauſe ſhe had not preſerved her virginity, ſhe was by *Jupiter*, who had debauched her, placed among the Stars, *&c.* The ſeven principal Stars of this northern Conſtellation are commonly called *Charles's wain*, having four Stars in the form of a parallelogram, which repreſent the wheel; and three lying almoſt in a ſtraight line, which repreſent the beaſts of draught; theſe were the Stars they chiefly took notice of: but in all, the antients reckoned twenty-one Stars therein. But, as this Conſtellation does not ſet, it is probable the text is corrupted in this place, or that the author means ſome other Star by this word.

word, whatever thing is lying upon the ground, and may hinder the perſon that digs, or in any other way moves and labours the earth, and lay them to an hedge: you muſt plant new roſe-beds, or dreſs the old ones: you muſt now plant nurſeries of reeds, or cultivate the old ones alſo; and make willow-groves, or lop, weed, and dig them: and either ſow broom-ſeed, or ſet it in plants in trenched ground; or alſo in a furrow. Alſo it is not improper to ſow trimeſtrian corn in this ſeaſon; altho' in warm regions it is better to do it any time in the month of *January*.

The xiii of *February Sagittarius* (the Archer) (11) ſets in the evening: it is extremely cold Winter weather. The xiv of *February Crater* (the Cup) (12) riſes in the evening: the wind changes. The xv of *February* the Sun paſſes into *Piſces* (the Fiſhes) (13): ſometimes there is a ſtorm of wind. The xvii and xviii of *February*, it is a weſt or ſouth wind, with hail and ſhowers of rain. The xx of *February Leo* (the Lion) ceaſes to ſet: the north winds, which are called *Ornithian* (14) are wont to continue for thirty days: then alſo comes the ſwallow. The xxi of *February Arcturus* riſes in the fore-part of the night: the day is cold, with a north or north-weſt wind, and ſometimes rain. The xxii of *February*, in the twilight in the evening, *Sagitta* (the Arrow) begins to riſe: variable weather (they are called the *Halcyon* days) (15). In the *Atlantic* ſea indeed, there is obſerved to

(11) *Sagittarius*, the Archer, is the ninth ſign of the Zodiac, and it is marked with this character ♐. In old books he is repreſented as a Centaur, with a bow and arrow, in a poſture of juſt going to ſhoot: he is placed from his feet to his ſhoulders in the circle of *Capricorn*, ſo that his head ſeems to appear without the circle: his bow is divided by the *circulus lacteus*, and, according to the antients, he conſiſts of 15 Stars.

(12) *Crater*, the Cup, is a ſmall Conſtellation, conſiſting of eight Stars, placed above the firſt curvature of that great ſouthern Conſtellation called *Hydra*.

(13) *Piſces*, the 12th and laſt ſign of the Zodiack; it is commonly marked thus ♓, and, in ſome old books, it is the picture of two fiſhes tied together back to back: one of them is called the northern fiſh, becauſe it is placed between the equinoctial and the tropic of *Cancer*, under the arm of *Andromeda*, and looks towards the north: the other is called the ſouthern fiſh, and is placed in the extremity of the Zodiac, under the ſhoulders of the *Horſe*, and they are joined together with certain Stars like a ſmall line, from the firſt foot of *Aries*: the ſouthern fiſh has 17 Stars, and the northern 12; and the line of Stars that joins them are 12 in number.

(14) *Venti Ornithiæ*. *Pliny*, *lib.* 2. *c.* 47. gives an account of *Eteſian* or anniverſary winds, which, in different countries, blow from different quarters; and ſays, that when they blow from the ſouth-eaſt they are called *ornithiæ*; probably becauſe with them came ſome birds, which change countries at certain ſeaſons of the year, ὄρνις ſignifying a bird.

(15) *Halcyonei dies*. Theſe days have their names from a certain bird they called *halcyone* or *halcedo*, ἅλς τὸ ἐν ἁλὶ κυεῖν, as ſome think, becauſe it makes its neſt, and hatches its eggs in the ſea, during which time it is very calm. *Pliny* ſays, that the *Halcyon* days

are

to be the greateſt calm. The xxiii of *February* windy weather: the ſwallow is ſeen. During theſe days, in cold places, is the proper ſeaſon for the doing of thoſe things we have already mentioned; but in warmer places, altho' it is too late, nevertheleſs it is neceſſary. But this ſeems to be the beſt ſeaſon for planting cuttings and quickſets; nevertheleſs, it is not worſe between the firſt and fifteenth of the following month, provided the country be not exceeding hot: but, if it be colder, it is even better. Alſo, in moderately warm places, this will be a convenient time for graffing trees and vines.

On the firſt of *March* a ſouth-weſt wind; ſometimes a ſouth wind with hail. On the ſecond of *March Vindemiator* (the Vintager) (16) appears, which the *Greeks* call τρυγητής: northerly winds. The fourth of *March* a weſt wind, ſometimes it is a ſouth wind: it is very cold weather. The vii of *March Pegaſus* (the Horſe) (17) riſes in the morning: a blaſt of the north-eaſt wind. The xiii of *March* the northern *Piſces* leave off riſing: northerly winds. The xiiii of *March* the ſhip *Argo* (18) riſes: a weſt or a ſouth wind, ſometimes a north-eaſt wind. In theſe days it is proper to put in order, and furniſh gardens with every thing neceſſary, of which I ſhall ſpeak more particularly in their proper place, leſt, in this croud, as it were, of different ſorts of buſineſs, I ſhould ſeem to have deſcribed ſomewhat too negli-

are about the time of the Winter-ſolſtice, and that about ſeven days before that time they make their neſts, and hatch their eggs about ſeven days after, and then the ſea is calm and navigable: he ſays alſo, that this bird is a little larger than the ſparrow; the greateſt part of it of a bright azure colour, with ſome purple and white feathers intermixed, with a ſmall long neck, and is ſeldom ſeen but at the ſetting of the *Pleiades*, and about the time of the Solſtices; ſo that, in the opinion of ſome, it is not what is commonly called the *King's fiſher*. *Geſnerus* thinks, that theſe words are an addition to the text, and not originally of the author, but added as an explication of the text: perhaps the author only meant, that they were only like the halcyon days becauſe of their calmneſs: tho' they were not the Halcyon days properly ſo called; for both *Ariſtotle* and *Pliny* ſay, that they were ſeven days before, and as many after, the Winter-ſolſtice.

(16) *Vindemiator*, τρυγητής, by others called *protrygeter*, becauſe it riſeth a little before the vintage begins. It is a fixed Star of the third magnitude, in the right wing of *Virgo*. *Ovid, lib.* iii. *Faſt.* mentions this Star; and tells us, that a certain boy, beloved of *Bacchus*, being killed by a fall from a tree when he was gathering grapes, was tranſlated in o Heaven, and transformed into this Star.

(17) *Pegaſus*, the Horſe; a Conſtellation of the northern Hemiſphere, conſiſting of 23 Stars: he is repreſented as looking to the *Arctic* Circle, and with his feet leaning upon the Tropic of *Cancer*, and ſeems to touch the *Dolphin* with the extremity of his mouth, and with his neck as joining the right-hand of *Aquarius*.

(18) *Argo*, the ſhip; a Conſtellation of the ſouthern Hemiſphere, conſiſting, according to the antient Aſtronomers, of 23 Stars: with its hinder part it touches the Tropic of *Capricorn*, and with its under part the tail of *Canis major*; and then bends towards the *Antarctic* Circle, which it touches: it ſets when *Sagittarius* and *Capricorn* ariſe, and riſes with *Virgo* and *Libra*.

gently the offices of a Gardener, or to have interrupted the order of the other ſorts of culture, which I have now begun. Therefore from the firſt to the xxiii of *March* is an excellent time for the pruning of vines, if, nevertheleſs, the buds do not as yet move themſelves. This is alſo the principal time for chuſing, to beſt advantage, cyons that have not begun to bud, in order to graft withal; and it is now by far the very beſt time for grafting both vines and trees. Alſo, in cold and moiſt places, now is the principal time for planting of vines: alſo the tops of fig-trees, that are now ſwelling, are ſet to moſt advantage. Alſo this is an excellent ſeaſon for ſarcling corns a ſecond time: one Labourer ſarcles very well, in one day, as much corn-land as three *modii* will ſow.

Now is the proper time to cleanſe meadows, and to defend and ſecure them from cattle: in warm and dry places indeed, that ought to be done even from the month of *January*, as we ſaid above; for in cold places it is ſoon enough to ſhut up meadows, and ſet them apart, for growth, at the feaſt of *Minerva* (19): at this time you muſt prepare all the trenches wherein you deſign to plant trees in autumn; if the ground be convenient, and eaſy to work, one man may make xiiii of them of four feet every way; but xviii when they are three feet. But for planting of vines, or trees of no great growth, a furrow one hundred and twenty feet long, and two feet in breadth, ought to be ſunk to the depth of two feet and an half, and one Labourer will make it in one day. Now it is time to have finiſhed the digging and dreſſing of your lateward roſe-beds: now it will be proper to pour lees of oil, which have no ſalt in them, round the roots of olive-trees that are in a bad ſtate; ſix *congii* ſuffice for the greateſt trees, and an *urn* for thoſe of a middling ſize; for the reſt a proportional quantity muſt be allotted. But even thoſe which have no defect will thrive ſo much the better, if they be watered with lees of oil-olive that have no ſalt in them. Some have ſaid, that this is the beſt time for inſtituting and forming of nurſeries, and alſo have directed to ſow laurel and myrtle-tree berries, and the ſeeds of other green things here and there, in ſmall beds and gardens. The ſame perſons alſo have given it as their opinion, that the ſtiff upright ivies, and other ivy-trees, muſt be planted ſoon after the xiii of *February*, or the firſt of *March* alſo.

(19) *Quinquatribus.* *Quinquatria* were feaſt-days inſtituted in honour of *Minerva*; ſo called, as *Ovid* ſays, becauſe they laſted five days; or, as others, becauſe celebrated the fifth day after the ides of *March*, about the 19th or 20th of this month.

Upon

Upon the xv of *March Nepa* (the Scorpion) begins to ſet, and is the ſign of a ſtorm. The xvi of *March Nepa* (the Scorpion) ſets: very cold weather. The xvii of *March* the Sun paſſes into *Aries* (the Ram) (20): a weſt or north-weſt wind. The xxi of *March* the *Horſe* ſets in the morning: northerly winds. The xxiii of *March Aries* begins to riſe: a rainy day; ſometimes it ſnows. The xxiv and xxv of *March*, the vernal Equinox is the ſign of a ſtorm. From the fifteenth the ſame things, above-mentioned, muſt certainly be finiſhed. Now, and not before, is the beſt time for tilling ouſy and fat places: and ſuch places as we fallowed in the month of *January*, muſt be twifallowed in the latter end of *March*; and if there be any arbours of generous vines, or any ſingle trees married to vines, either in the fields or thickets, left by the Pruner, they ought certainly to be pruned before the firſt of *April*; after which day the culture of ſuch ſort of things will be too late and fruitleſs. Alſo this is the firſt time for ſowing millet and panic, which ought to be finiſhed about the xiii of *April*: five *ſextarii* of each ſeed take up one *jugerum*. Alſo it is the fit time for caſtrating woolly cattle, and other fourfooted beaſts: but in warm places, it is a right time for caſtrating all cattle whatſoever, from the xiii of *February* till the xiii of *April*; and in cold places, from the xv of *March* till the xv of *May*.

The firſt of *April*, *Nepa* (the Scorpion) ſets in the morning: it ſignifies a tempeſt. The v of *April*, a weſterly or ſouth wind with hail: ſometimes this ſame thing happens the day before. The vi of *April* the *Pleiades* (21) are hid in the evening: ſometimes it is winter weather. The vii, viii, and ix of *April*, the ſouth and ſouth-weſt

(20) *Aries*, a Conſtellation, drawn on the globe in the figure of a Ram; it is the firſt of the 12 ſigns of the Zodiac, and marked thus ♈. He is repreſented as ſtanding in the Equinoctial Circle, with his head turned to the eaſt, and his riſing head is placed below the Triangle, and with his feet almoſt touches the head of the Whale: it conſiſts of 18 Stars. The Sun enters this Sign about the 10th of *March*, old ſtyle, and makes the vernal Equinox, his apparent diurnal motion being then in the Equator, when the night and day are equal over the face of the whole earth. It is reckoned the beginning of the aſtronomical year, becauſe it is the entrance into the Spring, when the face of the earth is renewed, and the vegetables, that grow thereon, recover from the languiſhing ſtate into which they were thrown by the coldneſs of the Winter; and many of them, which ſeemed to be intirely dead, riſe again, as it were, and recover a new life; and the animals, which ſeemed to decline apace, and tend towards a diſſolution, by the returning of the warmth of the Sun, have new vigour and life communicated to them: from that time the Sun appears to decline more and more towards the north, till the Summer begins about the 11th of *June*. It is probable, that the antients intended, by this prolific animal, to repreſent the genial fertilizing warmth of the Sun in the Spring.

(21) *Pleiades*, by the *Romans* called *Vergiliæ*, are a cluſter of ſmall Stars in the neck of the *Bull*: theſe have been already mentioned in the ix^th^ and x^th^ books.

winds ſignify a ſtorm. The x of *April*, when the Sun riſes, *Libra* (the Balance) begins to ſet: ſometimes it is a ſign of a ſtorm. The xii of *April*, the *Hyades* (22) are hid: it is exceeding cold, as in Winter. In theſe days the firſt digging of vineyards, in cold places, muſt certainly be finiſhed before the xiii; and ſuch things as ought to have been done in the month of *March*, after the equinox was paſt, muſt now, at length, be done as ſoon as poſſible. It is yet a right ſeaſon to ingraft fig-trees and vines: nurſeries, which are made before, may be, as yet, very conveniently weeded and digged. *Tarentinian* ſheep ought to be waſhed with ſoapwort-root (23), that they may be prepared for ſhearing.

The xiii of *April Libra* (24) ſets, as above: it is very cold. The xiiii of *April*, a ſtorm of wind and ſhowers; nor does this conſtantly happen. The xvii of *April* the *Sun* paſſes into *Taurus* (the Bull) (25): it is a ſign of rain. The xviii of *April* the *Hyades* hide themſelves in the evening: it is a ſignification of rain. The xxi of *April* divides the Spring into two parts (26): it is rain, and ſometimes hail. The xxii of *April*, the *Pleiades* riſe with the Sun: a ſouth-weſt or ſouth wind; a moiſt day. The xxiii of *April*, in the beginning of the night, *Fidicula* (the Harp) appears: it is the ſign of a ſtorm. The xxviii of *April*, the wind is almoſt ſouth, with rain. The xxix of

(22) *Hyades* are five Stars in the *Bull*'s face; ſo called by the *Greeks*, perhaps, becauſe they thought they had great influence to produce rain: by the *Romans* they were called *Suculæ*, from a wrong interpretation of their *Greek* name, as has been already ſaid.

(23) *Radix lanaria*. It is highly probable, that the plant, the juice of whoſe root our author recommends for whitening wool, is what is called *ſaponaria*, ſoapwort. *Pliny* ſays, that it is wonderful how effectual the juice of this root is for waſhing and whitening wool, and making it ſoft, which is the reaſon why it is called *radix lanaria*.

(24) *Libra*, the Balance, or the Scales; one of the 12 Signs of the Zodiac, the ſeventh in order, exactly oppoſite to *Aries*; it is commonly marked thus ♎, which is the beam of the balance. It is probable, that the antients made uſe of this mark to ſhew, that when the Sun enters into this Sign, about the 12th of *September*, he diſtributes day and night equally to all the earth; and this is called the autumnal Equinox.

(25) *Taurus*, the Bull, the ſecond Sign of the Zodiac, marked thus ♉, to repreſent the head and horns of the *Bull*; the Equinoctial Circle divides his knees from the reſt of his body, and with his left horn he is joined with the left foot of *Auriga*: beſides the *Vergiliæ*, already mentioned, it conſiſts of 14 Stars, five of which on his face are, as has been ſaid, called *Hyades*.

(26) *Ver bipartitur*. *Varro*, *lib.* i. *c.* 28. ſays, that the Spring begins about the 12th of *February*, and has ninety-one days; ſo that according to this computation, the twenty-firſt of *April* does not divide the Spring into two equal parts: but it is probable, that *Columella* only means, that, if regard be had to the weather, the half only of the Spring is paſt; but, with reſpect to the number of days, more than the half is paſt: for, according to *Varro*, the Summer begins about the 11th of *May*; but here the author's meaning, to me, ſeems not very plain.

April,

April, *Capra* (the Goat) (27) riſes in the morning: the wind is ſouth the whole day; ſometimes rains. The xxx of *April*, *Canis* (the Dog) (28) hides himſelf in the evening: he ſignifies a tempeſt. During theſe days we will proſecute the things above-mentioned; and olive-trees, if they have now ſlackened their back, may either be ingrafted or inoculated; and other pomiferous trees may be grafted with the ſame kind of emplaſtration or inoculation. It is alſo right to begin to ſhred off the ſuperfluous leaves and twigs for the firſt time, while the buds that are creeping forth by little and little, can be ſtruck off with the finger. Moreover, if the Digger has put any things in the vine-yard out of their due place, or by negligence omitted any things, the diligent Vine-dreſſer ought to reſtore it; and to obſerve and take notice of the broken frames, and repair them, or replace the poles or ſtakes that are thrown down, ſo as he may not pull off the tender buds or leaves. At the ſame time cattle that are fruitful, and have brought forth their young, muſt be marked (29).

The firſt of *May*, during theſe two days the Sun is ſaid to keep in one particle or degree of the Ecliptic. The ii of *May*, one of the *Hyades* riſes with the Sun: northerly winds. The iii of *May*, the whole Conſtellation *Centaurus* (30) (the Centaur) appears: it is the ſign of a tempeſt. The v of *May* the ſame Conſtellation forebodes

(27) *Capra*, a She-goat; a bright fixed Star in the left ſhoulder of *Auriga* (the Waggoner); its longitude 77 degr. 16 min. lat. 22 degr. 50 min. The Poets tell us, that this was the goat which ſuckled *Jupiter* in *Crete*: in recompence, *Jupiter* transformed her into this Star.

(28) *Canis major*, a Conſtellation of Stars, drawn on the globe in figure of this animal; by his hinder-feet he is divided by the tropic of *Capricorn*; with his head he almoſt joins the right foot of *Orion*; he looks with his head to the weſt, but ſtretches his head to the Equinoctial Circle: he ſets when *Sagittarius* riſes, and riſeth with *Cancer*. He has in his mouth that vaſt Star by ſome called *Canicula*, the true name of which ſeems rather to be *Sirius*: this Conſtellation conſiſts of 19 Stars. One would think, that the Conſtellation *Canis minor* ought rather to be called *Caniculâ*.

(29) *Pecudes fœcundi partus*: this is the reading in ſome editions; in others it is *ſecundi partus*: it is uncertain which is the true reading: I have followed the former; if the latter be right, then the meaning probably is, that ſuch cattle as have brought forth a ſecond time, ought to be marked; or perhaps the author means, that ſuch cattle, as were brought forth at the ſecond birth, were the ſtrongeſt and the beſt, and therefore ought to be marked: but the meaning ſeems very uncertain.

(30) *Centaurus*, a Conſtellation of the ſouthern Hemiſphere: he is repreſented as leaning with his feet on the *Antarctic* Circle, and as ſeeming to ſupport with his ſhoulders the Tropic of *Capricorn*, and with his head almoſt joining the tail of *Hydra*: they alſo repreſent him as holding ſome wild beaſt ſupine in his right-hand, which with its feet and ſnout touches the Tropic of *Capricorn*; being placed between him and the *Antarctic* Circle, the *Circulus Lacteus* divides the legs of the Centaur from the reſt of his body. He ſets wholly when *Aquarius* and *Piſces* riſe, and riſeth with *Scorpio* and *Sagittarius*: he conſiſts of 34 Stars. The Mythologiſts tell us, that this is the famous *Chiron*, who taught *Æſculapius* Phyſic, and was Tutor to *Achilles*.

rains.

rain. The vi of *May* the middle of *Scorpio* ſets: it forebodes a ſtorm The vii of *May* the *Pleiades* riſe in the morning: a weſt wind. The ix of *May* Summer begins: a weſt or north-weſt wind; ſometimes rain alſo. The x of *May* all the *Pleiades* appear: a weſterly or north-weſt wind, and ſometimes rains. The xiii of *May Fidis* (the Harp) riſes in the morning, and forebodes a ſtorm. During theſe days the corns muſt be weeded; and they muſt begin to cut down and make the hay. A good Labourer cuts down a *jugerum* of meadow in one day; and one Labourer alſo binds one thouſand and two hundred bottles of hay, weighing four pounds each. It is alſo the time to dig round the trees that have been ablaqueated, and to cover them: one Labourer will be able to dig round eighty young trees in a day, ſixty-five of a middling ſize, and fifty large ones.

This month you muſt dig all your nurſeries frequently: but, from the firſt of *March* to the xiii of *September*, you muſt beſtow a digging every month, not only upon nurſeries, but upon new vineyards alſo. During the ſame days, where the weather is very cold and rainy, olive-trees are pruned and cleared from moſs: but, in warm regions, you do this at two times of the year; the firſt time, from the xv of *October* till the xiii of *December*, and the ſecond time from the xiii of *February* to the xv of *March*; provided nevertheleſs, that the tree does not ſlacken its bark. In this ſame month is the laſt ſeaſon for ſetting an olive-cutting in a paſtinated nurſery; and when you ſet it, you muſt ſmeer it over with dung and aſhes mixed together, and place moſs upon it, leſt it be cloven with the heat of the Sun. But this ſame work will be better done in the latter end of the month of *March*, or in the beginning of the month of *April*; and at other times wherein we directed you to plant nurſeries, either with plants or branches.

The xv of *May Fidis* (the Harp) riſes in the morning: a ſouth or ſouth-eaſt wind; ſometimes it is a moiſt day. The xvi of *May* the ſame as above. The xvii and xviii of *May*, a ſouth-eaſt or ſouth wind with rain. The xix of *May*, the Sun makes his entry into *Gemini* (1) (the Twins). The xxi of *May* the *Hyades* ariſe: northerly winds; ſometimes a ſouth wind with rain. The xxii and xxiii of *May*

(1) *Gemini*, the Twins; one of the 12 Signs of the Zodiac, the third in order, and marked thus ♊. Probably the antients, to repreſent the fraternal affection of *Caſtor* and *Pollux*, put together two logs of wood, and joined them by two croſs pieces. They ſeem to be placed toward the right ſide of *Auriga*, above *Orion*; their heads are divided from the reſt of their body by the Tropic of *Cancer*: they ſet upright upon their feet, and riſe inclined, as if they were lying: this Conſtellation conſiſts of 18 Stars.

Arcturus

Arcturus ſets in the morning: it ſignifies a ſtorm. The xxv, xxvi, and xxvii of *May*, *Capra* (the Goat) riſes in the morning: northerly winds. From the xv of *May* to the firſt of *June*, you muſt dig your old vineyard a ſecond time, before it begins to bloſſom, and, at the ſame time, ſhred off all the ſuperfluous buds and leaves from the ſame, and all the reſt of your vineyards; which if you do frequently, a boy, with one day's labour, will pampinate a *jugerum* of vineyard. In ſome countries they now ſhear their ſheep, and take an account of what young cattle they have bred, and what are loſt. Alſo he who ſows lupins, in order to dung the land therewith, now at length turns them up with the plough.

On the firſt and ſecond of *June Aquila* riſes: a ſtorm of wind, and ſometimes rain. The vii of *June Arcturus* ſets: a weſt or north-weſt wind. The x of *June Delphinus* riſes in the evening: a weſt wind; ſometimes there falls a dew. In theſe days, if we have been overcome by our work, the ſame things muſt be done, which ought to have been done in the latter end of the month of *May*: alſo all fruit-bearing trees, having been digged round, ought to have new earth laid to, and heaped up about their roots, that that work may be finiſhed before the Solſtice. Moreover, according to the ſtate and condition of the country and climate, the earth is either cut up for the firſt time, or twifallowed; and, if it be difficult to labour, a *jugerum* of it is cut up, for the firſt time, by one Labourer in three days, twifallowed in two, and fallowed a third time in one day; but one Labourer will roll and break the clods of two *jugera* in one day. But, if the ground be eaſy to labour, a *jugerum* is tilled by one Labourer in two days, twifallowed in one; and four *jugera* harrowed, and furrows drawn in them, with one day's labour; from which reckoning we infer, that during the Autumn, one hundred and fifty *modii* of wheat may be eaſily ſown by one yoke of oxen, and one hundred *modii* of any kind of pulſe.

In theſe ſame days the threſhing-floor muſt be prepared, that every thing, as it ſhall be cut down, may be brought into it. The culture alſo of vineyards, which are of a greater extent, ought to be performed a ſecond time. Before the Solſtice, fodder (if you have any ſtore of it) muſt be given to the cattle either now, or even the fifteen days preceding the firſt of *June*: but, from the firſt of *June*, if green graſs is now wanting, till the latter end of Autumn, we muſt cut down boughs and leaves of trees, and give them. On the xiii of *June* the heat begins. The xix of *June* the Sun makes his entry into *Cancer*: it forebodes a ſtorm. The xxi of *June Serpentarius*,

which by the *Greeks* is called ὀφιοῦχος (2), ſets in the morning: he ſignifies a ſtorm. On the xxiv, xxv, and xxvi is the *Solſtice* (3): a weſt wind, and heat. In theſe days the ſame things muſt be done, as I directed above: but you muſt cut down vetches for fodder before the pods are hardened; reap barley, pull up lateward beans, threſh early-ripe beans, and lay up their chaff carefully; threſh barley, and lay up all its ſtraw and chaff; caſtrate the bee-hives, which you ought from time to time to view, and cure every ninth or tenth day, to the firſt of *May*. But now, if the honey-combs are full, and have covers or lids upon them, they muſt be cut down: but if they are, for the moſt part, empty, and open, without lids or covers, it is a ſign, that they are not yet ripe; therefore the gathering and making of the honey muſt be deferred. In the provinces beyond ſea, ſome ſow their ſeſam-ſeeds either in this or the following month.

The firſt of *July*, a weſt or a ſouth-weſt wind, and heat. The iv of *July Corona* (4) (the Crown) ſets in the morning. The vi of *July* the middle of *Cancer* (the Crab) ſets: a great heat. The viii of *July* the middle of *Capricornus* ſets. The ix of *July Cepheus* (5) ſets

(2) *Anguifer* or *Ophiuchus*, commonly called *Serpentarius*; a Conſtellation of the northern Hemiſphere: he is repreſented as leaning backward with his head, and holding a ſerpent in his hands, and the greateſt part of which he ſupports with his left arm: his ſhoulders are divided from the reſt of his body by the Tropic of *Cancer*; and towards his knees he is terminated by the Equinoctial: with his left he treads upon the eyes of the *Scorpion*, and with his right he leans upon his back; and the ſerpent, which is held by him, with the extremity of its mouth almoſt touches the *Crown*, and twiſts itſelf round his middle, and with the extremity of its tail joins the Equinoctial line with the tail of the *Eagle*: when he riſes, he appears with *Scorpio* and *Sagittarius*, and ſets when *Gemini*, *Cancer*, and *Leo* ariſe. The Poets tell us, that this is *Æſculapius* the ſon of *Apollo*, who, being by *Jupiter* ſtruck with a thunder-bolt, becauſe, by his skill in Phyſic, he had raiſed the dead to life, was afterwards, at the requeſt of *Apollo*, tranſlated into the heavens. This Conſtellation conſiſts altogether of between 30 and 40 Stars.

(3) *Columella*, as has been ſaid, places the Sun's entry into the ſeveral ſigns later by ſeveral days than it really happens; and here he reckons the Summer-ſolſtice to be about the 24th of *June*, according to the antient computation then in uſe among Husbandmen; but, according to the corrections made in the Calendar, the Summer-ſolſtice falls about the 11th of *June*.

(4) *Corona borealis*, the northern Crown; a Conſtellation, conſiſting of about 20 Stars: nine of them are placed circularly, ſo as to repreſent a Crown. *Bootes* ſeems almoſt to touch the *Crown* with his left ſhoulder, and *Engonaſin*, or *Hercules* kneeling, joins it with the heel of his right foot: it ſets when *Cancer* and *Leo* riſe, and riſes with the *Scorpion*. The Poets tell us, that this is the crown of gold and precious ſtones made by *Vulcan*, which *Bacchus* gave to his bride *Ariadne*, daughter of *Minos* King of *Crete*. No doubt the Aſtronomers, who divided the Stars into Conſtellations, took this name out of ſome hiſtory of *Crete*, which gave an account of this marriage.

(5) *Cepheus*, a Conſtellation in the northern Hemiſphere, conſiſting of about 20 Stars: he is placed behind the *Leſſer Bear*: from his feet to his breaſt he is incloſed within the *Arctic* Circle, ſo that nothing of him is ſeen to ſet, except his ſhoulders and his head:

ſets in the evening: he forebodes a ſtorm. The x of *July* the *Harbinger* or *Forerunner* winds (6) begin to blow: in theſe days the ſame things to be done as above. But it is alſo very proper now to twi-fallow ſuch fallow ground, as has been tilled for the firſt time; and, when the Moon is upon the decreaſe, wood-land is grubbed up to very great advantage. The xv of *July Procyon* (the Leſſer Dog) (7) riſes in the morning: he ſignifies a ſtorm. The xx of *July* the Sun paſſes into *Leo:* a weſt wind. [The xxiv of *July* the bright Star in the breaſt of *Leo* riſes]: ſometimes it is the ſign of a ſtorm. The xxv of *July Aquarius* (the Water-bearer) begins to ſet bright and clear: a weſt or ſouth wind. The xxvi of *July* the *Canicule* appears: a ſultry hot fog. The xxvii of *July Aquila* (the Eagle) riſes. The xxix of *July* the bright Stars in the breaſt of *Leo* ariſe: ſometimes this is the ſign of a ſtorm. The xxx of *July Aquila* ſets: it forebodes a ſtorm.

In theſe days the harveſt is finiſhed, in places that are temperate, and lie near the ſea; and, within thirty days after the corns are cut down, the ſtubble is cut down, and gathered together into heaps: one Labourer cuts down a *jugerum* of ſtubble in one day, which being removed before the violent heat of the Sun ſcorches the earth, you muſt dig round all the trees that were in the corn-land, and heap up the earth round them. Alſo they who make preparation for the ſeed-time, in order to ſow a great quantity, ought now to plow their land a ſecond time: for, as to digging and cultivating new vineyards, I have already often ſaid, That no month ought to be omitted, till the autumnal

head: he is not far diſtant from the winding that the *Dragon* ſeems firſt to make with his head: he is repreſented with both his arms projected, and is as far diſtant from the feet of the *Leſſer Bear*, as the ſpace between his own feet ſeems to be: his head ſeems to ſet when the *Scorpion* riſes, and to riſe with *Sagittarius*. This *Cepheus* is ſaid to have been a King of the *Ethiopians*, and father of *Andromeda*, whom *Perſeus* reſcued from the ſea-monſter to which ſhe was expoſed; a ſtory much celebrated by Poets and Painters. From this hiſtory, Aſtronomers have taken names for ſome other Conſtellations contiguous to, or not far diſtant from this; as *Caſſiopea*, *Andromeda*, and *Perſeus*.

(6) *Prodromi flare incipiunt*. *Pliny* ſays, that, about eight days before the riſing of the *Dog-ſtar*, the north-eaſt winds begin to blow; and, becauſe they come before the riſing of this Star, they are called the *Forerunners* or *Harbingers*.

(7) *Procyon*, or *Anticanis*. The Leſſer Dog is ſo called, becauſe he riſes before *Canis major* (the Greater Dog) he with his feet fixed in the *Circulus Lacteus* touches the Equinoctial: he looks to the weſt, as placed between *Gemini* and *Cancer:* he ſets when *Capricorn* riſes, and riſeth with *Leo;* according to *Hyginus*, *de ſignis cœleſtibus*, it is a ſmall Conſtellation, conſiſting of three Stars, and muſt be conſidered as different from that vaſt bright Star in the mouth of *Canis major*, which is commonly called *Canicula*, the Dog-ſtar, and tho' but one ſingle Star, yet takes the name of the whole Conſtellation. *Pliny*, and ſome other authors, ſeem to take *Procyon* and *Canicula* for one and the ſame Star; but our author mentions them as different.

Equinox be paſt. But we muſt remember, that, during theſe days, and the days of the month of *Auguſt*, early in the morning, and in the evening, we cut down boughs and leaves for the cattle; alſo whatever vineyards we deſign to cultivate, that we do not dig them during the great heat, but in the morning, till the third hour of the day, and from the tenth hour till the evening.

In ſome countries, as in *Cilicia* and *Pamphylia*, they ſow ſeſame-ſeeds in this month: but, in the moiſt regions of *Italy*, they may be ſown in the latter end of the month of *June*. It is alſo the time for hanging branches of wild fig-trees (8) upon fig-trees; which ſome think ought to be done for this reaſon, that the fruit may not fall off them, and that it may come the more ſpeedily to maturity.

The firſt of *Auguſt* the *Eteſian winds* blow (9). The iv of *Auguſt* the middle of *Leo* riſes: it forebodes a ſtorm. The vii of *Auguſt* the middle of *Aquarius* ſets: a foggy heat. The xii of *Auguſt Fidis* (the Harp) ſets in the morning, and Autumn begins. In theſe days the ſame things are to be done as above: nevertheleſs, in ſome places they cut down the honey-combs, which if they are not full of honey, nor have lids upon them, the gathering and making of the honey muſt be deferred till the month of *October*. The xiii of *Auguſt* the ſetting of *Delphinus* is the ſignification of a ſtorm. The xiv of *Auguſt*, the ſetting of the ſame Conſtellation in the morning forebodes a ſtorm. The xx of *Auguſt* the Sun paſſes into *Virgo* (10): it forebodes a tempeſt in this and the following day; and ſometimes

(8) *Pliny*, *lib.* xv. *c.* 19. tells us, that they uſed to haſten the ripening of figs, by taking branches of the wild fig-tree, which itſelf never produces fruit, and hanging them amongſt the fig-trees; and that theſe branches did produce a certain ſort of flies, which, when the branches began to rot, being deprived of their natural nouriſhment, left them, and flew to the fig-trees, and fed greedily upon the figs, and, with their bite opening the tops of the figs, gave free entrance to the Sun, and the ripening breezes; and ſucked out the acid milky juice of the young figs, and thereby haſtened their ripening. *Palladius*, ſpeaking of the ſame thing, adviſes to take wild figs, and, putting a flaxen rope through them, hang them up among the fig-trees: this the *Romans* called *caprificatio*.

(9) *Eteſiæ*, anniverſary winds, formed from the *Greek* word ἔτος, which ſignifies a *year*: they are north-eaſt winds, which blow yearly about this time in Summer.

(10) *Virgo*, one of the 12 Signs of the Zodiac, the ſixth in order; it is marked thus ♍. In ſome old books ſhe is repreſented as holding three ears of corn in her left-hand, for which reaſon ſhe is ſuppoſed to repreſent *Ceres*; but *Aratus* and others ſay, that this Sign repreſents *Juſtice*, which, abhorring the wickedneſs of mankind, forſook the earth, and retired to heaven. She is placed below the feet of *Bootes*: with her head ſhe touches the hinder-part of *Leo*, and with her right-hand the Tropic of *Cancer*; the lower part of her body is ſeen above the *Raven*, and the tail of *Hydra*: ſhe ſets with her head before the reſt of her members. This Conſtellation conſiſts of 16 or 18 Stars, one of which in her right-wing, fixed to her ſhoulder, is called *Vindemiator*, the Vintager, and by the *Greeks* called *Protrygeter*; probably becauſe it riſeth before the vintage, as has been already ſaid.

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it thunders. This ſame day *Fidis* (the Harp) ſets. The xxiii of *Auguſt*, from the ſame Conſtellation, for the moſt part, a ſtorm ariſeth, and rain. The xxvi of *Auguſt Vindemiator* (the Vintager) riſes in the morning, and *Arcturus* begins to ſet: it is ſometimes rain. The xxx of *Auguſt* the ſhoulders of *Virgo* appear: the *Eteſian* winds ceaſe to blow, and ſometimes it is Winter-weather. The xxxi of *Auguſt Andromeda* (11) riſes in the evening: ſometimes it is very cold, as in Winter.

And in theſe days fig-trees are inoculated, which kind of ingrafting is called *Emplaſtration* (12): and this, indeed, may be done more conveniently in the preceding month, after the xv of *July*, in which time ſome inoculate other trees alſo. In ſome places the vintage is finiſhed, as in *Bætica*, in the regions that lie upon the ſea-coaſt, and in *Africa:* but in colder regions they make their *Pulverization* (13), which Ruſtics call *Harrowing*, when every glebe in the vineyards is broken, and reduced into powder. At this ſame time, before the vineyards are pulverized, if the vines themſelves are very ſmall or thin, three or four *modii* of lupins are ſcattered upon each *jugerum*, and harrowed in; which being turned up with the firſt digging, after they have ſprung up into ſtalks, afford dung good enough for vineyards.

Many alſo, if the conſtitution of the climate be rainy, as in that region of *Italy* which lies contiguous to the city, ſtrip the vine of its young ſhoots and leaves, that the fruit may be throughly concocted and ripened, and not rot with the ſhowers. But on the contrary, in warmer places, as in the provinces juſt now named, about the time of the vintage, the grapes are overſhadowed either with ſtraw, or other coverings, that they may not wither, and be dried up by the winds or heats. This ſame time is alſo proper for making dry grapes and figs, of which, after what manner they may be dried in the Sun, we ſhall afterwards give an account, when we ſhall treat of the offices of

(11) *Andromeda*, a northern Conſtellation, conſiſting of 20, or, as others ſay, of 27 Stars: ſhe is repreſented as placed near *Caſſiepea*, above the head of *Perſeus*, there being a ſmall diſtance between them: her head is joined to the belly of the Horſe *Pegaſus*, the ſame Star being called the *navel of Pegaſus*, and the *head of Andromeda*; the Tropic of *Cancer* paſſes through and divides her breaſt, and her left-hand by the middle: ſhe riſes with the ſigns *Piſcis* and *Aries*.

(12) *Emplaſtratio:* of this way of ingrafting amongſt the antients, you have an account *lib.* v. *c.* 11.

(13) *Pulveratio. Pliny, Theophraſtus*, and others, recommend the pulverizing of vines, in order to plump and ripen the fruit: it is digging the vineyards when the ground is very dry, breaking the clods, and raiſing the duſt. *Vide lib.* iv. 28. and *Palladius, Jun.* 7. 2.

the Bailiff's wife. It is right alſo to extirpate fern or ſedge in the month of *Auguſt*, where-ever they grow: nevertheleſs, it is better to do it about the xv of *July*, before the riſing of the *Dog-ſtar*. The firſt of *September*, hot weather. The ii of *September*, the ſouthern *Piſcis* ceaſes to ſet: hot weather. The v of *September Arcturus* riſes: a weſt or north-weſt wind. The vii of *September* the northern *Piſcis* ceaſes to ſet, and *Capra* riſes: it is the ſign of a ſtorm. The xi of *September* a weſt or ſouth wind; the middle of *Virgo* riſeth. In theſe days, in places that lie upon the ſea-coaſt, and are warm, it is a convenient time for carrying on the vintage, and managing the other things above-mentioned. Alſo twifallowing the plowed land ought then to be finiſhed, if the ground has been tilled, for the firſt time, ſomewhat too late; but, if it has been tilled ſooner than uſual, it is proper alſo, that the ground be plowed a third time. At this time alſo they, who are accuſtomed to preſerve wines, prepare ſea-water, and, after they have brought it home boil it: concerning the preparing of which I ſhall give directions, when I come to treat of the offices of a Bailiff's wife. The xiii of *September* ſometimes ſignifies a tempeſt, from the Conſtellation they call the *Whale* (14). The xvii of *September Arcturus* riſes: a weſt or ſouth wind; ſometimes an eaſt wind, which ſome call *Vulturnus*. The xviii of *September Spica Virginis* (the ear of corn in the left-hand of *Virgo*) riſes: a weſt or north-weſt wind. The xix of *September* the Sun paſſes into *Libra*; *Crater* (the Cup) appears in the morning. The xxi of *September Piſces* (the Fiſhes) ſet in the morning; alſo *Aries* (the Ram) begins to ſet: a weſt or north-weſt wind; ſometimes a ſouth wind with ſhowers. The xxii of *September* the ſhip *Argo* ſets: it forebodes a ſtorm, ſometimes rain alſo. The xxiii of *September Centaurus* (the Centaur) begins to riſe in the morning: it forebodes a ſtorm, and ſometimes rain. The xxiv, xxv, and xxvi of *September*, the autumnal equinox forebodes rain. The xxvii of *September Hædi* (the Kids) ariſe (15): a weſt wind, ſometimes a ſouth wind, with rain. The xxviii of *September Virgo* ceaſes to riſe: it forebodes a ſtorm.

In theſe days they gather their grapes, and make their vintage, in many countries. Some take the indication of their being ripe from

(14) *Cetus*, the Whale; otherwiſe called *Priſtes*, or *Priſtinum ſidus*; a Conſtellation in the ſouthern hemiſphere, conſiſting of 13, or, as others ſay, of 23 Stars. The Tropic of *Capricorn* divides its tail by the middle; with its ſnout it almoſt joins the hinder foot of *Aries*; the river *Eridanus* almoſt waſhes the fore-part of its body: it ſets when *Cancer* and *Leo* riſe, and riſes with the *Centaur* and the *Twins*.

(15) *Hædi*, the Kids, are two Stars in the left-arm of *Auriga*, the Waggoner, which is a Conſtellation in the northern hemiſphere, under the feet of *Perſeus*.

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one thing, ſome from another. Some, when they had ſeen ſome part of the grape grow mellow, have believed, that the time of vintage was come, and that the grapes were ripe for gathering: ſome, after they have obſerved them to be diſcoloured and tranſparent: ſome alſo, when they had obſerved the ſmall twigs and leaves to fall off: all which things are fallacious; becauſe all theſe ſame things may happen to unripe grapes, by reaſon of the exceſſive heat of the Sun, or intemperateneſs of the year. Therefore ſome have attempted to find out when they are ripe by their taſte, that whether the taſte of the grape was ſweet or ſour, they might judge accordingly. But even this thing itſelf has ſome fallacy: for ſome kinds of grapes, becauſe of their too great roughneſs, never contract any ſweetneſs. Therefore it is proper (which we do) to conſider the natural maturity itſelf: and this is the natural maturity, if the kernels or grape-ſtones, which are hid in the grapes, when you have ſqueezed them out of them, are of a duſky colour, and ſome of them almoſt black: for nothing whatſoever can give a colour to the kernels or grape-ſtones, except the natural ripeneſs; eſpecially conſidering, that they are ſo placed in the middle part of the grapes, that they are protected both from the violent heat of the Sun, and from the winds; and the moiſture itſelf does not ſuffer them to be throughly ripened, or reduced to a duſky colour, except by their own very nature itſelf: therefore, when the Bailiff ſhall be ſure of this, let him know, that he muſt begin his vintage, and gather his grapes.

But, before he begins to gather the fruit, all things muſt be prepared (if it can be done) in the preceding month; if not, that, at leaſt fifteen days before, the hogſhead be partly pitched, partly rubbed, and carefully waſhed with ſea-water, or ſalted water, and rightly dried; as alſo the covers and ſtrainers, and the other things, without which the muſt cannot be well managed; and that the wine-preſſes and tubs be carefully cleaned, and waſhed, and pitched, if the matter ſo require: and let him have wood prepared, wherewith he may boil the muſt, either into a third or an half of the firſt quantity, for making rob of grapes. As alſo ſalt, and perfumes, and ſweet ſpices, with which they uſe to give a reliſh to, and preſerve wines, muſt be laid up in ſtore a good while before.

Nevertheleſs, let not this care call him wholly off from the other parts of Huſbandry: for, during theſe days, both navew- and turnep-beds are made in places that are naturally dry. Miſcellany alſo, which will be a great ſupport to cattle during Winter, and alſo that huſk or pod which Ruſtics call fenugreek, as alſo tares for fodder, are now

ſown,

ſown, and not till now. This alſo ſhall be the principal time for ſowing of lupines, which, ſome people think, muſt be forthwith carried directly from the threſhing-field into the land. At this time millet and panic are cut down, when the kidney-bean is ſown for food: for, in order to gather ſeed of it, it is better to put it underground the latter end of *October*, about the firſt of *November*. Wherefore, ſeeing he ought to tranſact and execute all theſe things in the fields, he may delegate the care of thoſe things, which muſt be done within the Manor-houſe, to his wife the Houſekeeper; yet ſo, that he himſelf may examine and conſider whether they are rightly done, or not.

The firſt and ſecond of *October* ſometimes forebodes a ſtorm. The iv of *October*, *Auriga* (the Waggoner) ſets in the morning: *Virgo* leaves off ſetting; ſometimes it is the ſign of a ſtorm. The v of *October Corona* (the Crown) begins to riſe: it forebodes a ſtorm. The vi of *October Hædi* (the Kids) riſe in the evening; the middle of *Aries* ſets: a north-eaſt wind. The viii of *October*, the bright Star of *Corona* (the Crown) riſes. The x of *October*, the *Pleiades* riſe in the evening: a weſt wind, and ſometimes a ſouth-weſt wind, with rain. The xiii and xiv of *October*, the whole Conſtellation *Corona* riſes in the morning: a winterly ſouth wind, and ſometimes rain. During theſe days they uſually gather their grapes, and make their vintage, in cold countries, and do the other things which are above-written: and in the ſame regions they ſow their early-ripe corns, and eſpecially red-bearded *huſked wheat*. Alſo, in places not expoſed to the Sun, it is now the right time to ſow the beſt common wheat.

And, ſince we have made mention of the ſeed-time, it will not be unſeaſonable, that we give an account, how much ſeed of every ſort a *jugerum* of land may receive. A *jugerum* of land receives four or five *modii* of common wheat, nine or ten *modii* of red-bearded huſked wheat, five or ſix *modii* of barley, four or five *ſextarii* of millet or panic, eight or ten *modii* of lupines, four *modii* of kidney-beans, three or four *modii* of peaſe, ſix *modii* of beans, one *modius*, or a little more, of lentils, nine or ten *modii* of linſeed, three or four *modii* of chichlings, two or three *modii* of chich-peaſe, four or five *ſextarii* of ſeſame-ſeed, ſeven or eight *modii* of vetches for fodder, and five or ſix *modii* of vetches for ſeed, four or five *modii* of better vetches, ſeven or eight *modii* of barley miſcellany, ſix *modii* of fenugreek-ſeed; in beds ten feet long, and five feet broad, you muſt ſow a *cyathus* of medic, or *St. Foin-ſeed* each: ſix grains of hempſeed are ſet in a ſquare foot of ground.

On the xv of *October*, and the two following days, there is ſometimes a ſtorm; ſometimes there falls a dew. The xx of *October* the Sun paſſes into *Scorpio* (16). The xx and xxi of *October*, at the riſing of the Sun the *Pleiades* begin to ſet: it is the ſign of a ſtorm. The xxii of *October* the tail of *Taurus* ſets: a ſouth wind, ſometimes rain. The xxv of *October Centaurus* ceaſes to riſe in the morning: it forebodes a ſtorm. The xxvi of *October* the forehead of *Scorpio* riſes: it is the ſign of a ſtorm. The xxviii of *October* the *Pleiades* ſet: it is ſtormy weather, with cold and froſts. The xxix of *October Arcturus* ſets in the evening: a windy day. The xxx and xxxi of *October Caſſiope* (17) begins to ſet: it ſignifies a ſtorm.

During theſe days it is a right time to ſet whatever plants ought to be tranſplanted, and ſet at a diſtance from one another, and ſmall trees of all ſorts. It is alſo a proper time to match elms with vines, and to propagate the vines themſelves by layers, in places where they are ſupported by trees, and in vineyards. It is the time to weed and dig nurſeries, as alſo to ablaqueate trees, and vineyards alſo, and to prune the ſame; as alſo to prune ſuch vines as are ſupported by trees. Nurſeries which have not been pampinated in their due time, and ſmall fig-trees, which grow in nurſeries, ought to be pruned, and reduced to ſingle ſtems; which nevertheleſs, while they are young and tender, are better pampinated while they are putting forth their buds. But, as all things in Huſbandry muſt be done ſpeedily, and with reſolution, ſo eſpecially ſowing of ſeed, and planting. It is an antient proverb among Huſbandmen, *That early ſowing and planting uſe often to deceive us, but that that which is late never deceives us, as to its being certainly bad.* Therefore we direct, upon the whole, that, according as every place ſhall be naturally cold, let that be firſt ſown or planted: and in proportion as every place ſhall be warm, let it be laſt.

(16) *Scorpio*, the Scorpion, is the eighth Sign of the Zodiac, and is commonly marked thus ♏. By the antients the Scorpion was drawn larger than at preſent, ſo that the claws of it took up that part of the heavens which is now aſſigned to *Libra*: it is placed under the feet of *Serpentarius*, and ſeems to touch the Tropic of *Capricorn* with the point of its tail, and is not far from the animal which the *Centaur* is repreſented as holding in his hand. This Conſtellation conſiſts of 19 Stars.

(17) *Caſſiope*, or *Caſſiepea*, as the Mythologiſts tell us, was wife of *Cepheus* a King of the *Ethiopians*: ſhe by her pride, in preferring her own and her daughter *Andromeda*'s beauty to that of the *Nereides*, was the cauſe of her daughter's being expoſed to be devoured by a whale, but was reſcued by *Perſeus*. She alſo, as her husband and daughter, gives name to a northern Conſtellation, and is repreſented as ſitting in a chair next to *Cepheus*, with her feet placed in the *Arctic* circle, and her body reaching to the Tropic of *Cancer*, which ſhe touches with her head and her right-hand, and the *Circulus Lacteus* divides her almoſt in the middle.

Tares

Tares and beans are ſaid to dung land: unleſs you turn up lupines in the bloſſom, you will not thereby contribute any thing towards dunging the land: for there is nothing whatſoever that is more commonly either ſown or gathered in, when the Labourers have nothing to do; for, in the very beginning of the ſeed-time, it may be put under-ground before any other ſeed, and it may be taken off the ground very late in the year, after all the fruits are gathered in. After you have ſown your ſeed, you muſt harrow in what you have ſown. Three Labourers will with eaſe, in three days, harrow two *jugera*, and ablaqueate the trees that ſhall be upon the ground: although the antients would have every Labourer ſarcle and harrow a *jugerum* a day each; which, whether it can be done rightly or not, I dare not affirm.

At the ſame time it is proper to cleanſe the ditches and rivulets, and make gutters for drains, and water-furrows: at the ſame times it will be proper that we give the oxen aſh-leaves, if we have them; if not, wild aſh-leaves; if we have not theſe neither, evergreen-oak-leaves. It will not be amiſs alſo, to give to each yoke of oxen one *modius* of maſt; nevertheleſs you muſt not give them more, leſt they be ſick with it; nor for leſs time than thirty days: for if you give it them for fewer days (as *Hyginus* ſays) the oxen become ſcabby in the Spring; but the maſt muſt be mixed with chaff, and ſo laid before the oxen. Alſo, if any man has a mind to make a wilderneſs, where all ſorts of trees grow together wild without order, then is the proper time to plant them with maſt, and other ſeeds or plants. Then alſo the olive-tree muſt be ſtript of its berries, of which you have a mind to make green oil, the beſt of which is made of the olive-berry which is ſpeckled, when it begins to grow black: for bitter oil ought not to be made but of the white olive-berry.

The firſt of *November*, and the day after, the head of *Taurus* ſets: it is a ſign of rain. The iii of *November Fidicula* (the biggeſt Star in the *Harp*) riſes in the morning: it is cold ſtormy weather, and rains. The vi of *November* this ſame whole Conſtellation riſes: a ſouth or weſt wind: it is cold ſtormy weather. The vii of *November* the bright Star of *Scorpio* riſes: it is the ſign of a ſtorm: it is cold Winter-weather, or a north-eaſt wind; ſometimes there is a dew. The viii of *November* the *Pleiades* ſet in the morning: it forebodes a ſtorm: it is cold Winter-weather. The ix of *November* the Winter begins: a ſouth or eaſt wind; ſometimes there falls a dew. In theſe days, till the xiiith, you may yet do tolerably well ſuch things as you could not do the preceding month: but you muſt obſerve this particularly, that

that the day before it is full Moon, if not then, yet without fail upon the very day of the full Moon, you ſow, in one day, all the beans you deſign to ſow: but afterwards you may cover them with earth, to defend them from the fowls and the cattle; and, if the courſe of the Moon ſhall ſo fall out, take care to have them harrowed, in the fatteſt and new ground, before the xiii of *November*; but, if you have not ſuch kind of ground, let it be in ground exceeding well dunged. It will be ſufficient to provide eighteen loads of dung for each *jugerum*; but a load of dung contains eighty *modii:* from which you may infer, that you muſt ſcatter five *modii* of dung upon ten feet ſquare; which computation teaches us, that MCCCCXL *modii* are ſufficient for the whole *jugerum.* Then it is alſo proper to ablaqueate olive-trees, and if they bear but little fruit, or if, upon their tops, their twigs and leaves are ſhrivelled and withered, to ſcatter four *modii* of goats-dung round the great trees, and to obſerve a proportion in the reſt, according to their bigneſs: at the ſame time, in ſuch vineyards as are ablaqueated, to pour about one *ſextarius* of pigeon's dung, or a *congius* of human urine, or four *ſextarii* of other dung about each vine. Two Labourers will, in one day, ablaqueate a *jugerum* of vineyards, where the vines are placed at the diſtance of ſix feet.

The xiii of *November* an uncertain day; nevertheleſs it is oftenеſt calm and mild. The xv of *November* a north wind, ſometimes a ſouth wind with rain. The xvi of *November Fidis* (the Harp) riſes in the morning: a ſouth wind, ſometimes a great north-eaſt wind. The xvii of *November* a ſouth-eaſt wind, ſometimes a ſouth wind with rain. The xviii of *November* the Sun paſſes into *Sagittarius.* The *Hyades* riſe in the morning: it forebodes a tempeſt. The xx of *November* the horns of *Taurus* ſet in the evening: a cold north-eaſt wind and rain. The xxi of *November* one of the *Hyades* ſets in the morning: it is ſtormy Winter-weather. The xxii of *November Lepus* (the Hare) (18) ſets in the morning: it forebodes a ſtorm. The xxv of *November Canicula* (the Dog-ſtar) ſets at the riſing of the Sun: it is cold Winter-weather. The xxx of *November* all the *Hyades* ſet: a weſt or ſouth wind, ſometimes rain.

In theſe days you muſt finiſh ſuch works as were omitted the preceding days; and if we do not ſow very much, it will be beſt to have finiſhed our ſowing before the firſt of *December.* But alſo, when

(18) *Lepus*, the Hare, a ſmall ſouthern Conſtellation, conſiſting, as ſome ſay, of ſix, and as others, of 13 Stars. It is placed under the feet of *Orion*, and has *Sirius* behind, as if he were always in purſuit of it; the Tropic of *Capricorn* divides the lower part of its body: it riſeth with *Leo*, and ſets when *Sagittarius* riſeth.

the nights are long, ſome part of the night muſt be added to the day-time: for there are many things which are very well done by candle-light. For, if either we poſſeſs vineyards, the ſtakes and poles, or props round and ſquare, may be hewed ſmooth, and ſharpened; or if the country be fertile of fennel-giant or bark, hives ought to be made for bees; or if it be fruitful in palm-trees, or *Spaniſh* broom, baſkets, frails, and panniers, ought to be made; or if it abounds in young ſprigs, then hampers and oſier baſkets. But not to mention all other things at preſent, there is no region which does not afford ſomething which may be done by candle-light: for it is the character of a ſlothful Huſbandman, to delay beginning his work till it be day-light, when the days are ſhort, eſpecially in thoſe regions where the ſhorteſt days are of nine hours, and the nights of fifteen. Willows alſo, which have been cut down the day before, may be cleaned by candle-light, and prepared for bindings for the vines, which, if they be naturally not very tough, muſt be cut down fifteen days before, and, after they are cleaned, covered with dung, that they may become tough and pliant: but if they have been cut down a great while ago, and are grown dry, they muſt be ſteeped in a pond. You muſt alſo ſharpen the iron-tools by candle-light, and make handles for them, or fit to them ſuch as are already made, of which thoſe of evergreen oak are the beſt, then thoſe of hornbeam, and after theſe thoſe made of aſh.

The firſt of *December* an uncertain day; nevertheleſs it is oftener calm and mild. The vi of *December* one half of *Sagittarius* (the Archer) ſets: it forebodes a ſtorm. The vii of *December Aquila* (the Eagle (19) riſes in the morning: a ſouth-weſt wind, ſometimes a ſouth wind; there falls a dew. The xi of *December* a north-weſt or north wind; ſometimes a ſouth wind with rain. In theſe days, ſuch works as have been omitted the former month, muſt be throughly done, *viz.* in temperate, or in hot places; for in ſuch places as are cold they cannot now be rightly done. The xiii of *December* the whole Conſtellation of *Scorpio* riſes in the morning: it is cold Winter-weather. The xvii of *December* the Sun paſſes into *Capri-*

(19) *Aquila*, the Eagle, a Conſtellation in the northern Hemiſphere, conſiſting, according to ſome writers, of 32 Stars; but the antient Aſtronomers make their number much ſmaller: with its right wing it is not much diſtant from the Equinoctial Circle, and with its left wing it is repreſented as not far from the head of *Serpentarius*: a circle, which is ſuppoſed to paſs from *Cancer* to *Capricorn*, divides its bill from the reſt of its body: it ſets when *Leo* riſes, and riſeth with *Capricorn*.

corn:

corn (20): it is the Winter-ſolſtice, as *Hipparchus* will have it; therefore it often is the ſign of a ſtorm. The xviii of *December* forebodes a change of the winds. The xxiii of *December Capra* (the Goat) ſets in the morning: it is the ſign of a ſtorm. The xxiv of *December* is the Winter-ſolſtice (as the *Chaldeans* obſerve). The xxvii of *December Delphinus* (the Dolphin) begins to riſe in the morning: it is the ſign of a ſtorm. The xxix of *December Aquila* (the Eagle) ſets in the evening: it is cold Winter-weather. The xxx of *December Canicula* (the Dog-ſtar) ſets in the evening: it is the ſign of a ſtorm. The xxxi of *December* a ſtorm of wind.

They who practiſe Huſbandry with more ſcrupulous exactneſs and ſuperſtition than ordinary, deny that the earth ought to be moved, in theſe days, with any iron-tool, except you trench it on account of a vineyard. Therefore whatever may be done beſides that kind of work, is by them comprehended in ſuch things as thoſe; *viz.* that olive-berries may be gathered, and oil made; that a vine may be ſtaked, and faſtened to the ſtake as far as its head; that frames may be placed in vineyards, and the ſtocks of the vines faſtened to them as high as their heads: but it is not expedient, at this time, to bind the branches of the vine to the frame, for very many of them would break, becauſe of their ſtiffneſs, occaſioned by the cold. Alſo, in theſe days cherry-trees and *tuberes*, apricock- and almond-trees, and ſuch other trees as bloſſom firſt, may be commodiouſly grafted. Some alſo ſow pulſe.

The firſt of *January* an uncertain day. The iii of *January Cancer* (the Crab) ſets: changeable weather. The iv of *January* is the middle of Winter: much wind from the ſouth; ſometimes rain. The v of *January Fidis* (the Harp) riſes in the morning: variable weather. The viii of *January* a ſouth wind, ſometimes a weſt wind. The ix of *January* a ſouth wind, ſometimes a ſhower. The xii of *January* the ſtate of the weather is uncertain. During theſe days alſo the more ſcrupulous and ſuperſtitious Huſbandmen abſtain from all manner of working whatſoever in the ground; ſo nevertheleſs that, for the ſake of good luck, they begin every kind of work upon the very

(20) *Capricornus*, the 10th Sign of the Zodiac, marked commonly with this character ♑. When the Sun enters into this Sign, about the 11th of *December*, he is come to his utmoſt ſouthern declination, and makes the ſhorteſt day to them who live in the northern Hemiſphere, which is called the *Winter-ſolſtice*, he proceeding no further ſouth, but returns again towards the Equinoctial. He is repreſented as looking towards the weſt, and is divided by the middle by the Tropic of *Capricorn*, and is placed under the left-hand of *Aquarius*. They reckon 21 Stars in this Conſtellation.

firſt day of *January*: but they defer the moving and labouring of the earth till the enſuing xiiith day of the month.

But neither ought the Bailiff to be ignorant, of what is ſufficient to be given to one yoke of oxen every day throughout every month: wherefore we ſhall ſubjoin an account of this care alſo. In the month of *January* he ſhall give them ſtraw and chaff with ſix *ſextarii* of ſteeped bitter vetches, or ſtraw and chaff with half a *modius* of bruiſed chichlings, or a fodder-baſket full of leaves of twenty *modii*, or as much ſtraw and chaff as they will eat, and twenty pound weight of hay, or green leaves from off the evergreen oak or laurel in abundance; or, which is better than all theſe, dry barley miſcellany. In the month of *February* the ſame. In *March* the ſame; or, if they are going to do their work, fifty pound weight of hay. In *April* he ſhall give them common oak- and poplar-leaves from the firſt to the thirteenth, or chaff and ſtraw, or forty pound weight of hay. In *May* he ſhall give them fodder in abundance. From the firſt of *June* leaves in abundance. In *July* the ſame. *Auguſt* the ſame; or fifty pound weight of ſtraw or chaff out of the field. In *September* leaves and boughs in abundance. In *October* green boughs with leaves, and fig-tree-leaves. In *November*, till the thirteenth day of the month, green boughs with leaves, or fig-tree leaves, as many as one forage-baſket will contain; and from the thirteenth one *modius* of maſt mixed with ſtraw or chaff, and one *modius* of ſteeped lupines mixed with ſtraw or chaff, or ripe miſcellany. In the month of *December* he ſhall give them dry leaves, or ſtraw and chaff, with half a *modius* of bitter vetches ſteeped in water, or lupines, as many as half a *modius* of them ſteeped may amount to; or one *modius* of maſt, as is above-written, or meſcelin.

CHAP. III.

Of the Culture of Gardens, and of Garden-herbs, in Proſe.

FOraſmuch as we have given a particular account of the works incumbent upon the Bailiff to perform throughout the whole year, each in its proper ſeaſon; being mindful of our promiſe, we ſhall ſubjoin the culture of gardens, of which he is equally obliged to undertake the care, both that he may leſſen the expences of his daily maintenance; and that, when his Maſter comes to him, he may, as the

the Poet ſays, ſet before him *the country's unbought viands* (1). *Democritus*, in that book which he called *Georgicon*, is of opinion, that they do not act very prudently, who build ſtrong fences round their gardens, becauſe neither can a wall made of brick laſt many years, it being, for the moſt part, damaged by rains and ſtorms; nor does the expence, beyond the dignity and worth of the thing, require ſtones. But, if any perſon would incloſe a large extent of ground, it is neceſſary, that he have a good eſtate: therefore I myſelf will ſhew you a method, whereby, with no great pains, we ſecure our garden from the incurſion both of men and of cattle.

The moſt antient authors preferred a quickſet hedge to a built wall, becauſe it would not only require leſs expences, but laſt a vaſt time longer; therefore they have given us this following method of making of hedges, by planting of thorns. The place which you deſign to incloſe with an hedge, muſt, as ſoon as the earth ſhall be moiſtened with ſhowers, after the autumnal Equinox, be ſurrounded with two furrows diſtant, about the ſpace of three feet the one from the other. It is ſufficient, that the meaſure of their depth and breadth be two feet: but we muſt ſuffer them to lie open without filling them up throughout the whole Winter, having prepared the ſeeds to ſow them withal: and let them be thoſe of the largeſt thorns, and eſpecially of bramble, and of white thorn, and of that which the *Greeks* call κυνόσβαλον· we call it *dog's thorn*: but the ſeeds of theſe thorns muſt be choſen as ripe as poſſible; and you muſt mix them with the meal of bitter vetches, well ground, which, when ſprinkled with water, you muſt daub upon old ſhip-ropes, or any other ſorts of ropes whatſoever; then the ſmall ropes, being dried, are laid up in a loft. Afterwards, when the Winter-ſolſtice is paſt, having intermitted forty days, about the time that the ſwallow comes; now, when the weſt wind begins to riſe, after the thirteenth of *February*, if any water has ſtood in the furrows during the Winter, you draw it out; and, having looſened the ground which was thrown out of the furrows in Autumn, you replace it again as far as the half of the depth of the furrows: afterwards the aforeſaid ropes are taken out of the loft, and uncoiled; and, being ſtretched to their full length, are laid along both the furrows, and covered with earth, but ſo, that there not being too much earth thrown upon them, the ſeeds of the thorns, which ſtick in the twiſts of the ropes, may be able to ſpring up. They creep forth about the thirtieth day; and, after they are advanced ſomewhat in their growth, they ought to be ſo formed, that they may

(1) *Virg. Georg.* iv. 133.

lean

lean towards that ſpace which lies between the two furrows: but you muſt place between them an hedge or row of rods, which the thorns of both furrows may climb up upon, and that it may be as a prop or ſupport whereupon they may lean and reſt, till ſuch time as they be grown ſtrong: it is manifeſt, that this thorn-hedge cannot be deſtroyed, unleſs you dig it up by the very roots. Moreover, nobody doubts, but even after it has ſuffered by fire, it will grow up again the better: and this, indeed, is the way of incloſing a garden, which the antients approved moſt.

But it will be proper, if the ſituation of the land will allow it, that you make choice of a place for it, hard by the manor-houſe; eſpecially a place that is fat, and which may be watered with a rivulet running into it; or, if there be no flowing or running water, with a ſpring of well-water. But, that you may have an undoubted aſſurance, that your well will never fail, but flow all the year long, it muſt be digged when the Sun ſhall poſſeſs the laſt parts of *Virgo*, and not before, that is, in the month of *September*, before the autumnal Equinox; becauſe then the ſtrength of ſprings is moſt certainly known, and beſt found out, when the earth, by the long drought of Summer, is deprived of rain-water: but you muſt order matters ſo, that the garden be not ſituated near the threſhing-floor, leſt the winds, during the threſhing-time, carry chaff or duſt into it; for both theſe are hurtful to all ſorts of pot-herbs. Then there are two ſeaſons for trenching and putting the ground into good order, becauſe there are alſo two ſeaſons for ſowing of pot-herbs; for very many of them are ſown both in Autumn and in the Spring: nevertheleſs it is better to ſow them in the Spring, in ſuch places as are well watered, becauſe both the clemency of the growing year does kindly receive and entertain the young plants and ſeeds when they come forth, and the thirſt of Summer is quenched by the fountains and ſprings of water. But, where the nature of the place neither ſuffers you to be ſerved with water brought in by hand, nor with that which flows in of its own accord, there is, indeed, no other reſource or ſupply but the Winter-rains. Nevertheleſs, even in the drieſt places, your work may be preſerved, if the ground be trenched deeper than ordinary: and it is ſufficient to dig each gradation of it three feet deep, that ſo the ridge of the earth, that is thrown out of the trench, may riſe to four feet. But where there is the conveniency of watering plentifully, it will be ſufficient, that lay-land be turned up with a ſpade that is not too deep, that is, with an iron-tool leſs than two feet: but we muſt take care, that the land, which muſt be planted in the Spring, be paſtinated or trenched

trenched in Autumn, about the firſt of *November:* then that which we would inſtitute in Autumn, we muſt turn it up in the month of *May*, that both the glebe may be looſened, and the roots of the weeds killed, either by the Winter-colds, or the Summer-ſun; and we ought to dung it not long before: and, when the time of ſowing or planting ſhall draw near, the place muſt be cleared from herbs and weeds, and dunged five days before, and ſo carefully digged a ſecond time, that the earth may be mixed with the dung. But aſſes dung is the beſt for this uſe, becauſe it breeds feweſt weeds: the next is either that of the herds, or of ſheep, if it be macerated one year; for what men make, altho' it is reckoned moſt excellent, nevertheleſs it is not neceſſary to apply it, except to bare gravel, or to the looſeſt ſand which is without any ſtrength, where, doubtleſs, a greater ſtrength of nouriſhment is required. Wherefore we muſt ſuffer that ground, which we have deſtinated to ſow or plant in the Spring, to lie digged after the Autumn, in order to be pinched with the Mid-winter-colds, and hoar-froſts: for contrariwiſe, as the heat of Summer, ſo the violence of the cold, purges and refines the earth; and, by having fermented it, looſens it. Wherefore, when the Winter-ſolſtice is paſt, then, at laſt, dung muſt be thrown upon it; and, about the xiiith of *January*, the ground, being digged over again, is divided into beds or quarters; which, nevertheleſs, muſt be ſo contrived and formed, that the hands of the Weeders may eaſily reach to the middle of their breadth, leſt they, who ſearch after the weeds, be forced to trample upon the plants; but rather let them go in by paths, and let them weed the half of the beds by turns. What we have ſaid is abundantly enough, with reſpect to ſuch things as muſt be done before the ſowing-time.

Now let us direct what muſt either be cultivated or ſown in every ſeaſon: and firſt, we muſt ſpeak of thoſe kinds which can be ſown in two ſeaſons, that is, in Autumn and in Spring: and theſe are the ſeeds of cabbage and lettuce, of the artichoke, rocket, garden-creſſes, coriander, chervil, dill, the parſnep, ſkirwort, and of poppy; for theſe are ſown either about the firſt of *September*, or rather in *February*, before the firſt of *March:* but in dry or warm places, ſuch as thoſe of the ſea-coaſts of *Calabria* and *Apulia*, they can be committed to the earth about the thirteenth of *January*. Moreover, ſuch things as ought to be planted only in Autumn (provided nevertheleſs we inhabit a land that either lies upon the ſea-coaſt, or is expoſed to the Sun) are commonly thoſe, garlick, the little heads of onions, *African* garlick, muſtard.

But now alſo let us digeſt, by months, at what time it may be proper, for the moſt part, that every thing be committed to the earth: therefore preſently after the firſt of *January*, it will be proper to plant dittander or pepperwort. But in the month of *February* rue and aſparagus, either in the plant, or in the ſeed; and ſometimes the ſeed of the onion, and of the leek, may be put into the ground: alſo you ſhall put under-ground the ſeeds of the *Syrian* root, and of the turnep and the navew, if you have a mind to have fruit of them both in the Spring, and in Summer; for common garlick, and *African* garlick, are the laſt things that are ſet at this time. But about the firſt of *March*, in ſunny places, you may tranſplant the leek (if it is now grown big); *Hercules's all-heal* alſo in the latter part of the month of *March*. Then, about the firſt of *April*, you may tranſplant equally the leek, and elecampane, and the lateward plant of rue: alſo the cucumber, the gourd, and the caper, muſt be ſown, that they may grow up the ſooner; for beet-ſeed is then, at length, beſt ſown, when the pomegranate-tree bloſſoms: but the head of a leek is as yet tolerably well tranſplanted about the fifteenth of *May*. After this nothing ought to be put under-ground, when the Summer is coming on, except parſley-ſeed, provided you fail not to water it well; for ſo it comes up very well during the Summer. Moreover, in *Auguſt* is the third ſowing time, about the time when they celebrate the feaſt of *Vulcan*; and this is the beſt ſeaſon for ſowing the *Syrian* root, and the turnep, the navew alſo, and ſkirwort, and *Alexanders*: and theſe are the times for ſowing.

Now I ſhall ſpeak of each of theſe in particular, which require any care; and, as to ſuch of them as I ſhall paſs over, it muſt be underſtood, that they require no other pains and labour but that of the Weeder, of which we muſt ſay this once for all, that at all times particular care muſt be taken to exterminate the weeds. That kind of garlick, which ſome call *Carthaginian* garlick, but the *Greeks* call ἀφροσκόροδον, is of a much greater growth than common garlick: and about the firſt of *October*, before it is planted, it muſt be divided from one head into ſeveral; for, like common garlick, it has ſeveral cloves ſticking together; and, when theſe are divided, they ought to be planted in ridges, that, being placed in raiſed beds, they may be the leſs infeſted by the Winter-rains. But a ridge in a garden is like to that which Huſbandmen make where they ſow their champagne lands, that they may avoid and carry off the moiſture. But in gardens this muſt be made leſſer; and upon the uppermoſt part of it, that is, upon the back or riſing part of it, muſt the cloves of *Carthaginian* garlick, or of

of common garlick (for this is planted after the ſame manner) be regularly ſet at the diſtance of an hand-breadth, the one from the other: let the furrows of the ridges be half a foot diſtant from each other. Then, when the cloves have ſent forth three blades or leaves, let them be ſarcled; for the oftener this is done, the greater growth the plants attain to. Then before they make their ſtalk, it will be proper to twiſt the uppermoſt green part of it, and to lay it flat upon the ground, that their heads may grow the larger. But in regions liable to hoar-froſts, neither of theſe ought to be planted during the Autumn: for when the day is at the ſhorteſt they ſpoil and rot with the cold weather, which commonly grows mild in the month of *January*: and therefore in cold places, the beſt time for planting either common or *Carthaginian* garlick, is about the thirteenth of the foreſaid month. But at what time ſoever we ſhall either plant them, or when they are ripe, lay them up in a loft, we muſt obſerve, that the Moon be under the earth, with reſpect to thoſe places where they are either put into the earth, or taken out of it: for, being planted after this manner, and alſo laid up ſo, they are reckoned not to be of ſo very pungent a taſte, nor to give ſuch a ſtrong ſmell to the breath of thoſe that eat them. Nevertheleſs, many plant them before the firſt of *January*, in the month of *December*, in the middle of the day, if the warmneſs of the weather, and the ſituation of the ground, permit it.

Cabbage ought to be tranſplanted when it conſiſts of ſix leaves, ſo that it be ſet after its root has been firſt daubed over with thin dung, and wrapped up in three ſmall fillets of ſea-weed; for this thing has this effect, that in the boiling it becomes more quickly ſoft and tender, and preſerves its green colour without nitre. But in cold and rainy countries, the beſt time for ſetting it is after the thirteenth of *April*; the plants of which being thruſt into the ground, when they have once taken hold, the oftener they are ſarcled and dunged, as far as the Kitchen-gardener's buſineſs and intereſt will allow, the better they thrive, and the ſtronger they grow, and of a fuller growth will they make both their ſtalks and their ſprouts. Some people ſet the ſame immediately after the firſt of *March*, in ſuch places as are more expoſed to the Sun; but the greater part of it ſhoots out into ſprouts, and a top; and, when it is once cut, it does not afterwards make a large Winter-cabbage. But you may tranſplant even the greateſt cabbage-ſtalks twice; and if you do this, they ſay that they yield more ſeed, and of a greater growth.

Lettuce ought to be tranſplanted, when it has as many leaves as the cabbage. Indeed, in ſunny and maritime places, the beſt time to plant

it is in Autumn; but in inland and cold places it is otherwiſe: in Winter it is not ſo convenient to tranſplant it. But the root of this alſo ought to be daubed with dung; and it requires a greater plenty of water, and ſo it becomes of a tenderer leaf. But there are ſeveral kinds of lettuce, which muſt be ſown alſo each in its own ſeaſon; and of them that which is of a dark, and, as it were, of a purple, or of a green colour alſo, and of a curled leaf, as the *Cecilian*, is rightly ſown in the month of *January*. But the *Cappadocian*, which grows up with a pale-green ſmooth and thick leaf, is ſown in the month of *February*; then that which is white, with a leaf very much curled, as in the province of *Bætica*, and in the borders of the municipal city of *Cadiz*, is rightly planted in the month of *March*. There is alſo that of the *Cyprian* kind, of a whitiſh-red, with a light and very tender leaf, which is very conveniently planted till the thirteenth of *April*: nevertheleſs, in a climate where the Sun moſtly ſhines, lettuce may be ſown almoſt the whole year in ſuch places where there is plenty of water. And, that it may make its ſtalk the more ſlowly, when it has had ſome growth, let it receive a ſmall brick or tile in the middle of it: being checked, as it were, with this weight, it diffuſes itſelf into breadth.

The ſame method is to be obſerved with reſpect to endive alſo, excepting that it bears the Winter better; therefore it may be ſown in the beginning of Autumn, even in cold countries. We ſhall plant the ſlip or ſucker of the artichoke, to better advantage, about the autumnal Equinox, and ſow the ſeed of it more commodiouſly about the firſt of *March*, and thruſt the plant of it into the earth about the firſt of *November*; and we muſt dung it with plenty of aſhes; for this kind of dung ſeems the fitteſt for this pot-herb. Muſtard and coriander; as alſo rocket and baſil, abide in their ſeats, as they are ſown, without being removed; nor do they require any other culture, but that they be dunged and weeded: but they may be ſown not only in Autumn, but in the Spring alſo. Alſo the plants of muſtard, tranſplanted in the beginning of Winter, bring a more buſhy top in the Spring. *All-heal* is ſown, in both ſeaſons, exceeding thin, upon light and well-manured ground, that it may arrive at a greater growth: nevertheleſs it is better to ſow it in the Spring. If you would make the leek ſective, or fit for being often cut, the antients directed it to be left very thick-ſown, and ſo, when it is grown up, to be cut. But experience has taught us, that it thrives much better if you tranſplant it, and ſet it in the ſame manner as you do the headed leek, at ſmall diſtances, that is, within four inches the one from the other; and, when

when it is grown up, cut it. But, as to that which you have a mind to form into a great head, you muſt take care, before you tranſplant and ſet it again, that you cut away all its ſmall roots, and clip off the uppermoſt parts of its fibres or leaves: then little tiles or ſhells are put under-ground, and placed, as it were ſeats, under each of the plants, that ſo their heads may become of a larger growth. But the culture of the *headed leek* is continual ſarcling and dunging: neither is that of the *ſective leek* different, except that it ought to be as often watered, dunged, and ſarcled, as it is cut. In warm places its ſeed is ſown in *January*, and in cold in *February*; and, that its growth may become the greater, ſeveral grains of it are tied up in a thin linen clout, and ſo put under-ground. But, after it is ſprung up in thoſe places to which water cannot be conveyed, it ought to be tranſplanted about the time of the autumnal Equinox; but in ſuch places as you can give moiſture to, it is rightly tranſplanted in the month of *May*.

You may raiſe parſley alſo both by plants and ſeed: it chiefly delights in water, and therefore it is moſt commodiouſly placed hard by a fountain: and, if any one has a mind to raiſe it with a broad leaf, let him tie up as much ſeed of it as his three fingers can hold, in a thin linen rag, and ſo put it into little beds of earth in a regular manner: or, if he would rather have it grow up with curled leaves, let him put its ſeed into a mortar, and beat it with a willow peſtle, and clear it from its huſks; and then, when it is bound up in linnen rags, in the ſame manner put it under-ground. It may alſo, without all this pains, be made curled, whatever way it is ſown, if, when it is ſprung up, he check its growth by rolling it over with a roller. The beſt time for ſowing it is, after the fifteenth of *May* till the Solſtice; for it requires warmth.

Alſo, commonly in theſe days baſil is ſown, the ſeed of which, when it is put into the ground, is carefully thruſt into it with a beetle or roller; for if you leave the earth ſuſpended and looſe, it corrupts for the moſt part. The parſnep, ſkirret-root, and elacampane, thrive exceedingly in a place that is trenched deep and dunged; but they muſt be ſet exceeding thin, that they may grow the bigger. But it is proper, that elacampane be planted at the diſtance of three feet, becauſe it makes vaſt buſhy ſtalks, and creeps with its roots like the eye of a reed: nor do all theſe require any other culture, but that the weeds be taken away by frequent ſarcling. But the moſt proper time for putting them into the ground will be in the former part of the

month of *September*, or in the latter part of *Auguſt*. *Aliſander* (2), which ſome of the *Greeks* call ἱπποσέλινον, ſome σμύρνιον, ought to be ſown in ſeed, in a place that is well trenched, eſpecially hard by a wall; becauſe it both rejoices in a ſhade, and thrives and grows ſtrong in any place, how indifferent ſoever: and when you have once ſown it, if you do not pull it all up by the roots, but leave, and ſet apart, ſtalks of it here-and-there for ſeed, it will laſt an age, and requires but the very ſmall culture of ſarcling. It is ſown from the feaſt of *Vulcan* till the firſt of *September*, and even in the month of *January* alſo.

Mint requires a ſweet ouſy ſoil, for which reaſon it is rightly placed near a fountain in the month of *March*; and, if the plants of it ſhould happen to fail, you may gather wild mint from off fallow lands, and plant it with its tops inverted; which thing takes away its wildneſs, and makes it tame. The rue which you have ſown in ſeed in Autumn, you muſt tranſplant in the month of *March* into a ſunny place, and heap aſhes upon it, and weed it till it grow ſtrong, leſt it be killed with weeds: but it ought to be weeded with the hand well covered; for, unleſs you cover it, pernicious ulcers will breed: if nevertheleſs, through ignorance, you ſhall weed it with your naked hand, and an itching and ſwelling follow upon it, anoint it throughly with oil from time to time. Its ſhrub or ſtalk continues for many years without ſuffering any hurt, except a woman in her menſes touch it, and it wither and dry up becauſe of that.

Thyme, and garden ſavory, which comes from beyond ſea, and mother of thyme, as I have already related in a former book, are more carefully planted by ſuch as take care of bee-hives, than by Kitchen-gardeners. But we do not think it amiſs to have them alſo in gardens, by reaſon of their uſefulneſs for ſeaſoning (for they are exceeding proper for ſome ſorts of eſculents): they require a place neither fat, nor dunged, but expoſed to the Sun; for the moſt part they grow up of their own accord in the leaneſt ground: theſe are raiſed both from the ſeed, and from plants, about the time of the vernal Equinox: nevertheleſs it is better to ſet young plants of thyme; and, after they have been ſet in well-manured ground, leſt they ſtrike root ſlowly,

(2) *Olus atrum*, ſometimes by our author called *olus pullum*, commonly tranſlated *aliſander*, which, as has been ſaid, ſome think to be a corruption of the *Latin*: it is ſo called probably from the blackneſs of its root and ſeed. The *Greeks* called it *Hippoſelinum*, *i. e.* horſe lovage or parſley, either becauſe of the bigneſs of its growth, or becauſe it was given to horſes as a remedy: they alſo called it *ſmyrnium*, becauſe the juice that flows from it reſembles myrrh in taſte or ſmell. It was called by ſome ἵππειον σέλινον, of which *hippoſelinon* is only an abbreviation.

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you muſt bruiſe a ſtalk or bruſh of dry thyme in a mortar; and, after it is bruiſed, you muſt infuſe it in water the day before you deſign to uſe it; and, after the water has extracted the juice of it, you muſt pour it upon the ſtalks which you have ſet, until it has throughly ſtrengthened them, and make them take faſt hold: but *Italian* ſavory is more lively, than that you need to beſtow much trouble and pains in taking care of it. When you ſhall have planted your *dittander* or pepperwort before the firſt of *March*, you may cut it down as you do ſective leeks or chives: nevertheleſs it muſt be done ſeldomer; for it muſt not be cut after the firſt of *November*, becauſe, if it be hurt in cold weather, it utterly decays and dies: nevertheleſs it will hold out for two years, if it be carefully ſarcled and dunged: in many places alſo it prolongs its life even for ten years. The Beet is put under-ground in ſeed when the pomegranate-tree bloſſoms; and, if the garden be well watered, it is tranſplanted in Summer, as the cabbage or colewort, as ſoon as it conſiſts of five leaves: but, if the garden be naturally dry, it ought to be ſet in Autumn, ſome time after the rains are come on.

About the firſt of *October*, *chervil*, as alſo the pot-herb *orrach*, which the *Greeks* call ἀτραφαξιν (3), muſt be put under-ground, in a place that is not very cold: for, if the country has very hard winters, the plants muſt be tranſplanted from the place where they were ſeated cloſe together, and ſeparated to a greater diſtance the one from the other. The ſame method is obſerved in the ſowing of poppy and dill, as of chervil and orrach. The ſeeds of garden aſparagus, and of that which the peaſants call *corruda* (wild aſparagus) are almoſt two years in preparing: when, in a fat and well-dunged ſoil, you ſhall have put them under-ground, ſo as to place into every little trench you have made for them, as much ſeed as your three fingers can hold; commonly after the fortieth day they are twiſted and interwoven with one another, and make, as it were, an unity, or one united maſs; which ſmall roots, thus twiſted and connected, the Kitchen-gardeners call *ſponges*: and it is proper, that, after twenty-four months, they be tranſplanted into a ſunny place, ſufficiently moiſt, and well dunged: but the trenches or furrows are made at the diſtance of one foot the one from the other, and not more than three-fourths of a foot in

(3) Ἀτραφαξις, *atriplex*, *orach*. *Pliny* ſays, that *Pythagoras* blamed this pot-herb as the cauſe of dropſies, jaundice, paleneſs, *&c.* and ſome pretend, that its *Latin* name intimates, that it makes ſuch as eat it pale and diſcoloured: but, whatever there is in this, its *Greek* name, which ſome pretend to be made up of two words, ἀθρόως αὐξει, from its quick growth, ſeems more expreſſive of its nature; for it comes forth, as *Pliny* ſays, the 8th day, and is fit for eating the 15th.

depth, into which the little ſpunges are ſo thruſt down, that, after the earth is put upon them, they may eaſily ſpring up. But, in dry places, the ſeeds or plants muſt be placed in the lower parts of the furrows, that they may abide, as it were, in little chanels or troughs: but in ſuch as are ouſy, on the contrary, they muſt be placed in the uppermoſt back of the ridge, leſt they be hurt with too much moiſture. Then the firſt year, after they have been thus planted, the aſparagus, which they ſhall ſend forth, muſt be broken off ſhort; for if you ſhould pull it up from the bottom, the little roots being as yet tender and weak, the whole little ſpunge will follow: the reſt of the years it muſt not be cropped, but plucked up by the root; for, unleſs you do ſo, the ſtalks that are broken off ſhort, hurt, and give pain to the eyes of the ſpunges, and, as it were, blind them, and do not ſuffer them to put forth the aſparagus. Moreover, every ſtalk, which ſprings up laſt in Autumn, muſt not be intirely taken away, but ſome of them muſt be left, and ſet apart for ſeed. Then, after it has made its prickle, the ſeeds themſelves being gathered, the haulm muſt be throughly burnt in its own place, juſt as it is; and then all the furrows muſt be ſarcled, and raked at the ſame time, and the weeds taken out of them; and preſently after, either dung or aſhes thrown into them, that the juice of them, trickling down with the rains the whole Winter, may come to the root. Then in the Spring, before it ſhall begin to ſprout, let the earth be ſtirred with a forked iron-tool, that the ſtyle may the more eaſily ſpring up, and ſhew itſelf, and become thicker and fuller when the ground is looſened.

The radiſh root is rightly ſown twice in the year; in the month of *February*, when we expect fruit of it in the Spring; and in the month of *Auguſt*, about the feaſt of *Vulcan*, when we expect it earlier: but this time of ſowing it is, without doubt, eſteemed the beſt. The care to be taken of it is, that it be ſown in ground that is well dunged and manured; and, after it is arrived to ſome growth, that it be earthed from time to time; for if it emerge, or ſhoot up above the earth, it will become hard and ſpungy.

The cucumber and gourd, when there is plenty of water, require leſs care; for they are very much delighted and helped with moiſture. But, if they muſt be ſown in a dry place, where there is not the conveniency of watering them, in the month of *February* furrows, of the depth of one foot and an half, muſt be made. Then after the fifteenth of *March*, almoſt the third part of the depth of the furrow muſt be covered with ſtraw put into it; then well-dunged earth muſt be thrown into it, till it come up to the middle of the furrow;

furrow; and, after the ſeeds are put into them, they muſt be continually watered, till they ſpring up; and, after they have begun to thrive and grow ſtrong, their growth muſt be promoted and forwarded by adding earth to them, till the furrow be filled up, and made even: the ſeeds, being thus cultivated, will thrive well enough, and be in a good ſtate the whole Summer, without watering, and will yield fruit of a more delicious taſte than ſuch as are watered. But, in watery places, the ſeed muſt be put into the ground as ſoon as poſſible; nevertheleſs not before the firſt of *March*, that it may be tranſplanted when the Equinox is paſt: and take this ſeed out of the middle of the gourd, and place it in the ground with its top inverted, that it may be of a vaſter growth; for when they are throughly dried, they may be uſed as veſſels, as the *Alexandrian* gourds are. But, if you prepare them for eatable-ſtuff, you muſt take the ſeed out of the neck of the gourd, and ſet it with its top upright; by which means its fruit will grow up both longer and ſmaller, which certainly brings a greater price than the others. But care muſt be taken, that as ſeldom as can be, a woman be admitted into that place wherein either the cucumber, or the gourd, is planted: for, commonly, green things languiſh, and are checked in their growth by her handling of them. But if ſhe be alſo in her menſes, ſhe will kill the young offſpring alſo with her look. A cucumber becomes tender, and exceeding agreeable to the taſte, if you ſoak its ſeed in milk before you ſow it: ſome alſo, that it may be the ſweeter, do it in mead. But any perſon that is deſirous to have the fruit of the cucumber earlier ripe than ordinary, let him ſhut up well-dunged earth in a caſe, or oſier-baſket, and ſow the ſeed therein, and give it moderate moiſture. Then, when the ſeeds are ſprung up, let him place them in the open air, in mild and warm ſunny days, hard by the houſe, that they may be protected from every blaſt of wind. But in cold and ſtormy weather, let him bring them back again into the houſe; and let him conſtantly do this till the vernal Equinox be paſt: afterwards let him put down the whole baſket into the ground; for thus he ſhall have early fruit. Alſo, if it be worth the while, little wheels may be put under larger vaſes, that they may be brought out with leſs labour, and harboured again in the houſe: but, notwithſtanding, they ought to be covered with glaſſes (4), that in cold weather alſo, when the days are clear,

(4) *Specularibus*. Though this word is tranſlated *glaſſes*, as being agreeable to the modern practice in this thing; yet by *ſpecularis*, I ſuppoſe, the author means a certain tranſparent ſtone, which they clove and cut into as ſmall pieces as they pleaſed, and uſed them for their windows, to keep out the winds and let in the light, *&c.* as they did afterwards with glaſs. This ſtone, it ſeems, was firſt found in *Spain*, and afterwards in ſeveral other countries, as *Pliny* ſays; and, as *Seneca* ſays, was not in uſe before his days.

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they may be ſafely brought forth to the Sun. By this method *Tiberius Cæſar* was provided with cucumbers almoſt the whole year (5). But we read in *Bolus Mendeſius*, an *Egyptian* author, that this is done with much leſs trouble: he directs us to keep in our gardens, in a place expoſed to the Sun, and well dunged, brambles and fennel-giants planted in rows one after another by turns: then, after the Equinox is paſt, to cut them a little below the ground; and after having, with a wooden bodkin, looſened the pith either of the fennel-giant or bramble, to put dung into them, and ſo put the ſeeds of the cucumber into them, which by their growth may cloſely unite with the brambles and fennel-giants; for thus they are not nouriſhed by their own, but, as it were, by their maternal root; and the ſtock, thus ingrafted, will alſo in cold weather yield the fruit of the cucumber. The ſecond ſeaſon they obſerve for ſowing this ſeed, is commonly at the feaſt of *Minerva*, after the middle of *March*.

The *caper-buſh*, in very many provinces, grows of its own accord in fallow lands; but, in ſuch places where there is a ſcarcity of it, if it muſt be ſown, it will require a dry place; and that ought to be ſurrounded with a ſmall ditch before-hand, which may be filled with ſtones and lime, or *Carthaginian* clay, that it may be, as it were, a certain intrenchment, that the ſtalks of the foreſaid ſeed may not be able to break through it, which commonly ſpread themſelves almoſt over the whole land, unleſs they be hindered by ſome fence or mound: which thing, nevertheleſs, is not of itſelf ſo great an inconveniency, (for they may be rooted out from time to time) as that they contain an hurtful poiſon, and with their juice make the ground barren. It is ſatisfied with very little or no culture; for it is a thing that grows up and thrives even in untilled lands, without any pains of the Huſbandman. It is ſown at the time of both the Equinoxes.

An onion-bed requires earth that is frequently manured, rather than that which is turned up deeper than ordinary: therefore the ground ought to be cut up from the firſt of *November*, that it may rot with the Winter colds and froſts; and, after an intermiſſion of forty days, digged a ſecond time; and then, after twenty-one days, digged a third time, and preſently dunged; and then, after it is equally and thoroughly digged with ſpades, divided into beds or quarters, after all the roots

(5) *Pliny*, in his ninth book, *cap.* 5. mentions the great liking that the Emperor *Tiberius* had to cucumbers: perhaps both *Pliny* and *Columella* take the word in its largeſt ſignification, as ſignifying melons alſo; and then *Tiberius*'s fondneſs for them may be better accounted for, this fruit being extremely delicious in many places of *Italy*, and the *Italians* great eaters of it.

have

have been pulled up and deſtroyed. Then, about the firſt of *February*, it may be proper, that, on a clear bright day, the ſeeds be ſcattered; with which ſome ſeed of ſavory muſt be intermixed, that we may have that alſo; for it is both agreeable to eat when it is green; and when it is dry, it is not uſeleſs for ſeaſoning broth, or any other dainty diſhes. An onion-bed ought to be ſarcled not leſs than four times at leaſt, or even oftener. If you have a mind to make proviſion of the ſeed of it, in the month of *February* ſet the largeſt heads of the *Aſcalonian* kind (6), which is the beſt, four or even five inches diſtant from each other; and when they begin to thrive well, do not ſarcle them leſs than three times: then, after they have made their ſtalk, preſerve the ſtiffneſs of their ſtalks by placing low rails, as it were, of ſmall ſtakes among them; for unleſs you place reeds croſſwiſe among them, very cloſe upon each other, after the manner of frames in a vineyard, the ſtalks of the onions will be thrown down by the winds, and all the ſeed will be ſhaken out; which, indeed, muſt not be gathered before it begins to grow ripe, and to have a black colour. But you muſt neither ſuffer it to grow throughly dry and withered, nor to fall all to the ground; but the ſtalks muſt be pulled up intire, and dried in the Sun.

There are two ſeaſons for ſowing the turnep and the navew, and they require the ſame culture as the radiſh: nevertheleſs, the beſt time for ſowing them is in the month of *Auguſt*. A *jugerum* of land requires four *ſextarii* of their ſeed; but ſo, that, over and above this meaſure, it may receive a little more than an *hemina* of the ſeed of the *Syrian* root. Let him who ſhall ſow theſe ſeeds in Summer have a care, that the gnat or little fly, by reaſon of the droughts, do not deſtroy the yet tender leaves, when they are creeping forth. That this may be alſo prevented, the duſt which is found upon an arched roof, or the ſoot alſo which ſticks to the roofs above the hearths, ought to be gathered; then the day before the ſowing, to be mixed with the ſeeds, and ſprinkled with water, that they may imbibe the juice the whole night; for the ſeeds being thus ſoaked, they may be ſafely ſown the next day. Certain antient authors, as *Democritus*, direct us to medicate all ſeeds with the juice of the herb they call *houſleek*, and to uſe the ſame remedy againſt the little vermin, which experience has taught us to be true. But yet we more frequently make uſe of the ſoot, and the duſt before-mentioned: becauſe there is but

(6) *Aſcalonii generis*. *Pliny*, *lib.* xix. *cap.* 6. ſays, that this ſort of onion had its name from *Aſcalonia*, a town in *Judea*; and Father *Hardouin* thinks they are what the *French* call *eſchalotes*, ſtill retaining ſomething of their former name.

a ſmall quantity of this herb to be had; and by theſe we preſerve the plants in ſafety commodiouſly enough. *Hyginus* thinks, that, after the threſhing, the turnep-ſeeds ought to be ſcattered upon the ground, while the ſtraw and chaff are as yet lying in the threſhing-floor; becauſe their heads become the larger, when the hardneſs of the ground that lies under them, does not ſuffer them to deſcend deep into the earth: we have often tried that without any ſucceſs; therefore we think, that the turnep, the radiſh, and the navew, are better ſown in well-manured ground. And the Huſbandmen, that are more religious than ordinary, do as yet obſerve the cuſtom of the antients, who, when they ſow them, pray, *That they may grow both for themſelves, and for their neighbours.* In cold places, where they are afraid, leſt what they ſow in Autumn may be chilled with the froſts in Winter, they make low rails with reeds, and place rods acroſs upon them, and throw ſtraw upon the rods, and ſo defend the ſeeds from the hoar-froſts. But, in regions expoſed to the Sun, where, after the rains, thoſe noxious animals we call *palmer-worms*, but in the *Greek* language are called κάμπαι (7), fall upon them, they ought either to be gathered by hand, or early in the morning the ſtalks of the pot-herbs ſhould be ſhaken; for thus, if, while they are as yet ſtiff with the cold of the night, they fall down, they cannot afterwards creep up to the higher part. Nevertheleſs it is needleſs to do this, if, as I ſaid before, the ſeeds be macerated, before they are ſown, with the juice of the herb *houſleek*; for the palmer-worms do no manner of hurt to them, when they are medicated after this manner. But *Democritus*, in that book which, in *Greek*, is intituled περὶ ἀντιπαθῶν (8) affirms, that theſe ſelf-ſame beaſts are killed, if a woman, in her menſes, go with her hair looſe, and bare-footed, thrice round each bed in the garden; and that, after this, all the little worms will fall down, and ſo die.

(7) Κάμπη, a palmer-worm, has its name from its many joints, and bending itſelf in many different parts when it creeps.

(8) Περὶ ἀντιπαθῶν, ſome read it ἀντιπαθειῶν. If the firſt be the true reading, then ἀντιπαθὲς may ſignify the ſame as *antipharmacon*, a remedy in general againſt any diſtemper: but, if the ſecond be right, as probably it is, then ἀντιπάθεια ſignifies a repugnancy between two things, becauſe of contrary qualities; as between fire and water, *&c.* or the virtue or power that a thing may have of reſiſting, or relieving from, and aſſiſting againſt, the hurtful quality of ſome other thing. *Democritus* wrote περὶ ἀντιπαθειῶν καὶ συμπαθειῶν, of which there is only a fragment remaining, which is publiſhed in *Fabricius's Bibl. Græc.* wherein there is nothing of this ridiculous ſtory; only, that in a garden caterpillers will die, if you boil thoſe of another garden in water, and ſprinkle the garden therewith.

Thus

Thus far have I thought it proper to give directions concerning the culture of gardens, and the offices of a Bailiff: and, though I have already given it as my opinion, in the firſt part of this book, that he ſhould be well inſtructed and learned in all manner of buſineſs relating to Huſbandry; nevertheleſs, becauſe it moſt commonly happens, that our memory of the things we have learned fails us, and that it muſt be frequently renewed from notes, and abſtracts, and memorandums of things, I have ſubjoined the arguments or contents of all my books, that whatever thing ſhould be ſought for, and after what manner every thing ſhould be done, might be eaſily found out, whenever there ſhould be occaſion for it (9).

(9) From this laſt paragraph there ſeems to be ſome reaſon to think, that *Columella* deſigned to have finiſhed here; but he changed his mind, and probably forgot to change this paragraph. There is alſo ground to think, that he compoſed an index to his work; probably like that of *Pliny* and *Aulus Gellius*: but it is now loſt, or torn in pieces and mangled by thoſe who divided his books into chapters, to which they prefixed arguments taken out of the index; and in many places not very judiciouſly.

L. JUNIUS MODERATUS COLUMELLA

OF

HUSBANDRY.

The TWELFTH and Laſt BOOK.

The Bailiff's Wife.

The PREFACE.

XENOPHON the *Athenian*, in that book, *Publius Silvinus*, which is intituled his *Oeconomic* (1), has declared, that the matrimonial union is ſo wiſely ordered and deviſed by Nature, that not only the moſt agreeable, but alſo the moſt profitable ſociety and partnerſhip in life, might be entered into; which, not long ago, *Cicero* alſo ſaid: and leſt mankind ſhould, in proceſs of time, utterly periſh, for this reaſon a Man and a Woman were joined together: moreover that, from this ſame ſociety, there might be prepared for mortals not only helps and ſupports, but alſo defences for their old age. Yea further, conſidering that food, clotheing, and other things neceſſary for mankind, were not to be prepared for them, as for wild beaſts, in the open air, and in woods and foreſts, but at home, under a roof, it was neceſſary, that one of the two ſhould be abroad, and in the open air, who, by labour and induſtry, might procure and provide the ſame; and the other within doors, who might lay them up

(1) *Oeconomicus*. This *Greek* word, though moſtly uſed as an adjective, yet by *Xenophon*, and ſome others, it is frequently uſed as a ſubſtantive, and ſignifies one that has skill, prudence, and dexterity in the management of domeſtic affairs. *Columella* has here given us the ſubſtance of what *Xenophon* has ſaid upon this ſubject, without confining himſelf to his very words; and, as he takes notice of *Cicero*'s having tranſlated this books, it is probable he made uſe of his words: but this cannot be affirmed for certain, ſince we have not that tranſlation.

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in houſes, and watch over and keep them ſafely; foraſmuch as it was neceſſary for us, either to practiſe Huſbandry, or Navigation, or carry on ſome other kind of buſineſs, that we might acquire ſome worldly ſubſtance. But, when the things acquired were brought together under our roof, it was alſo neceſſary that there ſhould be another, who might watch over and keep them, after they were brought in, and do all ſuch other buſineſs as ought to be managed and done at home: for both the corns, and the other things, which the earth produces for our ſuſtenance, ſtood in need of an houſe to cover them; and it was neceſſary, that the offspring of ſheep, and the increaſe and produce of other ſorts of cattle, ſhould be ſafely kept in a cloſe and ſecure place; as alſo the other things that are uſeful and neceſſary for the ſuſtenance, clotheing, accommodation, and conveniency of mankind. Wherefore, ſince the things we have mentioned did require both pains and diligence, and that ſuch things as it was neceſſary ſhould be ſafely kept, and taken care of at home, were not with ſmall care acquired abroad; it was rightly ordered and provided, as I ſaid, by Nature, that domeſtic diligence ſhould be the buſineſs and taſk of the Woman; and that of the Man, all buſineſs tranſacted abroad and without-doors. Therefore Nature has allottted to Man the ſuffering of heat and cold, as alſo journeys, and the labours and fatigues both of peace and war; that is, all the laborious buſineſs of Huſbandry, and Military Service: moreover, to the Woman, becauſe Nature had made her inhabile for all theſe things, ſhe committed the care of domeſtic affairs: and, becauſe ſhe had aſſigned diligence, and the cuſtody and charge of things, as the proper buſineſs of this ſex; therefore ſhe made it more timorous than that of the male: for *fear* contributes very much to the diligence that is requiſite for the cuſtody and preſervation of any thing.

And becauſe it was neceſſary, that they who ſeek their living without-doors, and in the open fields, ſhould ſometimes repel injuries; therefore ſhe has made the Man more courageous and bolder than the Woman. But becauſe, after they had acquired riches, they ſtood both equally in need of memory and diligence, ſhe has not given a leſſer ſhare of theſe things to the Woman, than to the Man. Moreover, becauſe ſimple Nature would not, that any one of them ſhould comprehend all things commodious for them, therefore ſhe willed, that the one ſhould ſtand in need of the other; becauſe what is wanting to the one, is, for the moſt part, in the poſſeſſion of the other. Theſe things did *Xenophon*, and after him *Cicero*, who tranſlated him into *Latin*, not unprofitably diſcourſe of. For both among the *Greeks*, and afterwards among

among the *Romans*, even down to the memory of our fathers, the Matron took all the domeſtic labour upon herſelf; the Maſters of families, when they laid aſide all care of public affairs, and buſineſs without-doors, retiring into their own houſes, as into a place of reſt: for the higheſt reverence and regard were mixed with concord and diligence, and the beautifulleſt Woman did burn with emulation to excel in diligence, ſtudying, by her care, to inlarge and make better the affairs and circumſtances of her Huſband. There was no ſeparate or divided intereſt ſeen in the houſe, nothing that either the Huſband or the Wife would properly call their own; but they both conſpired together for their common and mutual advantage, that ſo the diligence and carefulneſs of the Wife might amount to an equal proportion of induſtry, with the buſineſs and affairs tranſacted without-doors. Therefore neither the Bailiff, nor his Wife, had much buſineſs to do, when their Maſter and Miſtreſs themſelves did daily review, overſee, and manage their own affairs. But now-a-days, when moſt part of Wives are ſo diſſolved in luxury and idleneſs, that they do not, indeed, vouchſafe to take upon themſelves the care of manufacturing wool for their own cloaths, but diſdain and ſet light by cloaths made at home, and with a perverſe deſire, by fair words, obtain from their Huſbands others that are more coſtly, which are purchaſed with great ſums of money, and coſt almoſt the whole yearly income of their eſtates; it is no wonder at all, that theſe ſame Ladies think themſelves mightily burdened with the care of rural affairs, and of the implements of Huſbandry, and eſteem it a moſt ſordid and mean buſineſs, to ſtay a few days in their country-houſes: for which reaſon, ſince that antient cuſtom of the *Sabine* and *Roman* Miſtreſſes of families is not only intirely grown out of faſhion, but alſo quite extinct; the buſineſs and office of the Bailiff's Wife, as a Keeper of the Manor-houſe, is crept in as neceſſary, that ſhe might perform the offices, and do the buſineſs of the Matron: foraſmuch as the Bailiffs alſo have ſucceeded, and come into the room of their Maſters, who, formerly, by antient cuſtom, did not only practiſe Huſbandry, but dwelt in the country alſo. But, leſt I ſhould ſeem to have unſeaſonably taken upon me the office of a Cenſor, in reproving the manners of our own times, I ſhall now go on to deſcribe the offices of the Bailiff's Wife.

CHAP.

CHAP. I.

Of the Care that the Bailiff's Wife ought to take of the Houſhold-affairs; and of the Precepts ſhe ought to obſerve.

MOreover, (that we may keep to the method we have laid down, which we began in the preceding book) (1) the Bailiff's Wife ought to be a young Woman, that is, not too much of a Girl, for the ſame reaſons we mentioned, when ſpeaking of the age of a Bailiff: ſhe ought alſo to be of ſound health, and in her perſon neither ugly, nor yet exceeding beautiful and handſome: for a ſound and robuſt conſtitution will enable her to ſupport both watchings, and other fatigues and labours: uglineſs will make her Mate loath and abhor her, and too great beauty will make him lazy and ſlothful. Therefore we muſt take care, that we neither have a Bailiff that is unſettled, and always wandering abroad, and has an averſion to be at home with his Wife; nor, on the other hand, one that is lazy, and loiters at home, always lolling in his Wife's arms.

But the things we have mentioned are not the only precautions we muſt take with reſpect to the Bailiff's Wife; for, among the firſt things, it muſt be conſidered, whether ſhe be very far from being addicted to wine, delicious fare, ſuperſtitions, ſleepineſs, and drowſineſs, and keeping company with men, that ſhe may have a concern and care upon her mind, about what ſhe ought to remember, and what it is ſhe is to make proviſion for, and to take care of for the future, that, for the moſt part, ſhe may obſerve and keep to the ſame way and manner of acting, as we commanded the Bailiff to obſerve: becauſe the Huſband and the Wife ought to be like to one another in moſt things; and that ſhe be as ready to avoid what is evil, as to hope for a reward of ſuch things as ſhe has done well: alſo that ſhe uſe her utmoſt endeavours, that the Bailiff employ himſelf as little, in buſineſs within-doors, as poſſible; his buſineſs being to go forth with the ſervants early in the morning, and to return with them fatigued, in the twilight, after they have finiſhed their work.

Nevertheleſs, by inſtructing the Bailiff's Wife, we by no means diſpenſe with the Bailiff's care of houſhold-affairs, but we only alleviate his labour, by giving him an aſſiſtant. But the ſeveral offices

(1) He means the 11th, wherein he treated of the qualifications of a Bailiff.

and

and duties, to be performed within-doors, muſt not be wholly left to the Woman's province; but they muſt be ſo delegated to her, that, from time to time, they may be alſo under the obſervation and eye of the Bailiff: for thus the Bailiff's Wife will be more diligent, if ſhe remembers, that there is one there, to whom ſhe muſt frequently give an account.

Moreover, ſhe ought to be fully perſuaded of this, that it is incumbent upon her to ſtay at home, either wholly, or, at leaſt, for the moſt part; both that ſhe may ſend ſuch ſervants out of doors, as have buſineſs to do in the fields; and to keep ſuch of them within the walls, as have any thing to do in the manor-houſe; and to obſerve, that they do not neglect their buſineſs, by ſitting long ſtill, and doing nothing; and carefully to examine and inſpect ſuch things as are brought into the houſe, and ſee if there be no part of them imbezzled; and ſo, after they are examined and found ſound and intire, to receive them into her cuſtody; then to ſet apart ſuch things as are deſigned for conſumption; and to keep carefully ſuch things as can be ſaved, and that remain over and above the daily expence, that ſo the proviſion of the whole year may not be ſpent in one month.

Moreover, if any one of the family begin to be in a bad ſtate of health, ſhe muſt ſee, that he be well tended, and ſerved with every thing convenient for him, as much as is poſſible: for from this kind of care ſpring benevolence and obſequiouſneſs. As alſo they, who have recovered their health, ſtudy to ſerve more faithfully than before, when there is due care taken of them when they are ſick.

CHAP. II.

After what Manner ſhe ought to manage the Proviſions, or the Store-houſes.

AFTER all this, beſides theſe things, ſhe ought to remember what things are brought into the houſe, that they be laid up in proper and wholſome places, that they may continue there without receiving any damage: for there is nothing that we ought to be more careful of, than to prepare places where every thing may be laid up ſafely, that it may be brought out, and produced again, when there is occaſion for it. What ſort of places theſe ought to be, we have already

already told you, both in the firſt book, when we gave a plan and deſcription of a manor-houſe; and in the eleventh, when we diſcourſed of the office of a Bailiff: but, even at this time, we ſhall not think it any great trouble, briefly to demonſtrate and explain them.

The higheſt room of the houſe requires the veſſels and the cloaths of the greateſt value: moreover, a ſtore-houſe that is dry, and free from moiſture, is reckoned proper for corn; that part of the houſe which is cold, is moſt commodious for keeping wine with ſafety: that part which is well lighted, demands the houſhold-furniture that is brittle, and ſuch ſorts of work to be done therein, as ſtand in need of much light.

Therefore having prepared the receptacles, ſhe muſt lay up and diſpoſe every thing in its place, according to its kind, and alſo ſome things particularly by themſelves, that ſo ſhe may the more eaſily lay her hand upon them, when there ſhall be occaſion to uſe them: for it is an old proverb, That it is the moſt certain poverty, when you ſtand in need of any thing, not to be able to make uſe of it, becauſe you know not the place where the thing, which you want, lies careleſsly thrown by. Therefore, in the management of family-affairs, negligence is the occaſion of more labour than diligence.

For who is he that doubts, that there is nothing more beautiful, in every ſtate and condition of life, than order and regularity? which we have frequent occaſion to obſerve, and take notice of, even in ludicrous ſhews: for, when the chorus of the Singers does not agree in certain meaſures and cadences, nor keep time and proportion with the Maſter that beats the time, and directs them, they ſeem to them that hear them, to ſing ſomething that is diſſonant, harſh, confuſed, and diſorderly: but when, as it were, with one conſent, they all conſpire and agree in certain numbers and meaſures, and ſo form a concert; from ſuch an agreement of voices there is formed a certain ſound, which is not only pleaſant and delightful to the Singers themſelves, but alſo the ſpectators and hearers are charmed and raviſhed with the greateſt pleaſure and delight.

In an army alſo, neither the General, nor the Soldier, can be able to execute any thing whatſoever, without order, and a right diſpoſition of things; ſeeing the armed man puts the unarmed into diſorder; the horſeman the foot-ſoldier; and the waggons and carriages the cavalry; if they be mixed and jumbled together. This ſame method, of having every thing in readineſs beforehand, and of obſerving a due order in every thing, is of great uſe and advantage on ſhip-

board alſo: for when a ſtorm comes on, and the ſhip is in right order as it ſhould be, the tackling, and every other thing belonging to it, being placed in its proper order, and in its own place, the Boatſwain, or any other perſon whoſe buſineſs it is, brings it out without being in a conſternation, when the Maſter of the ſhip calls for it.

Now if theſe things are of ſo great importance, either in theatres, or in armies, or even in ſhips, there is no doubt, but the buſineſs of the Bailiff's Wife requires order, and a due diſpoſition of ſuch things as ſhe lays up: for every particular thing is the more eaſily viewed and examined, when it is aſſigned to its own place; and, if any thing happens to be out of its place, the empty place itſelf puts her in mind to make inquiry after what is wanting: and if there be any thing that ſhould be taken a particular care of, or adjuſted, and make fit for uſe, it is the more eaſily taken notice of, when it is reviewed and numbered in its own rank or order: concerning all which *M. Cicero*, following the authority of *Xenophon* in his *Oeconomic*, thus introduces *Iſchomachus* narrating theſe things to *Socrates*, who queſtioned with him concerning the ſame.

CHAP. III.

Of the Diſtribution of the Implements of Huſbandry, and the Houſhold-furniture.

AFTER we had prepared proper places, we began to diſtribute the tools, implements of Huſbandry, Houſhold-furniture, and every thing belonging to a family: and, firſt of all, we placed by themſelves all thoſe things we are wont to make uſe of in celebrating divine ſervice; afterwards the Womens apparel, which is provided for holy-days, then the Mens apparel; alſo their dreſs for ſolemn days; as alſo ſhoes ſuitable for both ſexes: then alſo arms, darts, and arrows were laid apart by themſelves; and, in another place, all the tools they make uſe of for manufacturing of wool.

After which things were placed the veſſels they are wont to make uſe of for dreſſing of victuals; then were ſet in view the things which belonged to waſhing and bathing, and what things were neceſſary for elegant dreſs and apparel, and what belonged to our daily table, and to feaſting and banquetting: afterwards, out of ſuch things as we uſe daily, we ſet apart what might ſuffice for one month; and what might

might ſuffice for the whole year alſo we divided into two parts; for thus we cannot be ſo eaſily deceived as to the time they will laſt, and when they will be at an end.

After we had ſet all theſe things by themſelves, then we diſpoſed and placed them in due order, every thing in its own place: then ſuch things as the ſervants uſe daily, and ſuch as belong to the manufacturing of wool, cooking, and dreſſing of victuals, theſe very things we delivered to the perſon who is wont to uſe them, and pointed out the places where they ſhould put them, and gave them charge to keep them ſafely.

But ſuch things as we make uſe of upon holy-days, and when ſtrangers come to our houſe, and upon other certain occaſions, which rarely happen; theſe we delivered to the Larderer, and pointed out a particular place for every one of them; and we counted over to every one the things they were to take the charge of; and, after we had counted them over, we ſet them down in writing ourſelves; and admoniſhed him, that whatever thing there might be occaſion to uſe, he ſhould know from what place he ſhould give it, and remember, and mark down, what, and when, and to whom he had given it; and that he ſhould put every thing again in its own place, when he received it back again.

Theſe precepts of induſtry and diligence the antients have delivered to us in the perſon of *Iſchomachus*; and we now explain and point them out to the Bailiff's Wife, who is employed as an Houſekeeper. Nor yet muſt her care be confined to this one thing, to lock up, and keep ſafely, ſuch things as are brought into the houſe, and which ſhe ſhall receive into her cuſtody; but let her review and examine them from time to time, leſt either the houſhold-furniture, or the garments that are laid up in the wardrobe, receive damage, and be ſpoiled, or grow mouldy with moiſture, and lying-by; or the fruits of the earth, or any tools and utenſils be ſpoiled and rot through her neglect and lazineſs.

But in rainy days, or in cold and froſty weather, when a Woman cannot go about any rural work in the open air, in order that ſhe may be put to manufacturing of wool, let the wool be prepared and combed beforehand, that ſhe (the Bailiff's Wife) may the more eaſily go through with, and exact the uſual taſk of ſpinning and weaving; for it will do no hurt, if garments fit for ſervants be made at home, for herſelf, the Factor or Agent, and others in a more honourable ſtation in the family, that the Maſter of the family's accounts may be leſs burdened, and his charges leſſened.

Moreover, this alſo ſhe muſt conſtantly watch over, and be particularly careful of, that, when the ſervants are already gone forth out of the manor-houſe, ſhe ſearch and look for thoſe whoſe buſineſs it is to be abroad, and employed in works of Huſbandry without-doors: and, if any one of them, boggling and ſauntering within-doors, (as it happens) has eſcaped the care of her Mate, that ſhe inquire after the cauſe of his idleneſs, and examine and find out whether he has ſtayed behind, and has been hindered by indiſpoſition, and want of health, or has only ſkulked through idleneſs and ſloth; and, if ſhe ſhall find him even counterfeiting feebleneſs, and want of ſtrength; let her conduct him, without any further delay, into the infirmary; for it is better, that a ſervant, who is fatigued with his work, ſhould reſt a day or two, under cuſtody, than contract a real illneſs by too much labour.

In fine, ſhe muſt remain in one place as little as poſſible, for her's is not a ſedentary buſineſs; but ſhe ought ſometimes to come to the web, and give inſtruction, if there be any thing ſhe knows better than they; if not, to learn from him who may underſtand and know more than ſhe does; at other times ſhe ought to come and look over them that are cooking and dreſſing the victuals for the family: as alſo to take care, that the kitchen, and the ox-ſtalls, as alſo the mangers, be made clean: alſo to open the infirmaries from time to time, even ſuppoſe they have no ſick people in them, and to clear and free them from all manner of dirt and naſtineſs, that, when neceſſity ſhall require it, they may be conſigned in good order, and in a clean, neat, and wholſome condition, to ſuch as are ſick and languiſhing.

Alſo ſhe ought to come unawares upon thoſe who have the overſight, and charge, and giving out of the proviſions, and are Keepers of the ſtores, when they are weighing or meaſuring any thing: as alſo to be preſent with the Shepherds, when they are milking the ewes in the folds, or putting the lambs, or the young of other cattle, to the dug: ſhe ought alſo to be preſent at the ſheep-ſheering, and gather up the fleeces carefully, and count the fleeces, and compare them with the number of the ſheep: alſo to inſiſt, and be very preſſing, with them that have the care of the porch, that they ſet out and air the houſhold-furniture; and that the irons and the iron-tools be ſcoured and made bright, and freed from ruſt; and that the reſt of the things, if they want mending, be delivered out to the proper Workmen to be mended, and make fit for uſe.

Laſtly, after all theſe things are put into due order, I do not think, that this diſtribution will be of any advantage, unleſs, as I have ſaid, the

the Bailiff very frequently, and even the Maſter and the Miſtreſs of the family, remark and take notice, how the eſtabliſhed order and method is obſerved. Which thing alſo has been conſtantly obſerved in cities, where right policy and good manners have been eſtabliſhed, whoſe chief and principal men did not think it enough to have good laws, unleſs they created the moſt diligent citizens Guardians of the ſame, which the *Greeks* call νομοφύλακας (Guardians of the laws): their office was to beſtow praiſes and commendations, as alſo honours, upon thoſe who obeyed the laws, but to mulct and puniſh thoſe who were diſobedient: which is now, indeed, the buſineſs of the Magiſtrates, who, by conſtant adminiſtration of juſtice, preſerve and maintain the power of the laws. But let it ſuffice to have delivered theſe things in general, as abſolutely neceſſary to the right management and government of a family.

CHAP. IV.

What Kinds of Veſſels ſhe ought to prepare for ſalting and pickling Proviſions, and for Conſerves.

NOW we ſhall give directions about the other things which were omitted in the former book, becauſe we reſerved them for the offices of the Bailiff's Wife; and, that ſome order may be preſerved, we ſhall begin with the ſpring of the year, becauſe both the early and the trimeſtrian ſowings being finiſhed, then there happen vacant times for executing thoſe things we ſhall hereafter teach.

The hiſtorical records of former times inform us, that the *Carthaginian* and *Greek* authors, as alſo the *Roman*, were not wanting in their care of ſmall things: for both *Mago* the *Carthaginian* (1), and *Hamilcar* (2), which *Mnaſias* and *Paxamus*, no obſcure authors of

(1) *Mago* the *Carthaginian* has been already mentioned, *lib.* i. *c.* 1. as the Father of Husbandry; and, no doubt, the author mentions him again, in this place, to intimate, that, although he was ſo eminent a perſon, and whoſe buſineſs, as a ruſtic writer, was chiefly to teach the art of Agriculture; yet he did not diſdain to deſcend even to the ſmalleſt parts of the œconomy of a family.

(2) It is not certain who this *Hamilcar* was; probably he was the Father of *Hannibal*, but neither *Varro* nor *Pliny* mention him as a ruſtic writer. *Mnaſias* is mentioned by *Varro* and *Pliny*, as alſo by *Athenæus*: he was of *Patara*, a city of *Lycia* in *Leſſer Aſia*. *Paxamus* is not mentioned neither by *Varro*, nor *Pliny*, nor *M. Ambivius*, nor *Manas Licinius*; but *Caius Matius* is mentioned by *Tacitus*: he lived in the time of the Emperor *Auguſtus*, whoſe favourite he ſeems to have been.

the

the *Greek* nation, ſeem to have followed; as alſo ſome of our own country, after they had reſt from wars, did not think it below them to contribute, as it were, a ſort of tribute for the ſuſtenance of mankind; as *M. Ambivius* and *Mænas Licinius*, as alſo *C. Matius*, whoſe ſtudy it was, by their precepts, to inſtruct and form the diligence of a Baker, and of a Cook, and alſo of a Butler, or Clerk of the Kitchen.

But all theſe authors were of the mind, that it was neceſſary, that he, who undertakes any of theſe offices, ſhould be chaſte and continent, becauſe the whole conſiſted in this, that neither cups, nor victuals, ſhould be handled, but by one under age; or, at leaſt, one that moſt carefully refrained from Venereal affairs, which if either Man or Woman has meddled with, they ought to be waſhed and cleanſed, either in a river, or in conſtantly running water, before ever they touch the proviſions; for which reaſon the ſervice of a boy, or a virgin is neceſſary for theſe things, by whom ſuch things, as there ſhall be occaſion to uſe, may be brought out.

After this precept, they order a place, and proper veſſels, for powdered proviſions, pickles, preſerved fruit, *&c.* to be prepared; and, that the place ought not to be expoſed to the Sun, but the coldeſt and the drieſt that can poſſibly be had, leſt the proviſions contract mouldineſs by the moiſture. But theſe veſſels muſt be either of potters-earth, or of glaſs, rather more in number than large; and ſome of them well pitched; nevertheleſs, others of them muſt be pure without pitch.

Theſe veſſels muſt be made on purpoſe, with a wide mouth, and equal to the very bottom, not ſhaped in the manner of a wine-veſſel, that ſo, when the pickles are taken out for uſe, whatever remains may be preſſed down equally to the bottom, with a weight; for this keeps the proviſions from ſpoiling, when they do not ſwim upon, but are always ſunk under the brine, which can ſcarcely be done in the belly of a wine-veſſel, becauſe of the inequality of its ſhape: it is very neceſſary for this to make uſe of vinegar, and of very ſtrong brine; both which are made after this manner.

CHAP.

CHAP. V.

How Vinegar may be made of flat Wine.

FOR forty-eight *ſextarii* of vapid wine, that it may become acid, bruiſe a pound of leaven, a quarter of a pound of dry figs, a *ſextarius* of ſalt; and, after they are bruiſed with a quarter of a pound of honey, dilute them with vinegar, and ſo put them to the foreſaid quantity: ſome add to the ſame quantity four *ſextarii* of parched barley, and forty burning walnuts, and a pound and an half of green mint: ſome heat maſſes of iron in the fire, till they have the appearance of fire itſelf, and put them into the ſame quantity of wine: ſome alſo, after they have taken out the kernels of five or ſix pine-apples, ſet the empty pine-apples themſelves on fire, and put them down burning into the wine: others do the ſame thing with burning pine-fir-tree-nuts.

CHAP. VI.

How ſtrong Brine or Pickle may be made.

MAKE ſtrong brine after this manner: In that part of the manor-houſe which receives moſt of the Sun, place a barrel or vaſe with a very wide mouth; fill this veſſel with rain-water, for this is the fitteſt water for this buſineſs; or, if you have no rain-water, be ſure that it be ſpring-water of the ſweeteſt taſte: then into this water put a ruſh- or *Spaniſh* broom-baſket, which muſt be filled with white ſalt, that the brine may be the whiter: when you ſhall ſee, that the ſalt continues to melt for ſome days, you ſhall thereby underſtand, that the brine is not as yet ripe.

Therefore you ſhall ſtill put in more ſalt from time to time, till it remain in the baſket intire, without melting, which when you ſhall obſerve, you ſhall know, that the brine is come to its maturity: and, if you have a mind to make other brine in the ſame veſſel, you ſhall pour this into veſſels that are well pitched, and keep it covered in the Sun; for the ſtrength of the Sun takes away all muſtineſs, and gives it a ſweet ſmell. There is another way to try if brine be ripe; for,

when you ſhall have put ſweet cheeſe into it, if it ſink down to the bottom, you ſhall know, that it is not as yet ripe; if it ſwim in it, you ſhall know, that it is ripe.

CHAP. VII.

What Herbs may be pickled throughout the four Seaſons of the Year, and after what Manner.

THESE things being prepared, about the vernal Equinox herbs muſt be gathered, and laid up for uſe, *viz.* ſprouts, colewort or cabbage, capers, the ſmall tender ſtalks of parſley, rue, aliſſander with its ſtalk, before it comes out of its huſe: alſo the tender tops of the ſtalks of fennel-giant before they begin to ſpread, and the tendereſt flower of the wild and garden parſnep, with its ſmall ſtalks; the flower of the white bryony, before it begins to ſpread; and of aſparagus, and butchers-broom, and buckthorn, and of the common great houſleek, penny-royal, and cat-mint, and of wild colewort, and ſamphire, and its ſmall ſtalk, which is called kite's-foot; as alſo the ſmall tender ſtalk of fennel.

All theſe are very ſafely preſerved with one pickling, that is, if you mix two parts of vinegar, and a third part of ſtrong brine: but the white bryony, the butchers-broom, and buckthorn, and aſparagus, wild colewort, and the parſnep, and the cat-mint, and ſamphire are put into trays, according to their kinds; and, when they are ſprinkled with ſalt, they are placed for two days in the ſhade, till they be all in a ſweat: then, if they have thrown out as much moiſture, as that they may be waſhed with their own juice, it is well; if not, they pour ſtrong brine upon them, and waſh them therein, and ſqueeze the liquor out of them by a weight laid upon them; then each of them is put up into its own veſſel, and the liquor, as I ſaid above, which is mixed with two parts vinegar, and one of ſtrong brine, is poured upon them, and a ſtuffing of dry fennel, which was gathered laſt year during the vintage, is put upon them; ſo that it may preſs down the herbs, and that the liquor may come up to the brim of the jar.

When you gather aliſſander, fennel-giant, and fennel, expoſe them within-doors till they grow yellow; then pull the leaves, and all the bark, off the ſtalks: if the cabbages or colliflowers be thicker than the thumb, cut them with a reed, and divide them into two parts: alſo

alſo the flowers themſelves muſt be laid open and divided, that they may not be too large, and ſo put up into veſſels; then the liquor above-mentioned muſt be poured upon them, and a few ſmall roots of laſer, which the *Greeks* call σίλφιον, added to them, and ſo covered with a ſtuffing of dry fennel, that the liquor may come up over them.

Sprouts, cabbage or colliflowers, caper-ſhrub, kite's-foot, penny-royal, the common great houſleek, muſt be dried ſeveral days under the roof, till they grow yellow, and then it is proper they ſhould be pickled in the ſame manner as you did the fennel-giant, rue, ſavory, and wild marjoram. There are ſome who pickle rue with ſtrong brine only, without vinegar; then when they have occaſion to uſe it, they waſh it with water, or even with wine; and, after they have poured oil upon it, make uſe of it. With this pickling green garden ſavory, as alſo green wild marjoram, may be commodiouſly preſerved.

CHAP. VIII.

How Oxygal, or ſour Milk, may be made.

MAKE oxygal, or ſour milk, after this manner: Take a new pot, and bore a hole in it, hard by the bottom; then with a ſprig ſtop up the hole you have made, and fill the veſſel with the freſheſt ewe-milk, and to it add ſmall bundles of green ſeaſoning herbs, origany, mint, onion, coriander: put theſe herbs ſo far down into the milk, that the ſtrings, wherewith they are tied, may appear on the outſide.

After the fifth day, take out the ſprig wherewith you ſtopped the hole, and let out the whey; then, when the milk begins to drop out, ſtop up the hole with the ſame ſprig; and, after three days intermiſſion, let out the whey in the ſame manner as has been already ſaid; and take out the ſmall bundles of ſeaſoning herbs, and throw them away; then rub a little dry thyme, and dry wild marjoram, upon the milk; and add to it as much of a ſective leek, cut very ſmall, as you ſhall think fit, and mix them together: after having ſtayed two days, let out the whey again, and ſtop up the hole, and put as much brayed ſalt to it as ſhall be ſufficient, and mix them; then, having put a cover upon it, and daubed it, you ſhall not open the pot, till you ſhall have occaſion to uſe it.

There are ſome, who, after they have gathered garden or even wild dittander, or pepperwort, dry it in the ſhade; then, having thrown away the ſtalk, they ſteep the leaves a day and a night in ſtrong brine; and, after they have ſqueezed the liquor out of them, they mix them with the milk without the ſeaſoning herbs, and add as much ſalt to it as they think enough: then they do the other things we directed above. Some mix young freſh leaves of dittander with the ſweet milk in the pot, and, after the third day, let out the whey in the manner we have directed: then they find ſome green ſavory, as alſo the dry ſeeds of coriander, dill, thyme, and parſley; and bray them well into one maſs, and add them to it, and mingle the beſt-made and well-ſifted ſalt throughly with it. The other things above-mentioned they do after the ſame manner.

CHAP. IX.

Of Pickling of Lettuce.

HAVING cleanſed the ſtalks of the lettuce from the lower part, as far as where the leaves ſhall ſeem to be tender, you muſt ſalt them in a tray, and let them alone a day and a night, till they have thrown out their brine; then waſh them, and take them out of the brine; and, after they are ſqueezed, ſpread them upon hurdles, till they grow dry; then ſpread dry dill and fennel under them, and cut a little rue and leek, and ſo mix them together: then, when the little ſtalks are dried, you muſt put them up in ſuch a manner, that green kidney-beans intire may be placed among them, the which you muſt ſteep a day and a night before in ſtrong brine; and, after they are dried in the like manner, they muſt be put up with the bundles of lettuce, and a liquor made of two parts of vinegar, and one of ſtrong brine poured upon them: then they muſt be ſo preſſed down with a ſtuffing of dry fennel, that the liquor may ſwim above them.

That this may be done effectually, he that has the direction and management of this affair, ought frequently to pour liquor upon them, and not ſuffer the pickles to grow dry, but wipe the outſide of the veſſels with a clean ſponge, and cool them with the freſheſt ſpring-water. After the ſame manner you muſt pickle endive, and the tops of the blackberry-buſh, as you do lettuce; as alſo of thyme, and ſavory, and wild marjoram, and the ſprouts of wild radiſhes: but theſe things above-mentioned are made up and pickled in the Spring.

CHAP.

CHAP. X.

Of preſerving of Onions, Pears, and Apples, and all Fruits of the Apple-kind.

NOW we ſhall give directions concerning ſuch things as ought to be gathered and laid up in Summer, about the time of harveſt, and alſo after the harveſt is over: Chooſe the *Aſcalonian* or *Pompeian* onion, or the ſingle *Marſian* alſo, which Ruſtics call *unio*; and it is that which has not put forth any ſprouts or ſhoots, and has not had any offspring or young ones adhering to it (1).

Dry this firſt in the Sun, and then, having cooled it in the ſhade, put it up in a jar, having ſpread thyme, or ſavory, or wild marjoram, under it; and, having poured a liquor upon it, conſiſting of three parts vinegar, and one of ſtrong brine, put a ſmall bundle of ſavory or wild marjoram upon it, ſo that the onion may be depreſſed; and when it has drunk up the liquor, let the veſſel be filled up again with the like mixture. At the ſame time the fruit of the cornel-tree or cornel-berries, and onyx-coloured plums, and wild plums, bullaces or ſloes; as alſo the ſeveral kinds of pears and apples, are preſerved.

The fruit of the cornel-tree, or cornel-berries, which we may uſe inſtead of olives, alſo wild plumbs, or bullaces, or ſloes, and onyx-coloured plumbs, muſt be gathered while they are yet firm and ſolid, and not when they are very ripe, nor yet muſt they be too green; then they muſt be dried one day in the ſhade; then let vinegar, and muſt boiled into one half or one third of the firſt quantity, be mixed together in equal quantities, and poured upon them. But you muſt add ſome ſalt to them, leſt maggots, or any other animals, breed in them: but they will keep better, if two parts of ſweet muſt, boiled into one half of the firſt quantity, be mixed with one part vinegar.

After you have gathered the *Dolabellian*, the *Cruſtuminian*, the royal and *Venus* pears, the warden pears, the *Nævian*, the brick-coloured pears, the huge fair pear, the laurel and muſk pears, and the purple plums, before they are throughly ripe, nevertheleſs not very

(1) It has been already obſerved, that the *Aſcalonian* onion had its name from *Aſcalonia*, a city in *Judea*, and is, as ſome think, what we call *ſhalot*, and the *French eſchalotes* The *Pompeian* has its name from *Pompeii*, a town in the kingdom of *Naples*, mentioned in the tenth book. The *Marſian* was originally from the *Marſi*, a people formerly inhabiting a part of the kingdom of *Naples*; the author himſelf mentions its diſtinguiſhing character.

green, examine them carefully, and ſee that they be ſound, without any blemiſh, or little worms in them; then put them up in a pitched earthen jar, and fill it either with raiſin wine, or with muſt boiled in to a third of the firſt quantity, ſo that all the apples may be below the liquor; and, after you have put the cover upon it, plaſter it.

I thought it neceſſary to give you this direction upon the whole, that there is no kind of apple, which may not be preſerved in honey: therefore, ſince this thing is very ſalutary to ſuch as are ſick, I am of opinion, that a few apples, at leaſt, ſhould be preſerved in honey, but kept ſeparate according to their kinds; for, if you mix them together, one kind is corrupted by the other. And, ſeeing we have very opportunely made mention of honey, at this ſame time the bee-hives muſt be caſtrated, and the honey and the wax made: of which we have already ſpoken in the ninth book. Nor do we now require, that the Houſe-keeper, the Bailiff's Wife, ſhould take any other care upon her in this matter; but, that ſhe be preſent with them that have the management of this affair, and take the fruit into her cuſtody.

CHAP. XI.

Of the Compoſition of a ſweet Water, which they uſe for the preſerving of Fruit, &c.

BUT foraſmuch as, at the ſame time, bees-wax-water (1), as alſo mead, ought to be laid up, in order to be kept till they grow old; you muſt remember, that, when you have received the ſecondary honey from the honey-combs, the wax be preſently ſeparated and broken into very ſmall pieces, and ſteeped in ſpring- or rain-water; and, after the water is ſqueezed out, let it be ſtrained, and poured into a leaden veſſel, and boiled, and let all the filth and naſtineſs be taken off it with the ſcum: after it is boiled, when it is as thick as muſt ſodden in to a third part of its firſt quantity, let it be cooled, and put up in ſtone bottles well pitched.

Some uſe this bees-wax- or honey-water inſtead of mead; ſome alſo make uſe of it, inſtead of muſt ſodden in to a third of the firſt

(1) *Mella.* This feminine ſubſtantive, though twice mentioned in this chapter, and alſo *cap.* 47. is not to be found in ſeveral Dictionaries: it is a liquor made with water, and the freſh bees-wax ſteeped in it for a certain time, and afterwards boiled, as here directed.

quantity,

quantity, for preſerving of olives; for which, indeed, I think it is more proper, becauſe it gives a reliſh, and is ſavory for eating: and it cannot be a remedy, inſtead of mead, to ſuch as are in a languiſhing condition; becauſe, if they drink it, it cauſes an inflation of the ſtomach, and the bowels.

CHAP. XII.

Of the Way to make Mead.

THerefore having ſet apart this bees-wax-water, and deſtinated it for preſerving of fruits, mead muſt be made by itſelf of the very beſt honey; but it is not made after one manner: for ſome, many years before, put up rain-water in veſſels, and ſet it in the Sun in the open air; then, having emptied it from one veſſel to another, and made it very clear, (for, as often as it is poured from one veſſel to another, even for a long time, there is found, in the bottom of the veſſel, ſome thick ſettling like dregs) they mix a *ſextarius* of old water with a pound of honey.

Nevertheleſs ſome, when they have a mind to make the mead of a rougher taſte, mingle a *ſextarius* of water with three quarters of a pound of honey; and after they have, according to this proportion, filled a ſtone bottle, and plaiſtered it, they ſuffer it to be forty days in the Sun, during the riſing of the Dog-ſtar; then they put it up in a loft, which receives ſmoak. Some, who have not been at the pains to preſerve rain-water till it becomes old, take that which is freſh, and boil it in to a fourth part: then, after it is grown cold, if either they have a mind to make mead ſweeter than ordinary, they mix a *ſextarius* of honey with two *ſextarii* of water; or, if they would have it rougher, they put three quarters of a pound of honey to a *ſextarius* of water; and, having made it according to theſe proportions, they pour it into a ſtone bottle; and, after they have kept it forty days in the Sun, as I ſaid above, they put it up in a loft, which receives ſmoak from below.

CHAP. XIII.

Of preſerving Cheeſe, and pickling certain Herbs.

THIS is the fitteſt time for preparing cheeſe for domeſtic uſes, when both the cheeſe ſends forth, or throws out, the leaſt whey; and in the latter ſeaſon, now when there is but little milk, it is not ſo expedient to take up the Labourers time in carrying the fruits to the market: and, indeed, when they are carried to market during the Summer, they often ſpoil by turning ſour; therefore it is better to make them up for uſe at this very time. And it belongs to the office of a Shepherd, to ſee that it be as well done as poſſible; to whom we gave directions in the ſeventh book, which he ought to follow.

There are alſo certain herbs, which you may pickle when the vintage approaches; as *purſlain*, and that *latewaard potherb*, which ſome call *garden ſamphire*. Theſe herbs are carefully cleanſed, and ſpread in the ſhade; then, on the fourth day, they ſpread ſalt in the bottoms of jars, and each of the herbs is put up apart by itſelf; and, after they have poured vinegar into the veſſels, they again put ſalt over the herbs; for ſtrong brine is not proper for theſe herbs.

CHAP. XIV.

Of drying Apples and Pears in the Sun.

AT this ſame time, or even in the beginning of the month of *Auguſt*, they pick out apples and pears of the ſweeteſt taſte, and middling ripe; and, when they have divided them into two or three parts, with a reed or a bone-knife, they lay them in the Sun, till they grow dry. If there be great plenty of them, the Peaſants preſerve them as not the leaſt part of their food during Winter; for they are inſtead of dainties to them, as figs, which, when they are laid up dry, contribute greatly to the ſuſtenance of country-people during the Winter-time.

CHAP.

CHAP. XV.

Of dry Figs.

THESE ought to be gathered when they are neither too ripe, nor too green, and ſpread abroad in a place which may receive the Sun: and they faſten ſtakes at the diſtance of four feet from each other, and couple them together with poles laid acroſs them. Then upon theſe frames they place canes made for this uſe, ſo that they may be at the diſtance of two feet from the earth, leſt they attract the moiſture, which the ground commonly ſends forth in the night: then they throw the figs upon them; and on each ſide they place, flat upon the ground, Shepherds hurdles, woven either with haulm, or ſedge, or fern, that ſo, when the Sun is near ſetting, they may be erected, and, being placed leaning towards each other, may, with their arched roof, in the manner of a ſhed or lodge, defends the figs, which begin to grow dry, from the dew, and ſometimes from the rain; for both theſe ſpoil the foreſaid fruit.

Then, after the figs are dried, about the middle of the day, while they are warm, you muſt put them in jars that are well pitched, and tread them down carefully: nevertheleſs dry fennel muſt be laid under them, and then put over them, when the veſſels are filled: which veſſels it is proper forthwith to put covers upon, and to daub them over, and lay them up in the drieſt ſtore-houſe you have, that the figs may keep the better all the year long.

Some, after they have gathered the figs, take away their pedicles or ſtalks, and ſpread them in the Sun; then, after they are dried a little, before they begin to grow hard, they gather them together into earthen or ſtone veſſels; then with their waſhed feet they tread them down as they do meal, and mix with them parched ſeſamum, with *Egyptian* aniſe, and fennel- and cumin-ſeeds.

When they have trodden theſe well together, and mixed the whole maſs of the bruiſed figs throughly, they wrap up ſmall lumps of it in fig-tree-leaves; and, having tied the lumps with a ruſh, or any other herb, they lay them upon hurdles, and ſuffer them to dry: then, when they are throughly dried, they put them up in pitched veſſels. Some put up figs, in this very form, in tubs and jars without pitch; and, having daubed the veſſels, they toaſt them either in a ſmall moveable, or great oven, that all the moiſture may be dried up

the more ſpeedily: after they are dried, they lay them up in a loft; and, when they have occaſion to uſe them, they break the earthen veſſel; for otherwiſe they cannot take out the hardened maſs of figs.

Others pick out all the fatteſt of the green figs, and, having divided them, either with a reed or with their fingers, dilate them, and ſo ſuffer them to grow dry in the Sun: then, when they are well dried with the warmth of the middle of the day, and when they are ſoftened with the heat of the Sun, they gather them together: and, as it is the cuſtom with the *Africans* and *Spaniards*, after they have put them into a certain regular poſition with one another, they ſqueeze them, and reduce them into the figures of ſtars, and ſmall flowers, or into the form of bread; then they dry them again in the Sun, and ſo put them up in veſſels.

CHAP. XVI.

Of making dried Raiſins, or Raiſins of the Sun, and preſerving Sorb-apples.

GRAPES require the like care as *figs:* When the weather is fair and dry, in the decline of the Moon, after the fifth hour of the day, you muſt gather ſuch of them as are white, of the ſweeteſt taſte, with the largeſt grains, not too thick and cloſe upon one another; and ſpread them for a little while upon boards, leſt, being laid cloſe upon one another, they be bruiſed with their own weight: then, having prepared beforehand a lixivium of the aſhes of vine-ſprays, it is proper, that it be warmed in a kettle, or in a new large earthen pot; and, when it boils, that a little of the very beſt oil be added to it, and ſo mixed throughly together; then, that the grapes, two or three cluſters of them being tied together, according to their bigneſs, be put into the boiling kettle, and kept in it a little while, till they be diſcoloured: nor muſt you again ſuffer them to boil throughly; for here a certain moderation and temperament is neceſſary. Then, when you ſhall have taken them out, lay them in order upon an hurdle, and at ſuch a diſtance, as not to touch one another: then, after three hours, turn each bunch, and do not lay it again in the ſame place where it lay before, leſt it be ſpoiled by the moiſture which runs from it. But, in the night-time, they ought to be covered in the ſame

ſame manner as figs, that they may be defended from the dew, or the rain: then, after they are moderately dried, put them into new veſſels, with covers upon them, without any pitch, but plaiſtered; and lay them up in a dry place.

Some wrap up grapes to be dried in the Sun in fig-leaves, and ſo dry them; others cover the half-withered grapes with vine- or plane-tree-leaves, and ſo put them up in amphors. There are ſome who burn the ſtalks of beans, and of the aſhes thereof make a lixivium; then to three *ſextarii* of the lixivium they add ten *cyathi* of ſalt, and one *cyathus* of oil; then they ſet it on the fire, and warm it, and ſo perform the other things in the ſame manner as before. But if it ſhall appear, that there is but little oil in the kettle, let as much be added, from time to time, as ſhall be ſufficient, that ſo the raiſins may be the brighter and the fatter.

At the ſame time gather and pick out the beſt ſervice-apples, and put them carefully into little pots, and put pitched covers upon them, and daub them with plaſter; then after you have made trenches or pits, two feet deep, within the houſe, place the little pots together therein, ſo that their mouths, which are daubed over with plaſter, may look downward: then gather the earth together, and tread it down ſoftly upon them. But it is better to place fewer veſſels, at a diſtance from each other, in ſeveral pits; for in taking them out, while you are taking away one, if you move the reſt, the ſorb-apples will quickly ſpoil. Some alſo preſerve this ſame apple very well in muſt, boiled into one third of the firſt quantity, putting a ſtuffing of dry fennel upon them, that thereby the ſervice-apples may be ſo preſſed down, that the liquor may always ſwim above them; and notwithſtanding this, they carefully daub the pitched covers with plaſter, that no air may be able to get in.

CHAP. XVII.

Of making Vinegar of Figs.

THERE are certain countries, wherein there is a ſcarcity of wine, and conſequently of vinegar alſo: therefore at this ſame time, the freſheſt figs muſt be gathered as ripe as poſſible; yea, even tho' the rains be now come on, and they be fallen upon the ground by reaſon of the ſhowers; which, when they are picked up, are put

into firkins or barrels, and there left to ferment: then, when they have thrown out their juice, and it is grown acid, whatever vinegar they have yielded is carefully ſtrained, and poured into pitched veſſels that have a good ſmell. This will be as good for uſe, as the ſharpeſt vinegar of the firſt note; and will never contract any bad ſmell, or grow muſty, if it is not put in a moiſt place.

There are ſome, who, having regard to the quantity, mix water with the figs, and add to them the ripeſt freſh figs from time to time, and ſuffer them to conſume and diſſolve in that liquor, till it have the taſte of ſharp-enough vinegar: afterwards they ſtrain it through a ruſh-frail, or a bag made of *Spaniſh* broom; then, when the vinegar is clear, they boil it till they take away the ſcum, and all the filth and naſtineſs from it; then they add a little toaſted ſalt to it, which hinders little worms and other animals to breed in it.

CHAP. XVIII.

Of ſuch Things as muſt be prepared for the Vintage (1).

ALthough, in the preceding book, which is intituled the *Bailiff*, we have already told what things muſt be prepared for the vintage; nevertheleſs, it will not be improper to give directions, to the Bailiff's Wife, concerning the ſame things, that ſhe may underſtand, that whatever things, relating to the vintage, are tranſacted within-doors, ought to be under her inſpection and care.

If the ground is of a large extent, or if the vineyards, and the plantations of trees for the ſupporting of vines, be large, veſſels, containing three *modii* and ten *modii*, muſt be made year after year, and

(1) It may be neceſſary here to obſerve, that *dolium*, *feria*, and *cadus*, denote no certain determinate meaſure; theſe veſſels were of different ſizes, ſome larger, ſome ſmaller. In this chapter there is mention made of a *dolium ſeſquiculeare*, *i. e.* of a *culeus* and an half, which contained 214 gallons, 7 pints, and a little more; which, I reckon, was one of their largeſt ſort which they fixed in the ground. And, in the xxviiith chapter of this book, we read of a *feria* of 7 *amphoræ*, which make about 57 gallons; and he makes mention there of a *cadus* which contained two *urnæ*, which make 7 gallons and one pint, and a little more. All theſe different veſſels cannot well be tranſlated by any *Engliſh* words exactly anſwering, moſt part of modern wine-veſſels being intirely different from thoſe in uſe among the antient *Romans*; and, being for ſeveral ages made moſtly of earth, they were, both in their ſhape and capacity, very different from ours: though afterwards they were made of wood in many places, eſpecially near the *Alps*, which probably at firſt differed very little from the others, except in the ſtuff they were made of.

ſmall

ſmall baſkets muſt be woven and pitched; as alſo ſmall ſickles or bills, and iron-hooks in great number muſt be prepared, and well whetted, leſt the Grape-gatherer ſtrip off the bunches of grapes with his hand, and no ſmall part of the fruit ſlip out of his hands, and be loſt, by ſcattering the berries upon the ground.

Small cords muſt be fitted to the little baſkets, and leather-ſtrops to the veſſels that contain three *modii*; alſo the wine-vat, and the preſſes, and the places where the grapes are preſſed, and all the veſſels, muſt be throughly waſhed with ſea-water, if the ſea be near at hand; if not, they muſt be waſhed with freſh water, and carefully cleanſed and dried, leſt they contain any moiſture. The wine-cellar alſo muſt be cleared from all dung and dirt, and perfumed with good odours, that it may not ſend forth any ſtinking ſavour, or have any ſour ſmell.

Then ſacrifices muſt be offered, with the greateſt ſanctimony and purity, to *Liber* and *Libera* (2), and to the veſſels belonging to the wine-preſs: nor muſt the Bailiff's Wife depart from the wine-preſs, or the wine-cellar, during the vintage, that they who manage and prepare the muſt, may do all things in a clean and neat manner; and that no opportunity may be given to a thief to lay hands on, and intercept the fruit that is there.

The hogſheads alſo, and buts, and other veſſels, muſt be pitched forty days before the beginning of the vintage; and ſuch of them as are ſunk into the ground, muſt be done after one manner; and thoſe that ſtand above-ground, after another: for thoſe that are ſunk into the ground, are heated with burning iron-lamps; and the lamp, when it has diſtilled the pitch into the bottom of the veſſel, being removed, the pitch, which has diſtilled to the bottom, or has ſtuck to the ſides, is ſpread with a ſkealing-ſtick, and a crooked iron-ſcraper; then it is wiped with a mop, and, after exceeding hot boiling pitch is poured

(2) *Libero Liberæque.* It is not very certain whether the author here, by *Liber*, means *Bacchus*, who, indeed, is frequently called by this name; becauſe, as ſome ſay, wine chears the mind, and frees it from anxiety and care: but the difficulty is to tell, who this *Libera* was: *Cicero*, *de Natura Deorum*, mentions one *Liber* different from *Bacchus*, who, with *Libera* and *Ceres*, were religiouſly worſhipped by the *Romans*. Some by *Ceres* mean the Earth, and by *Liber* and *Libera* the Sun and the Moon: and, both in *Livy* and *Tacitus*, there is mention made of a temple dedicated to *Ceres*, *Liber*, and *Libera*: their ſacrificing to theſe was common enough; but their paying any ſuch reſpect to the veſſels they made uſe of in preſſing their grapes, *&c.* is not ſo evident. Perhaps the text is corrupted here, as in ſome other places, and it ought to be read, as the learned *Geſnerus* conjectures, *e vaſis preſſoriis*; and ſo the meaning will be, that they uſed theſe veſſels, at that time, in the ſacrifices they offered when they began their vintage, in order to purify and conſecrate them.

into it, the pitch is ſpread over it with another new ſkealing-ſtick, and a ſmall beſome.

But ſuch veſſels as ſtand above-ground, are brought out to the Sun ſeveral days before they are cured; then, when they have been long enough expoſed to the Sun, they are turned upon their brims, and ſuſpended upon three ſmall ſtones put under them; and ſo a fire is put under them, and kept ſo long burning, till ſuch a vehement heat comes up to the bottom of the veſſel, that the hand, when it is applied to it, cannot endure it; then the hogſhead being ſet down upon the ground, and laid upon its ſide, the hotteſt boiling pitch is poured into it, and it is rolled up and down, that all the parts of the hogſhead may be daubed with it.

But theſe things ought to be done in a calm day, when there is no wind, leſt the veſſels ſhould burſt by putting the fire to them, when the wind blows upon them. But twenty-five pound-weight of hard pitch, is enough for pipes that contain a *culeus and an half:* nor is there any doubt, but if a fifth part of *Brutian* pitch (3) be added to the whole quantity that is boiled, it will be of very great advantage to all the vintage.

CHAP. XIX.

Of ſeveral Compoſitions for preſerving and ſtrengthening Wine.

CARE alſo muſt be taken, that the muſt, which is ſqueezed out of the grapes, may keep for a long time, or, at leaſt, that it be durable till it be ſold: after what manner this ought to be done, and with what compoſitions it may be benefited and preſerved, we ſhall next ſet before you. Of the muſt which they have thrown into

(3) *Pix Brutia. Pliny* tells us, that liquid pitch, which, no doubt, is what we call *tar*, was obtained from the pine-tree, and fir-trees of ſeveral ſorts, by cutting them into billets, and ranging them into piles, and ſurrounding them with furnaces, the heat of which made the wood exſude the moiſture it contained: the firſt running of this liquor they called *liquid pitch:* the ſecond running was thicker, and was properly what they called *pitch*; this being thrown into caldrons, and boiled to a certain degree, when it was coagulated, took the name of *Brutian pitch:* it was more viſcous and glutinous than that other pitch, and of a bright-ſhining reddiſh colour; and, when the greateſt part of its moiſture was exhaled by the heat, it was called *dry pitch*; and, becauſe it was at firſt made by the *Brutii*, a people in *Calabria*, or, at leaſt, in the greateſt perfection, they therefore called it *Brutian pitch.*

leaden

leaden veſſels, ſome boil away a fourth part of it, others a third: nor is there any doubt, but, if any ſhould boil it to one half, he would make a better rob of grapes, and ſo much the more profitable for uſe, inſomuch, indeed, that, inſtead of muſt boiled in to one third of the firſt quantity, this *muſt*, boiled away into one half, may ſuffice to preſerve the muſt which is the produce of old vineyards.

Whatever character the wine may be of, which can be kept for years, without any compoſition or mixture to preſerve it, we are of opinion that is the beſt; nor muſt any thing at all be mixed with it, whereby its natural taſte may be blunted or allayed; for that, which can pleaſe by its own natural quality alone, is the moſt excellent. But when, either through the fault of the country, or of new vineyards, the muſt labours under any defect, we muſt make choice of a part of an *Aminean* vineyard (if we have any in our poſſeſſion); if we have none, then we muſt make choice of a vineyard, which produces the neateſt and the moſt agreeable wine; and which is neither very antient, nor yet wet and marſhy.

Then we muſt obſerve when the Moon is decreaſing, and when ſhe is under the Earth; and, in a clear and dry day, we muſt gather the very ripeſt grapes, which, being trodden out, we muſt carry from the vat to the veſſels wherein we make the rob of grapes, as much of the muſt which has flowed from the grapes before the ſtalks and huſks are preſſed, as we ſhall have occaſion for; and we muſt heat the furnace, at firſt, with a gentle fire, and with very ſmall pieces of wood, ſuch as the Peaſants call bruſh-wood, that ſo the muſt may boil at leiſure.

And let him, who has the charge of boiling it, have ready prepared beforehand ruſh- or *Spaniſh* broom-ſtrainers, made of raw *Spaniſh* broom, that is, which has not been beetled; as alſo bundles of fennel tied to clubs, which he may put down to the very bottom of the veſſels, that he may ſtir up whatever part of the dregs ſhall have ſubſided, and bring them to the top; then let him take away, with the ſtrainers, all the filth that riſes up, and ſwims upon the top in great abundance: nor let him deſiſt from doing this, till the muſt appear clear and free from all manner of dregs: then let him either put quinces into it, which he muſt take away when they are throughly boiled, or any other agreeable and ſuitable odours he ſhall think proper. Nevertheleſs, let him ſtir it up throughly, from time to time, with the fennel, leſt any thing ſubſide which may perforate the leaden veſſel.

But

But now, when the veſſel ſhall be able to bear a fiercer fire, that is, when the muſt, being in ſome part boiled away, ſhall now ſeeth into itſelf, then let ſtumps of trees, and larger wood, be put under it, but ſo as not to touch the bottom of it; for, unleſs this be avoided, either the veſſel itſelf, which ſometimes happens, will be pierced through; or if this is not done, the muſt will certainly be burnt-to, and, having contracted a bitterneſs, will be unfit to be uſed as a preſerve for any thing: but, before the muſt is thrown into the veſſels for boiling it in to a certain quantity, it is neceſſary, that ſuch of them as are made of lead, be ſoaked and anointed with good oil in the inſide, and well rubbed, and ſo the muſt put into them: this thing hinders the ſodden muſt to be burnt-to.

CHAP. XX.

Of boiling Muſt into one half, or into one third of the firſt Quantity.

BUT even the rob of grapes alſo, or the ſweet muſt, ſodden into one third of the firſt quantity, though carefully made, uſes to grow ſour in the ſame manner as wine; and ſince it is ſo, we muſt remember to preſerve our wine with muſt, ſodden into a third part of a year old, the goodneſs of which we have already had ſufficient proof of; for the fruit which we have gathered is corrupted, and ſpoiled with a bad medicament. But the veſſels themſelves, wherein the muſt, which is to be reduced into one half, or one third of the firſt quantity, is boiled, ought rather to be of lead than of braſs; for, in the boiling, the brazen veſſels throw out a ruſt, and corrupt the taſte of the medicament.

The odours which are commonly proper for wine, and are boiled with the ſodden muſt, are the *flower-de-luce*, *fenugreek*, *ſweet ruſh*: one pound weight of each of theſe things ought to be put into a muſt-caldron, which has received ninety *amphoræ* of muſt, juſt after it has left off boiling, and is cleared from all its filth. Then, if the muſt be of its own nature ſmall, when it is boiled away to a third part, the fire muſt be withdrawn from it, and the furnace muſt be forthwith cooled with water: which tho' we have done, nevertheleſs the ſodden muſt ſinks below the third part of the veſſel. But, tho' this may be of ſome detriment, yet it has its advantage; for, the more it is

boiled away, (provided it be not burnt-to) the better and thicker it will be.

But, of this muſt, boiled after this manner into a third part of the firſt quantity, it will be ſufficient to mix one *ſextarius* with one *amphora* of wine: for, when you have boiled ninety *amphoræ* of muſt in a muſt-caldron, ſo that there is but a little over and above the quantity to which it is to be boiled, (that is to ſay, a third part of the firſt quantity) then, and not before, add the medicaments to it, which may be either liquid or reſinous; that is, ten *ſextarii* of liquid *Nemeturican* pitch or tar (1), when you have firſt carefully waſhed it with boiled ſea-water; alſo a pound and an half of turpentine reſin.

When you ſhall have added theſe things to it, you ſhall ſhake and ſtir the leaden veſſel throughly, that they may not burn-to: then, when the boiling liquor is ſunk down to a third part, withdraw the fire; and you muſt ſtir the leaden veſſel from time to time, that the ſodden muſt and the medicaments may mix together: then, when the muſt, boiled into a third part of its firſt quantity, ſhall ſeem tolerably warm, you ſhall, by little and little, ſprinkle the reſt of the ſpices into it, after they are bruiſed and ſifted; and you ſhall order what you have boiled to be ſtirred with a wooden ladle, till ſuch time as it grows cold: but, if you do not throughly mix it, as we direct, the ſpices will ſubſide, and burn-to.

But, to the foreſaid quantity of muſt thoſe odours ought to be added, the leaf of *ſpikenard*, the *Illyrian Iris* or *flower-de-luce* (2), *Gallican ſpikenard*, *dates*, *coſtum* (3), *cyperus* (4), *ſweet ruſh*; of which half a pound each will ſuffice: alſo five ounces of *myrrh*, a pound-weight of *calamus*, half a pound of *caſia*, a quarter of a pound of *amomum*, five ounces of *ſaffron*, a pound of *melilot*.

Theſe, as I ſaid, dry, bruiſed, and ſifted, ought to be added to it; and with them a certain quantity of crude pitch ought to be mixed: and the older that is, ſo much the better it is reckoned; for, becoming harder by long keeping, when it is bruiſed, it is reduced into powder, and mixed with theſe medicaments: but it is ſufficient, that

(1) *Nemeturicæ picis liquidæ*. *Pliny* mentions the *Nemeturi* among the people inhabiting the *Alps*: probably they made a ſort of liquid pitch or tar, which was reckoned beſt for preſerving wine; and it had its name from the people who made it; as the *Brutian*, *Narycian*, &c.

(2) *Iris Illyrica*, the *Illyrian* flower-de-luce: the beſt ſort of it grew in the inland parts of *Illyrium*, from which country it has its name.

(3) *Coſtus*, or *coſtum*, as our author has it, is an *Indian* ſhrub, greatly eſteemed for its root, which has a moſt fragrant ſmell; ſo that they called it commonly, by way of eminence, *radix*, *the root*, as they did the leaf of ſpikenard *folium*, the leaf.

(4) *Cyperus*, an angular ruſh of an agreeable ſmell, like ſpikenard.

ſix pounds of this be mixed with the foreſaid quantities. It is uncertain, how much of this compoſition muſt be put to forty-eight *ſextarii* of muſt; becauſe, according to the nature of the wine, an eſtimation muſt be made, how much may be enough: and we muſt take care, that the taſte of the medicaments, uſed for preſerves, be not felt; for that will drive away the buyer.

Nevertheleſs, if the vintage be wet, I uſually mix four ounces of this medicament; if dry, three ounces of it, with two *amphoræ* of muſt [ſo that the quantity of *muſt* be four *urns*, and the *urna* contain twenty-four *ſextarii*]. I know, that ſome Huſbandmen have put three ounces of the medicament into each *amphora*; but that they were forced to do this, becauſe of the too great weakneſs of this ſort of wine, which ſcarcely continued ſound for thirty days.

Nevertheleſs, if there be plenty of wood, it is better to boil this muſt, and to purge all the ſcum and dregs out of it; by doing which a tenth part of it will waſte, but the reſt will keep long: but, if there be a ſcarcity of wood, you muſt mix an ounce of what they call the flower of marble, or of bruiſed ſtone, for plaſter; as alſo two *ſextarii* of rob of grapes, or muſt ſodden in to a third part of the firſt quantity, with each *amphora* of the wine: this thing, tho' it does not make the wine altogether durable, yet it preſerves the taſte of it till another vintage.

CHAP. XXI.

Of Rob of Grapes, or Muſt boiled in to a third Part of its firſt Quantity, put to Wine to preſerve it till it become old.

LET muſt, of the very ſweeteſt taſte, be boiled in to a third part of its firſt quantity; and, after it is boiled in, as I ſaid above, it is called *defrutum*, (*rob of grapes, or muſt ſodden in to a third part*) which, when it is grown cold, is decanted into veſſels, and laid up, that after a year it may be made uſe of; nevertheleſs, it may alſo be put into wine nine days after it is cooled: but it is better, if it reſt a year. A *ſextarius* of this ſodden muſt is put into two *urns* of muſt, if the muſt be of hilly vineyards; but if of champagne vineyards, they put three *heminæ* to it.

But

But, when the muſt is taken out of the vat, we ſuffer it to leave off fermenting for two days, and to grow cool, and be purged: on the third day, we add to it the rob of grapes (*i. e.* muſt ſodden in to a third part); then, after the ſpace of two days, when that muſt has, in like manner, left off fermenting with the rob of grapes, and is cooled, we purge it, and ſo throw into it an heaped *ligula* (1) of toaſted and bruiſed ſalt, or ſuch a quantity as is a very large 24th part of a *ſextarius*. But they throw the whiteſt ſalt they can find into an earthen pot without pitch; which pot, after it has received the ſalt, they carefully daub with clay mixed with ſtraw, and ſo put it to the fire, and then keep it as long toaſting, as the ſalt makes a noiſe, and cracks: when it has begun to be ſilent, they leave off toaſting it.

Moreover, they ſteep fenugreek in old wine for the ſpace of three days; then they take it out, and dry it in an oven, or in the Sun; and, when it is dried, they grind it; and of this, when it is ground, after the muſt has been ſalted, they put an heaped ſpoonful, or ſuch a kind of cupful or *meaſure*, as is the fourth part of a *cyathus*, into two *urns* of it. Then, when the muſt has intirely left off fermenting, and has ſtood ſtill, we mix as great a quantity of the flour of calcined ſtone with it, as we had put ſalt into it: and ſo, the day following, we purge the wine-veſſel, and cover up the wine we have preſerved, and daub it all over.

My uncle *Columella*, an illuſtrious Huſbandman, was wont to uſe this ſort of preſerve, in thoſe lands wherein he had marſhy vineyards; but the ſame illuſtrious perſon, when he preſerved wines that grew on hills, inſtead of ſalt, put ſalt-water, boiled into one third of the firſt quantity, to them: this, indeed, without doubt, makes it meaſure more, and of a better flavour; but it is attended with danger, leſt the wine be vitiated, if the water be ill boiled. But this water, as I have already ſaid, is taken up as far from the ſhore as can be conveniently done; for the further from ſhore, and the deeper the ſea is from whence it is drawn, the clearer and the purer it is.

If any one ſhall lay it up, and keep it, (as *Columella* did) after the ſpace of three years, when it is ſtrained, and perfectly clear, let him

(1) *Ligula* at firſt ſignified a ſpoon, but afterwards it was uſed as a meaſure, and, I believe, the ſmalleſt in uſe among the *Romans*, at leaſt mentioned by our author; it was moſtly uſed for liquids, but here it is put for a dry meaſure: and *Columella* makes an heaped *ligula* equal to a *ſemuncia bene plena*; by which, I think, he means not the half of an ounce in weight, but the 24th part of the *ſextarius*, which was a meaſure of dry things as well as of liquid, and was divided in the ſame manner as the *as*, and its diviſions had the ſame names, and it is tranſlated accordingly: however, I believe there is no great difference between a pound-weight, and a *ſextarius* full of ſalt.

pour it into other veſſels; then, after other three years, let him boil it into a third part: thus he will have a much better preſerve for his wine, nor will his wines be in any danger of ſpoiling. But it is enough to put one *ſextarius* of ſalt-water to every two *urns* of muſt; altho' many alſo mix two *ſextarii* with that quantity, and ſome three alſo: and I would not refuſe to do this, if the kind of wine has ſo much ſtrength, as the taſte of the ſalt-water may not be felt.

Therefore a diligent Maſter of a family, when he has purchaſed and prepared his ground, will, the firſt vintage, preſently make trial of three or four different ſort of preſerves upon as many *amphors* of muſt, that he may have a full proof, how much ſalt-water the wine, which he has made, will be able to bear, without hurting the taſte of it.

CHAP. XXII.

Another Medicament of liquid Pitch (or Tar) wherewith you may preſerve Wine.

PUT a firkin of liquid *Nemeturian* pitch into a tub or trough, and pour into the ſame two *congii* of a lixivium of aſhes; then mix them throughly with a wooden ſpatula: when it is ſettled, ſtrain off the lixivium; then put a ſecond time the ſame quantity of lixivium to it; mix it throughly, and ſtrain it off after the ſame manner: do the ſame thing a third time alſo; for the aſhes take away the ſmell of the pitch, and waſh the filth out of it. Afterwards, add to the ſame five pounds of *Brutian* pitch; or, if you have not that, of ſome other pitch, the cleaneſt you can find; theſe divide into ſmall pieces, and mix them with the *Nemeturian* pitch: then put into it two *congii* of the very oldeſt ſea-water, if you have any; if not, two *congii* of ſea-water, newly taken out of the ſea, boiled in to a third part of the firſt quantity. Let the tub ſtand uncovered in the Sun, during the riſing of the Dog-ſtar; and mix it very often with the wooden ſpatula, till ſuch time as the things you ſhall have put into it diſſolve in the pitch, and incorporate with it.

But it will be proper to cover the tub in the night-time, leſt the dew fall into it: then, when it ſhall appear, that the ſea-water, which you have put into it, is conſumed by the Sun, you muſt take care to carry the veſſel into the houſe. Some are wont to mix a quarter of

of a pound of this medicament with XLVIII *ſextarii* of wine, and to content themſelves with preſerving it after this manner. Others put three *cyathi* of it into as many *ſextarii* as we have above-mentioned.

CHAP. XXIII.

Of Pitch which the Savoyards *uſe for preſerving of pitched Wine.*

THE pitch, which the *Savoyards* uſe for preſerving their wines, is called *barky* or *ſcaly pitch:* it is ſo made as to be hard; and the older it is, ſo much the better it is for uſe; for, having loſt all its toughneſs, it is the more eaſily reduced into powder, and ſifted. Therefore this pitch muſt be bruiſed and ſifted; then, when the muſt has twice left off fermenting, which, for the moſt part, is within the fourth day from the time it is taken out of the vat which is under the wine-preſs, they carefully cleanſe it from filth with their hands; and then put two ounces and an half of the foreſaid pitch into fifty-five *ſextarii* of it, and mix it throughly with a wooden ladle: nor do they afterwards touch it, till it ferment together; which, nevertheleſs, muſt not be ſuffered more than fourteen days, from the time that the preſerve has been put into it: for, after this number of days, you muſt preſently cleanſe your wine from all manner of filth; and, if any of the dregs have ſtuck, either to the brim or ſides of the veſſels, they muſt be ſcraped and rubbed off; and, having put on the covers, they muſt be forthwith daubed over.

But, if you will preſerve your whole vintage with this ſame pitch, ſo that it may not be known, by the taſte of it, that the wine is pitched, it will be ſufficient to mix ſix ſcruples of the ſaid pitch with forty-five *ſextarii* of muſt, when it has left off fermenting, and the dregs are purged out of it, and not before; but you muſt put the 24th part of a *ſextarius* of toaſted and bruiſed ſalt into the ſame quantity of muſt. Nor muſt ſalt be put into wine of this character only, but, if it can be done, all ſorts of wine whatſoever, in all countries, ought to be ſalted with this very ſame quantity of ſalt; for this prevents the wine from becoming muſty.

CHAP. XXIV.

Of Nemeturian *Pitch for the preſerving of Wine.*

NEmeturian pitch is made in *Liguria*; but, that it may be made fit for preſerving wine, ſea-water muſt be taken out of the deep ſea, at as great a diſtance from the ſhore as can be done conveniently, and boiled into one half of the firſt quantity; and, when it is cooled to ſuch a degree, as not to burn the body when it is touched, we mix ſuch a quantity of it with the foreſaid pitch, as ſhall ſeem ſufficient; and we muſt ſtir it about carefully with a wooden ſpatula, or even with our hand, that if there be any blemiſh in it, or any part of it vitiated, it may be waſhed out. Then we muſt ſuffer the pitch to ſink to the bottom, and, when it is ſettled, ſtrain the water from it; afterwards we muſt waſh it twice or thrice in the remaining part of the boiled water, and work it ſo long, till it become of a bright-red ſhining colour; then, having ſtrained the water off it, we muſt let it ſtand in the Sun fourteen days, that whatever moiſture from the water ſhall remain in it, may be dried up. But in the night-time the veſſel muſt be covered, that the dew may not fall into it.

When we ſhall have, in this manner, prepared the pitch, and have a mind to preſerve our wines therewith, when they have now twice left off fermenting, we muſt put two *cyathi* of the foreſaid pitch into forty-eight *ſextarii* of muſt, in this manner: We muſt take two *ſextarii* of muſt out of that quantity we are going to preſerve; then, from theſe two *ſextarii*, we muſt, by little and little, pour the muſt into the two *cyathi* of pitch, and work it with our hand as it were honey and water, that it may the more eaſily mix with the muſt: but, when the whole two *ſextarii* of muſt are mingled with the pitch, and make, as it were, an unity of *ſubſtance*, then it will be proper to pour them into the veſſel from whence we took them, and to ſtir it about with a wooden ladle, that the medicament may be throughly mixed with it.

CHAP.

CHAP. XXV.

Of ſalt Water and ſtrong Brine for preſerving Wines.

FOraſmuch as ſome people, yea, even almoſt all the *Greeks* alſo, preſerve their muſt with ſalt-water or ſtrong wine, I thought that that part alſo of our care was not to be omitted. In the inland country, whither it is not eaſy to carry ſalt-water, ſtrong brine muſt be made for preſerves after this manner.

Rain-water is by much the fitteſt for this purpoſe; if not this, then that which flows from the cleareſt ſpring. Therefore you muſt take care to place in the Sun, five years before, a great quantity of either the one or the other of theſe, and put it up in the very beſt veſſels you have; then, when it is putrefied, you muſt let it ſtand ſo long, till it ſhall return to its former condition; when this is done, provide other veſſels, and ſtrain the water by little and little into them, till you come to the dregs; for there is always found ſome thick ſettlement in the bottom of water, which you let ſtand without ſtirring it.

When the water has been thus managed, it muſt be boiled into one third of the firſt quantity, after the manner of rob of grapes; and, into fifty *ſextarii* of ſweet water they put one *ſextarius* of ſalt, and a *ſextarius* of the beſt honey: theſe muſt be boiled all together, and all filthineſs purged out of them; and, when the water is cooled, a certain quantity of it muſt be put into an *amphora* of muſt.

But, if your land lie near the ſea, the water muſt be taken out of the deep when the winds are ſilent, and the ſea exceeding calm; and it muſt be boiled into a third part, after you have put, if you think proper, ſome of thoſe ſpices into it, which I mentioned above, that ſo the wine may have a better flavour after it is cured. But, before you take up the muſt out of the vat which is under the wine-preſs, ſuffumigate the veſſels with roſemary, or laurel, or myrtle, and fill them up to the brim, that, when the wine ferments, it may purge itſelf well; afterwards rub the veſſels with pine-apples. The wine which you have a mind ſhould be ſweeter than ordinary, you muſt preſerve it the day after you have taken it out of the vat; and that which you would have rougher, you muſt preſerve it the fifth day, and ſo fill up and daub the veſſels. Some alſo, having ſuffumigated the hogſheads, put the preſerve in firſt, and ſo pour in the muſt.

CHAP.

CHAP. XXVI.

Of Remedies for Wine that grows ſour.

IN whatever land the wine uſes to turn acid, you muſt take care, that, when you have gathered and trodden out the grapes, before the huſks are ſqueezed in the wine-preſſes, you pour the muſt into, and ſtrain it through the twig-baſket, and put to it a tenth part of ſweet well-water, out of the ſame ground, and boil it, till that water which you have added to it be boiled away; afterwards, when it is cooled, pour it into veſſels, and cover it, and plaſter it: thus it will keep the longer, and ſuſtain no damage.

It is better, if you put old water to it, which has been kept a great many years; and it is much better, if you put no water to it at all, and boil away the tenth part of the muſt, and decant it into a cold veſſel; and if, after it is boiled in, and grown cold, you mix an *hemina* of plaſter, or calcined ſtone, with ſeven *ſextarii* of muſt. The reſt of the muſt, which you have ſqueezed out of the huſks, uſe as ſoon as you can, or exchange it for money.

CHAP. XXVII.

Of making ſweet Wine.

YOU muſt make ſweet wine in this manner: Gather the grapes, ſpread them in the Sun during the ſpace of three days; on the fourth day, at noon, tread out the grapes; when they are warm, take up muſt of the firſt running, that is, the muſt which flows into the muſt-vat, before it is ſqueezed out of the grapes with the preſs; when it has left off fermenting, put well-bruiſed flower-de-luce, but not above an ounce-weight, into fifty *ſextarii* of it; ſtrain it off its dregs, and pour it into other veſſels. This wine will be ſweet, firm, holding, and wholſome for the body.

CHAP.

CHAP. XXVIII.

Of other wholſome Sorts of Preſerves.

OTHER kinds of medicaments, very proper for preſerving wines, and keeping them very firm, make after this manner: Bruiſe the very whiteſt *Iris*, or flower-de-luce, in a mortar; ſteep fenugreek in old wine; then expoſe it in the Sun, or in an oven, that it may grow dry; then pound it very ſmall: alſo mix bruiſed odoriferous things together into one maſs, that is, ſifted flower-de-luce, about the quantity of nine ounces, of fenugreek in weight nine ounces, of ſweet ruſh five ounces; then, into each hogſhead or veſſel, which may contain ſeven *amphoræ*, put, of this medicament, the weight of one ounce and eight ſcruples; of plaſter, made of calcined marble, three *heminæ* into each, when the muſt is the produce of marſhy places; but one *ſextarius* only, when it is of new vineyards: when the muſt is the produce of old vineyards, and dry places, put one *hemina* into each.

The third day, after you have trodden out *the grapes*, pour the preſerve into the muſt; but, before you put the preſerve into it, pour a ſmall quantity of the muſt from one veſſel into another, leſt, when you put the preſerve into it, it ferment with the medicament, and run over: but the plaſter, or the calcined marble, and the medicament, being thus prepared, mix throughly, in a pan, as much of them as ſhall be neceſſary for each wine-veſſel, and dilute that medicament with muſt, and put them into the veſſels, and mix them throughly; and, when the muſt has left off fermenting, fill it up preſently, and daub it over.

When you preſerve any wine whatſoever, do not preſently pour it into other veſſels, but let it reſt in the wine-veſſels; afterwards, when you have a mind to pour it out of the barrels or hogſheads into other veſſels, having taken it as clear off the dregs as you poſſibly can, in the Spring, when the roſe is bloſſoming, transfer it into veſſels that are well-pitched, and exceeding clean. If you are deſirous to keep it till it be old, put a *ſextarius* of the very beſt wine, or three *ſextarii* of freſh generous dregs, into a firkin, containing two *urns*; or, if you have freſh veſſels, out of which wine has been taken, pour it into them: if you do any one of theſe things, the wine will be much better and firmer. Alſo, if you put good odours into it, you will hinder it from contracting any bad ſmell or taſte whatſoever; for there

there is nothing that attracts to itſelf the ſmell of other things more quickly than wine.

CHAP. XXIX.

After what Manner Muſt may be kept always ſweet, as if it were new.

THAT muſt may continue always ſweet, as if it were new, manage it thus: Before the huſks of the grapes are put under the preſs, take the very freſheſt muſt out of the wine-fat, and put it into a new *amphora*, and daub it, and pitch it carefully, that no water at all may enter into it; then ſink the whole *amphora* into a pond of cold and ſweet water, ſo that no part of it may ſtand out of it; then, after forty days, take it out of the pond: thus it will continue ſweet for a whole year.

CHAP. XXX.

Of the beſt Way of curing Wine, and of Remedies for Wine that is upon the Decay.

FROM that time, when you ſhall have firſt put the covers upon the wine-veſſels, till the vernal Equinox, it is ſufficient to cure the wine once in xxxvi days, and after the vernal Equinox twice; or, if the wine begins to flower, you muſt cure it oftener, leſt its flower fall to the bottom, and vitiate the taſte of the wine: the greater the heat is, the oftener is it proper that wine be nouriſhed, cooled, refreſhed, and vent given to it; for, as long as it is kept abundantly cold, ſo long will it continue in good condition.

The brims and chops of the veſſels muſt always be rubbed with pine-apples, as often as the wine is cured: if your wines be rougher, or not ſo good as you could wiſh, which may be occaſioned by the bad quality of the ground, or by the weather, take the dregs of good wine, and make it into cakes, and dry them in the Sun, and toaſt them at the fire; afterwards bruiſe them ſmall, and rub a quarter of a pound of them into each *amphora*, and plaſter it, and the wine will become good.

CHAP.

CHAP. XXXI.

Of Remedies, in caſe any living Creature fall into the Muſt, and periſh in it.

IF any living creature ſhall fall into the muſt, and periſh in it, as a ſerpent, or a mouſe, or a rat; leſt it make the wine of a bad ſmell, if the body be found, let it be burnt in the fire, and the aſhes of it poured in cold into the veſſel into which it did fall; and let it be throughly mixed with a wooden ladle: this thing will be a remedy for it.

CHAP. XXXII.

Of Horehound-wine.

MANY think, that horehound-wine is uſeful for all diſeaſes of the bowels, and eſpecially for the cough. When you make your vintage, gather tender ſtalks of horehound, chiefly from uncultivated and lean places, and dry them in the Sun; then make them into bundles, and bind them with a palm- or ruſh-rope, and put them into a hogſhead, ſo that the band may be on the outſide: put VIII ponnds of horehound into CC *ſextarii* of ſweet muſt, that ſo it may continue in it, till the muſt leave off fermenting; afterwards take out the horehound, and, when the wine is well cleanſed, daub it carefully.

CHAP. XXXIII.

Of Squil-wine.

YOU muſt in this manner prepare and preſerve Squil-wine, for promoting digeſtion, and repairing the body; and alſo for an old cough, and for the benefit of the ſtomach. Forty days before you deſign to gather grapes for wine, firſt gather the Squil, and cut it exceeding ſmall, like the root of a radiſh, and hang up the ſmall

cuttings of it in the ſhade, that they may dry; then, when they are dry, put a pound-weight of the dry ſquil into XLVIII *ſextarii* of *Aminean* muſt, and let it remain in it for XXX days; afterwards take it out, and, after you have ſeparated the wine from the dregs, put it up into two *amphors*. Others write, that a pound-weight and a quarter of dry ſquil muſt be put into forty-eight *ſextarii* of muſt: and this very thing I do not diſapprove.

CHAP. XXXIV.

Of Squil-vinegar.

THEY who have a mind to make Squil-vinegar for ſauce, put this very weight of ſquil, which I have mentioned above, into two *urns* of vinegar, and ſuffer it to remain forty days in it: into three *amphoræ* of muſt you put a *congius* of ſharp vinegar, or two *congii*, if it is not ſharp; and in a pot, which contains four *amphoræ*, you boil it in one fourth part; or, if the muſt is not ſweet, one third part; let it be ſcummed. But let the muſt be of the middle ſort, and very clear.

CHAP. XXXV.

How you muſt make Wormwood-wine, Hyſſop-wine, Southernwood- and other Sorts of Wine.

YOU muſt make up and prepare wormwood- hyſſop- ſouthernwood- thyme- pennyroyal- and fennel-wines, after this manner: Boil one pound-weight of *Pontic* wormwood, with four *ſextarii* of muſt, till one fourth part of it be boiled away; what remains of it, put it cold into an *urn* of *Aminean* muſt: do the ſame with the other things above-mentioned. Alſo three pounds of dry pennyroyal may be boiled with a *congius* of muſt, till a third part of it be boiled away; and, when the liquor is cooled, and the pennyroyal taken out of it, it may be put into an *urna* of muſt; and this is very proper to be given preſently, to ſuch as are affected with the cough during the Winter; and this is called pennyroyal-wine.

CHAP.

CHAP. XXXVI.

Of Muſt of the laſt Preſſing, or ſqueezed Muſt.

SQueezed muſt is that which is preſſed out, when the maſs of the huſks of the grapes is cut after the firſt preſſing: You ſhall throw that muſt into a new veſſel, and fill it up to the brim; then you ſhall put to it ſmall branches of dry roſemary, tied together with flax, and ſuffer them to ferment together for ſeven days; then you ſhall take out the bundle of ſmall branches, and, when the wine is carefully purged, plaſter it up: but it will be ſufficient to put a pound and an half of roſemary into two *urns* of muſt. After two months you may uſe this wine for a remedy.

CHAP. XXXVII.

To make Wine like to Greek *Wine.*

GAther the very ripeſt early-ripe grapes, and dry them three days in the Sun; tread them out the fourth day, and throw the muſt, which has none of the laſt preſſing in it, into a hogſhead, and take diligent care, that, when it has left off fermenting, the dregs be purged out of it; then the fifth day, when you have purged the muſt, put two *ſextarii* of toaſted and ſifted ſalt; or, which is the leaſt quantity, one *ſextarius* to XLIX *ſextarii* of muſt. Some alſo mix a *ſextarius* of rob of grapes, (muſt ſodden in to one third of the firſt quantity) with it. Some alſo add two *ſextarii* to it, if they think, that the wine is not of a very firm and holding kind.

CHAP. XXXVIII.

How you may make Myrtle-wine.

MAKE myrtle-wine for gripings of the guts, and a looſeneſs, and for a weak ſtomach, after this manner: There are two kinds of myrtle-trees, of which the one is black, and the other white; the

berries of the black kind are gathered when they are ripe, and their ſeeds taken out; and the berries themſelves, without the ſeeds, are dried in the Sun, and laid up in a dry place, in an earthen jar.

Then, in the time of the vintage, when the Sun is hot, they gather *Aminean* grapes, that are throughly ripe, off old vines that are ſupported with trees; or, if they have no ſuch vines, they gather them from the oldeſt vineyards they have; and the muſt that they have from theſe they put into a wine-veſſel; and preſently, the firſt day, before it ferments, they carefully bruiſe the myrtle-berries, that they have laid up; and they weigh as many pounds of them, after they are bruiſed, as they deſign to prepare amphors of wine: then we take a little muſt out of that veſſel which we are going to put the berries into, and ſprinkle it upon that which we have bruiſed and weighed, as it were, upon meal. Afterwards we make up ſeveral ſmall maſſes of it, and ſo let them down by the ſides of the veſſel into the muſt, leſt one of the lumps ſhould fall upon the other.

Then, when the muſt has twice left off fermenting, and has been twice cured, they bruiſe again the ſame quantity of berries, and in the ſame manner as I ſaid above: but they do not make them into ſmall maſſes or lumps, as before; but they take muſt out of the ſame veſſel, and put it into a pan, and mix it throughly with the foreſaid quantity of bruiſed berries, ſo as it may be like thick broth; and, when it is throughly mixed, they pour it all together into the ſame wine-veſſel, and ſtir it throughly with a wooden ſlice. Then, nine days after they have done this, they purge the wine, and rub the veſſel with ſmall bruſhes of dry myrtle, and put the cover upon it, that nothing may fall into it: this being done, after the ſeventh day they purify the wine a ſecond time, and pour it into firkins that are well-pitched, and have a good ſmell. But you muſt take care, when you pour it into veſſels, that you pour it into them clear, and without dregs.

Another kind of myrtle-wine mingle after this manner: Boil *Attic* honey thrice, and ſcum it as often; or, if you have no *Attic* honey, chooſe the very beſt you can find, and ſcum it four or five times; for the worſe it is, the more filth it has in it: then, when the honey is cooled again, gather the very ripeſt berries of the white kind of myrtle, and break them, ſo as not to bruiſe with them the ſeeds that are within them; and, having preſently ſhut them up in a wooden baſket, preſs the juice out of them, and mix about ſix *ſextarii* of their juice with one *ſextarius* of boiled honey; and, after you have poured it into a little ſtone bottle, plaſter it over. But this ought to be done in the month

month of *December*, at which time commonly the ſeeds of the myrtle are ripe: and you muſt obſerve, that the weather be fair and clear ſeven days before the berries are gathered, if it can be done; but, if not, that it be fair weather not leſs than three days before, or, at leaſt, that it has not rained; and you muſt take care, that they be not gathered with the dew upon them.

Many gather the black or white myrtle-berry after it is fully ripe; and, having expoſed it for two hours, and dried it a little in the ſhade, they bruiſe it ſo, that the ſeeds it contains may, as much as poſſible, remain intire; then they ſqueeze the juice out of what they have bruiſed, through a flaxen frail, and, having ſtrained it very clear through a ruſh-ſtrainer, they put it up in ſmall ſtone bottles, well-pitched, without mixing honey, or any other thing with it. This liquor is not ſo durable; but, as long as it keeps without ſpoiling, it is of greater benefit to health, than that other ſort of compoſition made with the juice of myrtle-berries.

There are ſome, who, having ſqueezed out this very juice, if they have a larger quantity of it, boil it in to a third part, and, when it is cooled, put it up in well-pitched ſmall ſtone bottles. When it is prepared after this manner, it keeps longer; but that which you ſhall not have boiled, may keep ſound, without ſuſtaining any hurt, for two years, provided you make it very clean, and with great care.

CHAP. XXXIX.

After what Manner Wine may be made of Grapes dried in the Sun.

MAGO directs the beſt raiſin-wine to be made in this manner, as I myſelf alſo have made it; *viz.* To gather the early-ripe grapes when they are very ripe, and to reject ſuch of the berries as are withered or ſpoiled; to faſten in the ground forks or ſtakes, at the diſtance of four feet the one from the other, for ſupporting reeds, and to couple them together with poles; then to put reeds upon them, and to ſpread the grapes in the Sun, and cover them during the night, leſt they be wet with the dew; then, when they are throughly dried, to pluck off the berries, and throw them into a barrel or hogſhead, and to put the very beſt muſt to them, till all the grapes are covered with it: when the grapes ſhall have drunk it up, and filled themſelves

ſelves with it, to put them all together into a frail the ſixth day, and preſs them in the wine-preſs, and take the dried raiſin-wine from them; afterwards to tread the huſks, after the very freſheſt muſt, which has been made of other grapes, which you have expoſed to the Sun for the ſpace of three days, has been put to them; then, to mix all together, and put the whole kneaded maſs of bruiſed grapes under the preſs, and preſently to put up this ſecondary raiſin-wine, in plaſtered veſſels, that it may not become too rough: then, after twenty or thirty days, when it has left off fermenting, to pour it very clear into other veſſels; and preſently to plaſter the covers, and cover them with ſkin.

If you would make raiſin-wine of the *Apian* grape, gather the *Apian* grape ſound and intire; purge them of ſuch grains as are rotten and ſpoiled, and put them apart by themſelves; afterwards hang them up on poles, and order it ſo, that the poles may be always in the Sun. After the berries are ſhrivelled enough, pull them off, and throw them into a tub without the ſtalks, and tread them well with your feet. When you have made one floor or ſtory of them, ſprinkle old wine upon it; afterwards tread down another upon it, and alſo ſprinkle wine on it. In the ſame manner tread a third ſtory, and continue to pour wine upon them, ſo that it may ſwim above them, and let them alone for five days; afterwards tread them with your feet, and preſs the grapes in a new wicker-baſket.

Some prepare old rain-water for this uſe, and boil it in one third; then, having dried the grapes in the Sun, in the manner above deſcribed, they put boiled water inſtead of wine, and manage the reſt after the ſame manner. This wine, where there is plenty of wood, is made with very little charge, and comes very cheap; and, when it is uſed, it is even ſweeter than the other ſorts of raiſin-wine above-mentioned.

CHAP. XL.

How the beſt ſmall thin Wine may be made.

THE beſt ſmall thin wine is made in this manner: Conſider how many firkins the tenth part of the quantity of wine, which you have made in one day, may amount to; and put as many firkins of freſh water to the huſks of the grapes; but let them be ſuch as wine of one day old has been preſſed from: pour likewiſe, into the ſame

ſame place, the ſcum of the muſt that has been ſodden in to one third, or one half of the firſt quantity for making rob of grapes, and the dregs out of the wine-vat, and mix them throughly together; and let this mixed maſs ſoak for one night: the day after tread it with your feet; and, when it is thus throughly mixed, put it under the wine-preſs; then put up that which flows from it, either in hogſheads or *amphors*; and, when it has left off fermenting, ſtop them up: but it is more commodiouſly kept in *amphors*. *M. Columella* made this ſelf-ſame thin ſmall wine of old water; and ſometimes he kept it above two years without ſpoiling.

CHAP. XLI.

How to make the beſt Honey-wine (1).

MAKE the beſt honey-wine thus: Take up preſently, out of the wine-vat, the pureſt muſt which diſtils from the grapes, before they are too much trodden: but make it of the muſt of grapes of that kind of vine which grows upon trees, and which you have gathered in dry weather. Into an urn of muſt you ſhall put ten pound-weight of the beſt honey; and, having mixed it carefully with the muſt, you ſhall put it up in a ſtone bottle, and immediately plaſter it, and order it to be laid up in a loft: if you have a mind to make a greater quantity of it, you ſhall put honey to it in the proportion above-mentioned. After thirty-two days you muſt open the bottle; and, after you have ſtrained the muſt, and put it very clear into another veſſel, plaſter it, and ſet it into an oven.

A preſerve, or ſyrup of quinces, is made in this manner: They boil an urn of *Aminean* muſt of the grapes of vines, ſupported by trees, in a new earthen or tin pot, and twenty large quince-apples well cleanſed, and ſound ſweet pomegranates, which they call *Carthaginian* apples, and ſorb-apples not throughly ripe, divided, and their ſeeds taken out, which may be of about the quantity of three *ſextarii*: theſe are ſo boiled, that all the apples may diſſolve in the

(1) The title of this chapter, in all the editions I have ſeen, is by no means agreeable to the deſign of it; which, among other things, is to direct how to make honey-wine, but ſays nothing of making what they call *mustum lixivum*, by which is underſtood that muſt which drops from the grapes of its own accord, before they are preſſed: therefore I have made the firſt words of the chapter the title of it.

muſt; and let there be a boy to ſtir and mix the apples throughly with a wooden ſlice or reed, that they may not be burnt-to. Then, after they are boiled, ſo that there is not much of the liquor remaining, they ſet them to cool, and ſtrain them; and ſuch of them as ſubſide in the ſtrainer, they carefully bruiſe and ſmooth, and boil a ſecond time in their own juice, upon a ſlow fire of charcoal, that they may not burn-to, till the liquor that ſettles to the bottom appears like dregs. Nevertheleſs, before the medicament is taken off the fire, they add to it, over-and-above all, three *heminæ* of *rhus Syriacus*, bruiſed and ſifted; and mix it throughly with a wooden ſpatula, that it may incorporate with the reſt: then, when the medicament is cooled, they put it into a new-pitched earthen veſſel; and, when they have plaſtered it, they hang it up high, that it may not contract a paleneſs.

CHAP. XLII.

Of preſerving Cheeſe.

WE muſt preſerve cheeſe in this manner: Cut large pieces of dry ewe-milk-cheeſe of the laſt year, and ſtow them in a pitched veſſel; then fill it with the beſt kind of muſt, ſo that it may cover the cheeſe; and let there be a larger quantity of liquor, than of cheeſe; for the cheeſe drinks it up, and ſpoils, unleſs the muſt always ſwim above it. But, when you have filled the veſſel, you muſt plaſter it immediately; then after twenty days you may open it, and uſe it with any kind of ſauce or ſeaſoning you pleaſe; and by itſelf alſo it is not unpleaſant.

CHAP. XLIII.

After what Manner potted Grapes may be put up and kept.

WHEN you have cut off from the vine the *Bumaſt* grapes, or ſuch as have hard and thick ſkins, or ſuch as are of a purple colour, pitch their pedicles or ſtalks immediately with hard pitch; then fill a ſmall new earthen pan with the very drieſt ſifted chaff, that it may be without any duſt in it; and ſo place the cluſters of grapes upon

upon it; then cover it with another earthen pan, and daub it all round with clay mixt with ſtraw; and ſo, after you have ſtowed the pans in a very dry loft, cover them all over with dry chaff.

And all ſorts of grapes whatſoever may be kept without ſpoiling, if they be plucked off the vine in the decreaſe of the Moon, and in fair weather, after the fourth hour of the day, and when they have already had the Sun for ſome time upon them, and have no dew upon them. But let a fire be made in the next large croſs-way, that the pitch may be boiling hot, into which the ſtalks of the cluſters may be preſently dipt; throw a firkin of the rob of grapes, or muſt boiled in to a third part of the firſt quantity, into a well-pitched barrel; then thruſt in croſs-pieces of wood very cloſe, ſo as they may not touch the ſodden muſt; then place new earthen diſhes upon them, and in them ſo diſpoſe the bunches of grapes, that one of them may not touch the other; then put covers upon the diſhes, and daub them over. Then build a ſecond ſtory after the ſame manner, and a third, and as long as the bigneſs of the barrel will allow, and ſtow the bunches after the ſame manner; then having pitched the cover of the barrel, anoint it thoroughly with ſodden muſt; and, when you have put it on, ſtop it up cloſe with aſhes.

Some, after they have put the ſodden muſt into the barrel, content themſelvee with thruſting in tranſverſe pieces of wood very cloſe, and hanging the bunches of grapes upon them, ſo as not to touch the ſodden muſt; then having put on the cover, daub it all over. Others, after they have gathered the grapes, in the manner as I ſaid above, dry new ſmall barrels in the Sun, without any pitch; then, when they have cooled them in the ſhade, put barley-bran into them, and place the bunches of grapes ſo upon it, as one of them may not preſs upon another; then they pour in the ſame kind of bran upon them, and place another row of bunches in the ſame manner; and this they do, till they fill the barrel with bran and bunches of grapes by turns; and, when they have put the cover upon it, they daub it over, and lay up the grapes in a very dry and cold loft.

Some, after the ſame method, preſerve green grapes with dry poplar- or evergreen-oak-ſaw-duſt. Others cover over, with dry parget-flower, the bunches of grapes which they have plucked off the vines before they are too ripe. Others, when they have gathered the grapes, if there are any of the grapes ſpoiled, cut them off with a pair of ſheers, and ſo hang them up in a barn, where there is wheat placed under them. But this method makes the berries to ſhrivel, and become wrinkly, and almoſt as ſweet as raiſins dried in the Sun.

Marcus Columella, my uncle, ordered broad veſſels, after the manner of diſhes, to be made of that ſort of clay wherewith they make the *amphoræ*, and to be pitched very thick, both on the inſide and outſide; and after he had prepared them, he ordered the purple-coloured, and the bumaſt grapes, and the *Numiſian*, and the thick and hard-ſkinned grapes to be gathered, and their ſtalks, without delay, to be dipt into boiling pitch, and every kind to be put up ſeparately by itſelf, ſo that the bunches might not touch each other: after this he ordered covers to be put upon them, and that they ſhould be daubed with thick plaſter; then, after all, to be pitched with hard pitch, which was melted upon the fire, ſo that no moiſture whatſoever might be able to paſs through; then he ordered the whole veſſels to be ſunk in ſpring- or ciſtern-water, with weights laid upon them, and that no part of them ſhould be ſuffered to appear above the water. Thus grapes are exceedingly well preſerved: but, when they are taken out of the water, unleſs they be eaten that very day, they grow ſour.

Nevertheleſs, there is nothing ſurer than to make earthen veſſels, which may contain one ſingle bunch of grapes each, with room ſufficient: theſe veſſels ought to have four handles, wherewith they may hang tied to the vine; alſo their covers ought to be ſo formed, as to be divided in the middle, that ſo, when the veſſels are hung up, and have received a bunch of grapes into each of them, the two parts or diviſions of the covers, being applied on both ſides, may join together, and cover the bunches of grapes: and both the veſſels and their covers ought to be carefully pitched, both on the inſide and on the outſide; then, when they have covered the grapes, they ought to be covered over with abundance of clay mixed with ſtraw: but the cluſters of grapes, which hang upon the mother vine, ought to be put up into the pipkins, ſo as no parts of them may touch the veſſels.

But the time when they ought to be ſhut up in the vaſes, is commonly when the weather is as yet very dry and fair, and the berries or grains of the cluſters plump, and of divers colours. This, upon the whole, we ſtrictly injoin, above all things, that apples and grapes be not laid up together in the ſame place, nor in any place near to one another, from whence the ſmell of the apples may reach them: for, with this kind of ſteam, the grains of the cluſters quickly ſpoil and rot. Nevertheleſs, the methods of keeping and preſerving apples or grapes, which we have mentioned, are not all proper for all regions; but ſome of them agree with one, and ſome with another, according to the nature of the places, and the qualities of the grapes.

The

The antients, for the moſt part, put up in veſſels the *Scircitulan*, the *Venuculan*, and the larger *Aminean* and *Gallican* grapes, and ſuch as were of large, and hard, and thin berries: but now, in and about the city, the *Numiſian* grapes are moſt approved for this uſe; they gather the choiceſt of theſe when they are moderately ripe, in fair weather, after the Sun has removed the dew, about the fourth or fifth hour of the day, provided the Moon be decreaſing, and under the earth; then they place them upon hurdles, ſo that the bunches may not bruiſe one another; then, afterwards, they bring them into the houſe, and, with a pair of ſheers, cut off the dry, withered, and rotten berries; and, after they are cooled a little in the ſhade, they put three or four bunches of them into the pots, according to the largeneſs of the veſſels, and ſtop up the covers carefully with pitch, that they may not let the moiſture paſs through: then they take out the maſs of the huſks of the grapes, which have been well ſqueezed in the wine-preſs, and, having ſeparated the ſtalks pretty well from them, and looſened the bruiſed maſs of the huſks, they ſpread them in the bottom of the barrel, and ſtow the pots therein with their mouths downward, at ſuch a diſtance from each other, that the huſks and grape-ſtones may be trodden in between them; and when, with theſe preſſed cloſe together, they have made the firſt ſtory; they ſtow other pots in the ſame manner, and fill up the ſecond ſtory, then, after the ſame manner, the barrel is filled up with rows or ſtories of pots, one above another, which are made faſt with the huſks and grape-ſtones, trodden in cloſe about them; then they preſently fill up the veſſel to the brim with huſks, and preſs them cloſe together; and, after they have put the cover upon it, they immediately daub the barrel with aſhes, tempered after the manner of plaſter. Nevertheleſs, it is neceſſary to caution him, who is about to buy theſe veſſels, that he do not buy the pots which imbibe the moiſture, or are not well baked; for both theſe things ſpoil the grapes, by letting the water paſs through. Moreover, when the pots are brought out for uſe, a whole row or ſtory of them muſt be pulled down at once; for the huſks and grape-ſtones, which are preſſed cloſe together, if they are once moved, quickly grow ſour, and ſpoil the grapes.

CHAP. XLIV.

After what Manner Pomegranates may be preſerved.

AFTER the vintage follow the compoſitions of autumnal things, which of themſelves very much inlarge the care and buſineſs of the Bailiff's Wife: nor am I ignorant, that there are many things, which *Caius Matius* has moſt carefully treated of, which I have not brought together, and put into this book. For what he propoſed to himſelf was, to give directions about furniſhing, preparing, and ſetting in order plentiful tables, and making magnificent entertainments in town. He publiſhed three books: the one he called the *Cook*, the other the *Fiſhmonger*, and the third the *Oilman*. Nevertheleſs, we are abundantly ſatisfied with ſuch things, as may fall to the ſhare of rural ſimplicity, and are eaſily attainable, and without any great expence; as, in the firſt place, all ſorts of apples.

And, that I may begin with the pomegranates, ſome twiſt their pedicles or ſtalks as they grow upon the tree, that the apples may not burſt with the rains, or, chapping, utterly periſh; and they tie the apples to the larger branches, that they may remain unmoved: then they incloſe the tree with nets made of *Spaniſh* broom, leſt the apples be torn, either by crows, or rooks, or other fowls. Some fit ſmall earthen pots to the apples, as they hang on the trees; and, having daubed them over with clay mixed with ſtraw, ſuffer them to ſtick to the trees: others wrap them up, one by one, in hay or ſtraw; and, moreover, daub them over very thick with clay mixed with ſtraw, and ſo bind them to the larger branches, that they may not, as I ſaid, be moved with the wind.

But all theſe things ought to be carefully done, as I ſaid, in fair weather, and when there is no dew upon them; which, nevertheleſs, ought either not to be done at all, becauſe the ſmall trees are hurt thereby; or, at leaſt, it ought not to be put in practice every year, eſpecially conſidering, that we may keep the apples very ſafely, even when they are pulled off the trees, without ſuſtaining any damage: for, even within-doors, you may make ſmall trenches of three feet dimenſion, in a very dry place; and, after you have put a ſmall quantity of very ſmall earth into them, you faſten ſmall branches of the elder-tree therein; then, when the weather is fair, you gather the pomegranates with their pedicles, and inſert them into the elder-

tree-branches [for the elder-tree has its pith ſo looſe and open, that it may eaſily receive the pedicles of the apples]. But you muſt take care, that the apples be not leſs than four inches diſtant from the earth, and that they do not touch one another. Then you put a cover upon the ditch you have made, and daub it all round with clay mixed with ſtraw, and heap the earth upon it, that was digged out of it.

This ſame thing may be done in a tub or barrel, if any one ſhall have a mind to fill a veſſel half-full, either with ſmall, looſe earth, or, which ſome like better, with river-ſand; and to do all the other things after the ſame manner. Indeed, *Mago* the *Carthaginian* orders ſea-water to be made exceeding hot, and the pomegranates to be tied with flax or ruſhes, and let down into it for a little while, till they be diſcoloured; and, after they are taken out, to be dried three days in the Sun, and afterwards to be hung up in a cold place; and, when there is occaſion to uſe them, to ſteep them in cold freſh water one night, and the day following, till the hour when they are to be uſed. But the ſame author alſo directs us, to daub the freſh apples all over, very thick, with well-wrought potters-clay; and, when the clay is dried, to hang them up in a cold place; afterwards, when there is occaſion to uſe them, to put them into water, and ſoften the clay. This method preſerves the apple as freſh, as if it were newly gathered.

The ſame *Mago* commands us to ſpread poplar- or evergreen-oak-ſaw-duſt, in the bottom of a new earthen pot, and to ſtow the apples ſo, that the ſaw-duſt may be trodden in between them; then, after the firſt ſtory is finiſhed, to ſpread ſaw-duſt a ſecond time, and ſtow the apples after the ſame manner, till the pot be filled; and, when it is full, to put a cover upon it, and daub it over carefully with thick clay.

But all ſorts of apples whatſoever, that are laid up in order to be kept for a long time, ought to be gathered with their pedicles, and even with their ſmall branches alſo, provided it can be done without any injury to the tree; for this contributes very much towards preſerving them for a long time. Many pull them off the trees with their ſmall boughs; and, when they have carefully covered the apples over with potters-clay, dry them in the Sun: then, if the potters-clay chap in any place, they daub it over with common clay; and, when they are dried, hang them up in a cold place.

CHAP.

CHAP. XLV.

How Globe-apples, or Pome-paradiſes, Honey-apples, Seſtian *Apples, and other Kinds, may be preſerved.*

MANY preſerve and keep quinces in pits, or trenches, or in barrels, in the ſame manner as they do pomegranates. Some bind them up in fig-tree-leaves; then they knead potters-clay with lees of oil, and daub the apples with it; and, after they are dry, lay them up in a loft, in a cold and dry place. Others put up theſe ſame apples into pans, and cover them all over with dry parget, ſo that they may not touch one another.

Nevertheleſs, we have not experienced any thing ſurer or better, than, in fair weather, and in the wane of the Moon, to gather the ripeſt quinces, that are ſound, and without any blemiſh; and after the down, which is upon the apples, is wiped off, to put them up lightly, and very looſe, that they may not be bruiſed the one againſt the other, in a new ſtone bottle with a very wide mouth; then, when they are ſtowed up to the neck of the bottle, to thruſt them down cloſe to one another, with willow-twigs laid croſs them in ſuch a manner, as gently to compreſs the apples, and not ſuffer them to be lifted up with the liquor, when it is poured in upon them; then to fill the veſſel to the brim with the beſt and the moſt liquid honey, ſo that the apples may be intirely covered with it. This method not only preſerves the apples themſelves ſafely, but alſo affords a liquor of an honey-wine taſte, which ſometimes may be given, without any hurt, to ſuch as are ſick of a fever; and it is called *ſyrup of quinces and honey.*

But you muſt take care, that the apples, which you would preſerve with honey, be not gathered, and put up, before they are ripe; becauſe, if they be gathered green, they grow ſo hard, that they are of no uſe. But that which many do, *viz.* dividing them with an ivory knife, and taking out the ſeeds, becauſe they think they ſpoil the apple, is intirely ſuperfluous: but the method which I have now taught, is, indeed, ſo ſure, that, altho' there even be a little worm in them, yet the apples ſpoil no further, after they have received the foreſaid liquor; for, ſuch is the nature of honey, that it puts a ſtop to any blemiſh or corruption, and ſuffers them not to ſpread any further;

ther; for which reaſon, it preſerves alſo a dead human body ſound and intire for very many years.

Other kinds of apples therefore, ſuch as the *orbicular*, or *pome-paradiſes*, or *Seſtian*, *Matian*, and honey-apples, may be ſafely kept and preſerved in this liquor; but becauſe, preſerved after this manner, they ſeem to grow ſweeter in the honey, and not to retain their own natural taſte; ſmall cheſts of beech, or of lime-tree alſo, ſuch as Senators or Judges robes are laid up in, but ſomewhat larger, ought to be prepared for this purpoſe, and placed in a very cold loft, and in a very dry place, where neither ſmoak, nor noiſom ſmell, may come; then, having ſpread the forementioned ſaw-duſt under them, the apples ought to be ſo ranged, that their fleurets (1) may look upwards, and their pedicles or ſtalks downwards, after the ſame manner as they grew upon the tree, and ſo as not to touch one another.

Alſo particular care muſt be taken, that each kind be put up ſeparately in their own little cheſts; for, when different kinds are ſhut up together, they diſagree one with another, and are more ſpeedily corrupted and ſpoiled: for which reaſon alſo the wine of ſuch vineyards, as are planted with different ſorts of plants, is not ſo firm, as if you ſhould put up pure unmixed *Aminean*, or *Apian*, or even dreggy wine by itſelf. But when the apples, as I ſaid before, are thus carefully packed up, let them be covered with the lids of the cheſts, and let the lids be daubed all over with clay mixed with ſtraw, that the air may not be able to get in. And theſe very apples ſome people keep very ſafely, as they do other ſorts of apples, as we ſaid above, by putting poplar-ſaw-duſt, and others alſo fir-ſaw-duſt between them: nevertheleſs, theſe apples ought to be gathered, not ripe, but very bitter.

CHAP. XLVI.

Of Pickling of Elecampane.

THE pickling of Elecampane ſhall be performed in this manner: After you have digged up the root of it out of the earth, in the month of *October*, when it is come to its greateſt maturity, wipe

(1) *Floſculi*, *fleurets*: that part of the apple, oppoſite to the pedicle, is called *floſculus*, it being the place where the bloſſom was. It is ſometimes called *umbilicus*, the navel of the apple.

off

off, with a coarſe rough linen cloth, or even with a hair-cloth, whatever ſand ſhall ſtick to it; then ſcrape it ſlightly with a very ſharp knife; and where the ſmall root is fulleſt, in proportion to its thickneſs cleave it into two or more parts of a finger's length; then boil them moderately with vinegar, in a braſs pot, ſo that the ſlices may not be burnt-to: after all this let them be dried three days in the ſhade, and ſo put up into a pitched jar; and wine, made of raiſins dried in the Sun, or muſt boiled into a third part of its firſt quantity, added to them, till it ſwim above them; and, having put a ſtuffing of ſavory, or wild marjoram, upon them, let the veſſel be ſhut up, and covered with leather.

There is another way of pickling Elecampane: When you have ſcraped the roots of it, cut them into ſlices, as above, and dry them in the ſhade for the ſpace of three, or even four days; then, when they are dried, having put wild marjoram among them, throw them into veſſels without any pitch; and, having alſo put wild marjoram upon them, with ſix parts of vinegar, let one part of muſt, ſodden into one half of its firſt quantity, be mixed with an *hemina* of toaſted ſalt, that the ſlices may be ſoaked in this liquor, till they have very little of a bitteriſh taſte: afterwards, being taken out, let them be dried a ſecond time, for the ſpace of five days, in the ſhade; then pour together, into a pot, the ſediment of dreggy wine, and of honey-wine alſo, if you have it, and the fourth part of both theſe of good muſt ſodden into a third part; and, when it has boiled, put the ſlices of Elecampane to it, and remove it preſently from the fire, and ſtir them throughly with a wooden ſpatula, till they grow perfectly cold; after which pour them into a pitched jar, cover them with its lids, and then put a cover of leather upon it.

There is a third way to pickle the ſame Elecampane: When you ~~have carefully ſcraped the ſmall roots~~, ~~cut them into ſmall pieces~~, and ſteep them in ſtrong brine, till they loſe their bitterneſs; then, having poured out the brine, bruiſe the very beſt and ripeſt ſervice-apples, after you have taken out the ſeed, and mix them with the Elecampane; then add to it either wine made of raiſins dried in the Sun, or the very beſt muſt ſodden into one third, and ſtop up the veſſel. Some, after they have pickled the Elecampane, and ſoaked it in ſtrong brine, dry it, and mix it with bruiſed quinces, which they have boiled before in honey, or in muſt ſodden into one third; and ſo pour raiſin-wine, or muſt ſodden in to one third, upon them; and, when they have put the lid upon the veſſel, cover it with leather.

CHAP.

CHAP. XLVII.

Of pickling of Olives.

IN the months of *September* or *October*, while it is yet vintage, bruiſe the bitter *Pauſian* olive; and, having ſteeped it a little in warm water, ſqueeze it; and, after you have mixed it with a moderate quantity of toaſted ſalt, put it up in a jar with the ſeeds of fennel, and of the maſtich-tree, and pour the very freſheſt muſt into it; then put a ſmall bundle of green fennel upon them, and preſs it down into the liquor, that the olives may be preſſed down, and the liquor appear above them: having thus managed your olives, you may uſe them the third day.

When you bruiſe the white *Pauſian*, or the large and round, or the long *ſhuttle-olive*, or the royal olive; firſt plunge each of them into cold ſtrong brine, that they may not loſe their colour; and, when you have ſuch a quantity of any of them ready as may be ſufficient to fill a jar, ſpread a bundle of dry fennel in the bottom of it; then take care to have, in a little pot, the ſeeds of green fennel, and of the maſtich-tree, ſtript off their ſtalks, and cleanſed; then take the olives out of the brine, and ſqueeze them; and, when you have mixed them with the foreſaid ſeeds, put them into the veſſel; and then, when they come up to the neck of the veſſel, put bundles of dry fennel upon them, and mix two parts of freſh muſt, and one of ſtrong brine together, and put it to them. You may uſe olives very agreeably the whole year, when you put them up in this ſort of pickle.

Some do not bruiſe the olive, but cut it with a ſharp reed: this, indeed, requires more labour, but it is much better; for this olive is fairer and whiter than that which contracts a blueneſs from contuſion. Others, whether they bruiſe or cut the olives, mix them with a little toaſted ſalt, and the foreſaid ſeeds; then they pour in muſt ſodden in to one half of the firſt quantity, or raiſin-wine, or a liquor made with freſh bees-wax and water, if they can have it. We gave directions a little before, in this ſelf-ſame book, how this liquor may be made; all the reſt of the things they manage after the ſame manner.

Chuſe the very faireſt and whiteſt *Pauſian* or *royal olives*, which have been ſtript off the tree by hand, and are without a ſpot upon them; then throw them into an *amphora*, after you have ſpread dry

fennel under them, and mixed maſtich- and fennel-ſeeds with them; and, when you have filled the veſſel to the neck, put ſtrong brine to them; then make a ſtuffing of the leaves of reeds, and preſs down the olives therewith, that they may be ſunk below the liquor; and pour in ſtrong brine a ſecond time, till it come to the brim of the *amphora*. But this olive is not very agreeable in itſelf, but it is exceeding proper for thoſe pickles and ſauces which are uſed at more ſumptuous and plentiful tables; for, when occaſion requires, it is taken out of the *amphora*, and, when bruiſed, admits of any other ſeaſoning or pickle you ſhall pleaſe to join with it; and you may make it up any way you think proper. Nevertheleſs, moſt people cut the ſective leek and rue, with young parſley and mint, very ſmall together, and mix them with the bruiſed olives; then they add to them a little peppered vinegar, and a little more honey or honey-wine; and bedew them with green oil, and ſo cover them up together with a bundle of green parſley.

Some, with each *modius* of olives, gathered and pickled after this manner, mix three *heminæ* of ſalt; and, having added the ſeeds of the maſtich-tree to them, and ſpread fennel under them, fill up the *amphora*, as far as the neck, with olives; then they pour vinegar, that is not very ſharp, into it; and, when they have almoſt filled the *amphora*, they preſs down the berry with a ſtuffing of fennel; and then add more vinegar, till it come up to the very brim of the veſſel: afterwards, on the fortieth day, they pour out all the liquor, and mix three parts of muſt, ſodden into one half, or one third of the firſt quantity, with one part vinegar, and fill the *amphora* again. There is alſo that other way of pickling them, which is approved; *viz.* That, when the white *Pauſian* has been ripened with ſtrong brine, all the liquor be poured out, and the *amphora* filled again with two parts of muſt, and one of vinegar, mixed together. The *royal*, or the *orchita* olive may be alſo put up and preſerved in this pickle.

Some mix one part wine and two parts vinegar, and, with that liquor, make the *Pauſian* olives become ſo light, as to ſwim in the liquor (1); which if any have a mind to uſe by themſelves, they ſhall find them agreeable enough; although even theſe, when they come out of the brine, may be made up in any other manner, and joined with any other pickle or ſeaſoning whatſoever.——*Pauſian* olives,

(1) *Colymbades*. Theſe olives were ſo called, ἀπὸ τὸ κολυμβᾶν, becauſe they ſwim upon the brine wherewith they were pickled, as *Athenæus* ſays: they were alſo called διμάδες, from the brine wherewith they were prepared; and πλωτῖδες, from their ſwimming.

after

after they are diſcoloured, and before they grow ripe and mellow, are gathered with their ſtalks, and kept in the very beſt oil: this ſort, above all others, even a whole year after, have the taſte of freſh green olives. Some alſo, after they have taken them out of the oil, and ſprinkled them with bruiſed ſalt, ſerve them up for new olives.

There is alſo that kind of pickle, which is commonly made uſe of in the cities of *Greece*, and they call it *epityrum* (2); as ſoon as the *Pauſian*, or the large round olive, changes its colour from white, and becomes a little yellowiſh, they gather them off the trees by hand, when the weather is fair, and ſpread them in winnowing fans under a ſhade, for one day; and, if any pedicles or ſtalks, leaves or twigs, ſtick to them, they gather and pick them; the next day they ſift them, and ſhut them up in a new frail, and put them under the preſs, and preſs them very ſtrongly, that they may exſude all the lees they have in them. But we ſuffer ſometimes the berry to continue one whole night and the next day under the preſs, and to be preſſed with the weight, and emptied, as it were, of all its filth and corruption; then, when the thin rind is broken and opened, we take it out of the preſs; and, upon each *modius* of olives, we pour a ſingle *ſextarius*, of bruiſed toaſted ſalt; alſo we mix maſtich-ſeed with them, and fennel- and rue-leaves dried under a ſhade, after they ſeem to be cut ſmall enough; and we let them ſtand three hours, till the berry, in ſome meaſure, drink up the ſalt. Then we pour oil of a good taſte upon them, ſo that it may cover the olive; and we preſs down a bundle of dry fennel upon them, ſo that the liquor may ſwim above them. But, for this ſort of pickle, new earthen veſſels, without any pitch, are prepared; and, that they may not ſip up the oil, they are ſoaked with melted tallow, or the like, as oil-jars are; and then afterwards they are dried.

(2) *Epityrum*. Some think, that this kind of preparation was ſo called from πίτυρον, which ſignifies *bran*, or the ſmall ſkins which come off the wheat in grinding; and theſe olives were called πιτυρίδες, becauſe they were thus bruiſed like bran: but this account of them is not very ſatisfying. Some conjecture it was ſo called, becauſe it was ſerved up with cheeſe, *quaſi* ἐπὶ τῷ τυρῷ, which ſeems more probable.

CHAP. XLVIII.

Of the Way to pickle black Olives.

BUT after this comes the cold of Winter, during which the gathering of the olives, and the making of the oil, call again for the care of the Bailiff's Wife, as the vintage did before. We ſhall therefore, in the firſt place, (ſince we have already begun it) give directions about pickling of olives, and preſently after ſubjoin an account of the method of making oil. They prepare the *Pauſian* or the *Orchitan* olives, and, in ſome countries, the *Nævian* alſo, for great banquets and feaſts: therefore it is proper, when the weather is fair, to gather theſe off the trees by hand, as ſoon as they are grown black, but are not as yet throughly ripe; and to pick and ſift them, and put apart ſuch of them as ſhall ſeem ſpotted or ſpoiled, and of a leſſer growth: then to every *modius* of olives to put three *heminæ* of unbruiſed ſalt, and to pour them together into willow-baſkets, and put plenty of ſalt upon them, ſo that it may cover the olives, and ſo leave them to ſweat together for thirty days, and drop out all their lees; afterwards to pour them out into a tub or tray, and, with a clean ſponge, wipe off all the ſalt, ſo as none of it may remain upon them; then to put them into a veſſel, and fill up the *amphora* with muſt ſodden in to one half, or one third of its firſt quantity; and put a ſtuffing of dry fennel upon them, to preſs down the olives. Nevertheleſs, moſt people mix three parts of muſt boiled in to one third of its firſt quantity, and one part of vinegar. Some mix two parts of muſt and one of vinegar, and pickle them with this liquor.

Some, when they have gathered the black olives, ſalt them with the ſame quantity of ſalt as above, and ſo place them in baſkets, that, after they have mixed maſtich-ſeeds with them, they may make one layer of olives, and another of ſalt by turns, till they come to the top; then, after forty days, when the olives have exſuded all the lees they had in them, they pour them out into a tray or trough; and, having ſifted them, they ſeparate them from the maſtich-ſeeds, and wipe them with a ſponge, that none of the ſalt may ſtick to them; then they throw them into an *amphora*, and add to them muſt boiled in to one third, or one half of its firſt quantity, or even honey, if they have plenty of it.

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To every *modius* of olives muſt be added one *ſextarius* of ripe aniſe- and maſtich-ſeeds, and three *cyathi* of fennel-ſeed; and if you have not this, the fennel itſelf cut ſmall, as much as ſhall ſeem ſufficient; and, with every *modius* of olives, three *heminæ* of toaſted ſalt, but not ground, muſt be mixed; and ſo they muſt be put up in *amphors*, and theſe muſt be ſtopped cloſe up with bundles of fennel, and daily rolled up and down upon the ground; and then every third or fourth day, whatever lees may be in them, muſt be let out. After forty days, the olives muſt be poured into a trough, and only ſeparated from the ſalt; but let them not be wiped with a ſponge, but put up into the *amphor* juſt as they are taken out of it, with ſmall lumps of ſalt mixed with them; and, after you have put ſtuffings upon them to keep them cloſe, let them be laid up in the cellar for uſe.

The olive which was gathered when it was ripe, and which, by lying in the brine, is become light, and ſwims above the liquor, take out of the brine, and wipe it with a ſponge; then cut it in two or three places with a green reed, and keep it three days in vinegar; the fourth day wipe it clean with a ſponge, and put it up into a new pot or jar, after you have ſpread parſley and a little rue under it. Then, when the veſſel is full of the cut olives, put muſt boiled in to one third of its firſt quantity into it, till it come to the mouth of the veſſel; put the tender tops of young branches of laurel upon the olives that are pickled after this manner, to preſs them down: after twenty days make uſe of them.

CHAP. XLIX.

How a Marmelad of Olives may be made.

THEY gather black olives exceeding ripe, when the weather is fair; and ſpread them upon reeds for one day, under a ſhade, and ſeparate all the damaged berries from them. Alſo, if there be any pedicles or ſtalks ſticking to them, they take them away, and take out from among them all the leaves and twigs that are mixed with them: the next day they ſift them carefully, that, if there be any dirt among them, it may be ſeparated from them; then the unbruiſed olive is ſhut up in a new frail, and put under the preſs, that it may be squeezed the whole night. The day following they throw

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it into a very clean ſuſpended mill, that its kernel may not be broken: and, when they are reduced to a maſh, then with their hand they mix with them toaſted and bruiſed ſalt, with the other dry ſeaſonings; and theſe are fenugreek, cumin, fennel-ſeed, and *Egyptian* aniſe-ſeed. But it will be ſufficient to put as many *heminæ* of ſalt to them, as there are *modii* of olives; and to pour oil upon them, leſt they wither; and that ought to be done as often as they ſhall ſeem to be dried.

Nor is there any doubt but the marmelad, which is made of the *Pauſian* olive, has the beſt taſte; but its taſte does not continue ſound above two months: but other kinds of olives, ſuch as the *Licinian* and *Culminian*, are fitter for this thing. Nevertheleſs the *Calabrian* olive-tree, which ſome call the *wild-ſhrub olive*, becauſe of its likeneſs to it, is reckoned the beſt for theſe uſes.

CHAP. L.

After what Manner Oil may be made.

THE beginning of *December*, for the moſt part, is the middle ſeaſon for gathering of olives, and making oil; for, before this time, the bitter oil, which is called *Summer-oil*, is made; and about this month they preſs the green oil, then afterwards the ripe oil. But it is not for the intereſt of a Maſter of a family to make bitter oil, becauſe the olives yield but very little of it, except the berry fall to the ground by tempeſtuous weather, and it be neceſſary to gather it up, leſt it be eaten up and deſtroyed by tame cattle or wild beaſts. But it is of very great advantage to him to make of the green ſort, becauſe the olives both yield enough of it, and by its price it almoſt doubles the income of the Owner: but, if the olive-yards are very large, it is neceſſary, that ſome part of them be reſerved for ripe fruit.

But the place, wherein the oil ought to be made, has been already deſcribed in the firſt book; nevertheleſs there are a few things relating to this affair, which I had before omitted, which muſt be mentioned. A loft to carry the olives into is very neceſſary, though we have already given directions, that the fruit, of every day's gathering, be preſently put under the millſtones and the preſs. Nevertheleſs, becauſe ſometimes the immoderate multitude of berries overcomes the labour of them that attend the preſs, and are more than they can manage, there muſt

muſt be a ſtore-room in the upper-part of the houſe, where the fruits may be put: and this loft ought to be like a granary, and to have as many ſmall bings, or diſtinct partitions, as the quantity of olives ſhall require, that ſo the gathering of each day may be put apart, and laid up by itſelf.

The floor or bottom of theſe ſmall partitions muſt be paved with ſtone or tiles, and made ſo ſloping, that all the moiſture may run quickly out of them by gutters or pipes; for the lees are very hurtful to the oil, which, if they remain in the berry, corrupt and ſpoil the taſte of the oil. Therefore, when you have built the partitions in the manner we have ſaid, place upon the floor ſmall boards, half a foot diſtant from each other; and lay reeds upon them, that are carefully and cloſely woven, ſo that they may not let ſo much as a berry paſs through, and be able to ſupport the weight of the olives. But hard by all theſe ſmall partitions, in that part where the lees run out of them, under the very pipes, the floor muſt be concave, after the manner of little trenches; or there muſt be a hollow ſtone, wherein may ſtand whatever liquor ſhall flow out of them, and from whence it may be drawn out. Moreover you muſt have fats or barrels ready prepared within-doors, which may receive the lees of every kind of olives apart by themſelves, whether they be ſuch as flow from the olives pure without any mixture, or ſuch alſo as have received ſalt; for both of them are fit for many uſes.

But mills are more uſeful than the *preſs*, for the making of oil; and the *preſs* than the *canalis*, and the *ſolea* (1). The mills are very eaſily managed; for, according to the bigneſs of the berries, the mill-ſtones may be either lowered or raiſed, that ſo the kernel, which ſpoils the taſte of the oil, may not be broken: moreover, the *preſs* diſpatches more work, and more eaſily, than the *ſolea* and *canalis*. There is alſo a machine like an erect threſhing inſtrument, which is called a *beetle*; and that does the work not incommodiouſly, except that it is frequently ſpoiled, and out of order; and, if you throw a

(1) *Columella* mentions here ſeveral machines, wherewith the oil was ſqueezed out of the olive-berries; but gives no particular deſcription of any of them, ſo that it is not eaſy to form any diſtinct idea of them. *Cato* indeed, in his 22d chapter, gives a particular deſcription of the *trapetum*: but it is not very intelligible, perhaps becauſe of the incorrectneſs of the text; and learned men differ in their opinions about it. *Varro* ſays, that the *trapeta* were oil-mills made of hard rough ſtones; and *Columella* ſeems to make the *mola* and the *trapetum* two diſtinct things: perhaps by the laſt he means a preſs for ſqueezing the olives, which had its name from the turning of the ſcrews. We have no account at all, that I can find, of the *canalis* and *ſolea*: nor is it any great ſatisfaction to be told by Antiquarians, that they were certain machines, uſed by the antients for making oil, ſince they give us no account of their ſtructure.

little

little too many berries into it, you ſtop it. Nevertheleſs, the foreſaid machines are made uſe of according to the ſtate, and condition, and cuſtom of the countries: but that of mills, as alſo of the turning preſs, is the beſt. I thought it neceſſary to premiſe theſe things, before I diſcourſed of making the oil.

Now we muſt come to the thing itſelf, altho' we have omitted many things, which, as before the vintage, ſo, before the gathering of the olives, and making the oil, muſt be all ready prepared; ſuch as plenty of wood, which muſt be brought home a long time before, that ſo, when the thing is wanted, the Labourers may not be called away from their buſineſs: ladders alſo, ſmall baſkets, and ſowers baſkets, of ten *modii* and three *modii* each, wherein the berries, which are gathered off the trees, are received; frails, hempen- and *Spaniſh*-broom-ropes, iron-ladles, wherewith the oil is emptied from one veſſel to another; covers or lids, wherewith the oil-veſſels are covered; ſponges, greater and ſmaller; pitchers, in which the oil is carried out; cane- or reed-mats, into which the olives are gathered; and, if there are any other things which now eſcape my memory. All theſe ought to be in great number, becauſe they periſh with the uſing, and become fewer; of which if any one thing be wanting, when there is occaſion to uſe it, the work is at a ſtand. But now I ſhall perform what I promiſed.

As ſoon as the berries ſhall begin to be of different colours, and ſome of them are already black, yet more of them white, the olive muſt be gathered by hand, when the weather is fair, and ſifted and cleanſed upon mats or reeds ſpread under them: then, after they are cleanſed, they muſt be preſently carried to the place where the preſſes ſtand, and ſhut up intire in new frails, and put under the preſſes, that they may be ſqueezed as little a while as can be. Afterward, when their thin rinds are opened, they ought to be ſoftened, by adding two *ſextarii* of whole ſalt to each *modius* of olives; and the maſs of bruiſed olives ought to be ſqueezed out, either in oblong ſquare boards, if it be the cuſtom of the country, or in new frails at leaſt: then that which ſhall firſt flow from the preſs into a round vat, (for that is better than a ſquare leaden veſſel, or a receiver made of ſtone or brick, with two diviſions in it) let the Lader empty it preſently, and pour it into great earthen pans prepared for this uſe.

But, in the oil-cellar, let there be three rows of pans, that one of them may receive the oil of the firſt note, that is, of the firſt preſſing; the ſecond, that of the ſecond; and the third row, that of the

third; for it is of great importance not to mix that of the ſecond, and much leſs that of the third preſſing, with that of the firſt; becauſe that is of a much better taſte which flows from the olives with leaſt force of the preſs, as if it dropped from them of its own accord. When therefore the oil has ſtood a little in the firſt pans, the Lader ought to ſtrain and empty it into the ſecond, and then into the next, till he come to the laſt; for the oftener it is ventilated, and worked, as it were, by emptying it from one veſſel into another, the clearer it becomes, and the more it is freed from its dregs. But it will be ſufficient to place thirty large pans in each row, except the olive-yards be very large, and require a greater number.

But if, with the colds, the oil ſhall be congealed with the lees, you muſt, in that caſe, certainly uſe a little more toaſted ſalt; that thing reſolves and looſens the oil, and ſeparates it from every thing that may hurt or corrupt it. Nor is there any reaſon to fear, that the oil will become ſalt or brackiſh; for, whatever quantity of ſalt you ſhall put to it, yet the oil does not receive the taſte of it. But, even thus the oil uſually does not diſſolve, when greater colds than ordinary come on ſuddenly; therefore they toaſt nitre, and bruiſe it and ſprinkle it upon the oil, and mix it with it: this liquifies the lees. There are ſome, tho' very careful Oilmen, who do not put the berry under the preſs whole, without breaking it, becauſe they think, that ſome part of the oil is loſt by ſo doing; for, when the berry receives the weight of the preſs, the lees alone are not preſſed out of it, but they attract ſomething of the fatneſs *of the oil* with themſelves.

But I have this direction to give you upon the whole, That neither ſmoak nor ſoot be admitted into the place where the oil-preſs ſtands, or into the oil-cellar, as long as the green oil is making there; for both theſe are very prejudicial to this affair, and the ſkilfulleſt Oilmen ſcarcely ſuffer their work to be done at the light of one ſingle lamp; wherefore both the place where the oil-preſs ſtands, and the oil-cellar, muſt be ſituated towards that quarter of the heavens which is moſt ſheltered from cold winds, becauſe the heat of the fire is not at all required. Moreover, the barrels and jars, into which the oil is put, muſt not only be carefully cleanſed, and put in order, at the time when the neceſſity of beſtowing the fruit forces to do it, but, when they are emptied by the Merchant, the Bailiff's Wife ought preſently to take care, that, if any dregs or lees have fallen to the bottom of the veſſels, they be immediately cleaned out, and waſhed with a lye of aſhes, not very hot, leſt the veſſels throw off and loſe their wax; and let it be done once and again: then let them be gently rubbed

with the hand with lukewarm water, and often rinſed, and ſo let all the moiſture be dried up with a ſponge.

There are ſome who diſſolve potters-clay in water like liquid dregs, and, after they have waſhed the veſſels, daub them on the inſide with this ſort of gruel, as you may call it, and ſuffer it to dry upon them: afterwards, when they have occaſion to uſe them, they rinſe them with pure water. Some waſh the veſſels throughly all over with lees of oil firſt; then they waſh them with water, and dry them: then they examine whether the barrels want new wax; for the antients ſaid, that it was neceſſary to wax them almoſt every ſixth year, at the time of making the oil, which I do not underſtand how it can be done: for, as new veſſels, if they be heated, eaſily receive the melted wax, ſo I cannot believe, that ſuch as are old will bear waxing, becauſe of the juice of the oil; which very waxing, nevertheleſs, the Huſbandmen of our times have wholly laid aſide, and have been of opinion, that it was better to waſh the new barrels all over with liquid gum, and to ſuffumigate them with white wax when they are dried, that they may not loſe their good colour, and tarniſh: and they judge, that this fumigation ought to be done, as often as either the new or old veſſels are cured and ſeaſoned, and prepared for the new oil. Many, when they have daubed their new barrels or jars with groſs fat gum, are ſatisfied with one gumming for ever: and, indeed, a veſſel which has once imbibed the oil, does not admit of a ſecond gumming; for the fatneſs of the oil refuſes any ſuch matter as that of gum is.

After the month of *December*, about the beginning of *January*, the olive-berry muſt be gathered in the ſame manner as above, and the oil preſently preſſed out of it; for, if it be laid up in a loft, it quickly grows hot; for, with the Winter-rains, it breeds a greater quantity of lees, which are very hurtful to oil. Therefore, you muſt beware of making oil for eating of this kind of berry, which may, by this one way, be avoided; if, as ſoon as the berry is brought out of the field, it be ground, and put into the preſs, and the oil preſſed out of it, and managed, as we have ſaid above. All Huſbandmen, for the moſt part, have believed, that, if the berry be laid up within the houſe, the oil will grow in the loft; which is as falſe, as that corn of any ſort grows in the threſhing-floor: and this falſhood that antient author, *Porcius Cato*, refutes thus; for he ſays, that the olive grows wrinkled in the loft, and becomes ſmaller: for which reaſon, when the Huſbandman has laid up ſuch a quantity in the houſe, as is ſufficient for one making; and, after many days, has a mind to grind

grind it, having forgotten the firſt quantity that he had brought in, he ſupplies out of another heap, which he had in like manner placed apart by itſelf, as much as is wanting to each quantity; and, by this one making, the berry, that has reſted for ſome time, ſeems to yield more oil than that which is freſh, and newly gathered, whereas he has taken many more *modii* of olives to it. Yet, ſuppoſe that were exceeding true, nevertheleſs there is more money raiſed by the price of green freſh oil, than by the great quantity of that which is bad: which thing *Cato* alſo ſaid. And thus, indeed, whatever addition of weight or meaſure is made to the oil, if you would compute the quantity of berries, added to that which you reckoned to one making, you would think it not an increaſe and advantage, but a real loſs: wherefore we ought not to heſitate to grind the olives, and put them under the preſs, as ſoon as poſſible, after we have gathered them.

Nor am I ignorant, that a ſecondary oil, for common eating, muſt alſo be made; for, when the olive, which is gnawed by the little worms, falls off the tree, or has, by ſtorms and rains, fallen into the dirt, they have recourſe to warm water for a remedy; and the caldron ought to be made hot, that the dirty berries may be waſhed. But this muſt not be done with exceeding hot water, but with that which is moderately warm, that the taſte of the oil may become the more agreeable; for, if the agreeable taſte be boiled out of it, it attracts the taſte of the little worms, and of any other ſorts of naſtineſs whatſoever: but, when the olive has been throughly waſhed, the other things ought to be done, as I directed above. But the pureſt and beſt oil, and that of the ſecondary ſort for common uſe, muſt not be preſſed in the ſame frails; for old frails ought to be ſet apart for ſuch olives as fall off the trees of their own accord; and thoſe that are new, for the oil of the firſt note; and, when they have ſerved for preſſing out the oil of every particular making, they ought always to be preſently waſhed, twice or thrice, in exceeding hot water: then, if there be any brook, or running water, they muſt be ſunk in it by having ſtones put into them, that they may be preſſed down and detained by the weight thereof: or, if there be no river, they ought to be ſoaked in a lake, or pond, of the pureſt water you can find, and afterwards beaten with rods, that the dirt and dregs may fall off them, and then they muſt be waſhed a ſecond time, and dried.

CHAP. LI.

Of Gleucine *Oil* (1).

ALthough the compoſition of *Gleucine* oil does not belong to this ſeaſon of the year, nevertheleſs it is reſerved for this part of the book, leſt it ſhould be inſerted not very properly among the rules laid down for making wine; but it ought to be made in this manner: You muſt prepare an oil-veſſel, of the largeſt ſize, either new, or, at leaſt, very ſound and ſtrong; then, in the time of vintage, you muſt pour into it, and mingle together, ſixty *ſextarii* of the very freſheſt and of the beſt kind of muſt, with eighty pound-weight of oil; then you muſt put ſpices that are not ſifted, yea, not ſo much as bruiſed ſmall, but ſlightly broken, into a ſmall ruſh- or flaxen-net, and let them down with the ſmall weight of a ſtone, into a part of the muſt and oil: but, let the ſpices be weighed in the proportions we have here ſubjoined; of *calamus*, *ſweet-ſmelling ruſh*, *cardamom*, the wood of the *balſam-tree*, *palm-tree-bark*, *fenugreek* ſteeped in old wine, and afterward dried, and alſo toaſted; *bulruſh-root*, as alſo *Greek flower-de-luce*, and *Egyptian aniſe*, of equal weight; that is, of each one pound and a quarter, as we ſaid above: ſhut them up in a ſmall net, and let them down into the muſt and oil, and daub the firkin or jar: after the ſeventh or the ninth day, if any dregs or filth ſhall ſtick by itſelf to the chops of the jar, take it away with your hand, and wipe it; then ſtrain off the oil, and put it up in new veſſels.

Preſently after take out the ſmall net, and bruiſe the ſpices, as clean as poſſible, in a mortar; when you have bruiſed them, put them again into the ſame jar, and pour in as much oil as you did at firſt, and ſtop it up, and place it in the Sun: after the ſeventh day decant the oil; and what remains of the muſt, put it up in a pitched barrel: and, if you do not conſume all this medicament, you ſhall give it to weak oxen, and the reſt of the cattle, to drink. But this ſecondary oil, which is not of a diſagreeable ſmell, may ſerve for a daily ointment for ſuch as are affected with a pain of the nerves.

(1) *Oleum gleucinum* was a compoſition made of oil and muſt: this laſt the *Greeks* called γλεῦκος, which, being mixed with the oil, gave it this denomination.

CHAP.

CHAP. LII.

After what Manner you may make Oil for Ointments.

MAKE oil for ointments thus: Before the olive-berry grows black, when it firſt begins to be diſcoloured, but not as yet ſpotted, and of various colours, gather by hand the *Licinian* eſpecially, if you have any; if not, the *royal*; if you have not this neither, then the *Culminian berry*; and, when you have cleanſed it, put it preſently under the preſs whole, and ſqueeze the lees out of it; then break the olive in a ſuſpended mill, and put it either into frames made of oblong ſquare pieces of wood, or a new large frail; and, having put it under the preſs, preſs it in ſuch a manner, as you may not writhe the veſſels, but only ſuffer it to be ſqueezed as little as can be, with the weight of the preſs. Then, when the oil has flowed from them in this manner, let the Lader ſeparate it forthwith from the lees, and remove it into new pans, apart by itſelf, till it grow clear. The reſt of the oil, that ſhall be ſqueezed out afterward, may be approved for food, either when it is mixed with that of another ſort, or by itſelf.

CHAP. LIII.

Of ſalting of Swine's Fleſh.

THUS far we have ſaid enough of oil; now let us return to leſſer things. You muſt reſtrain all kinds of cattle, and eſpecially ſwine, from drinking, the day before they are killed, that their fleſh may be the drier; for, if they drink, their fleſh, when it is ſalted, will have the more water in it: therefore, having killed them when they are thirſty, bone them well; for this makes the ſalted fleſh leſs liable to corrupt, and more durable: then, after you have boned it, ſalt it carefully with toaſted ſalt, which is not too ſmall, but broken in a ſuſpended mill; and ſtuff in a large quantity of ſalt, into thoſe parts eſpecially, wherein the bones are left; and, having laid the flitches or pieces in due order, upon boards, place huge weights upon them, that the blood may be preſſed out of them. The third day remove

remove the weights, and rub the ſalted fleſh carefully with your hands; and, when you have a mind to put it into the ſame place again, ſprinkle it with ſmall bruiſed ſalt, and ſo replace it: nor ſhall you ceaſe to rub the ſalt daily into it, till it be completely ſalted; but, if it be fair and clear weather, during theſe days, wherein the fleſh is rubbed with ſalt, you ſhall let it lie in the ſalt nine days; but, if it be cloudy weather, or rain, the ſalted fleſh muſt be carried to a pond on the eleventh or twelfth day, and the ſalt firſt ſhaken off it; then it muſt be carefully waſhed with freſh ſweet water, and let not the ſalt ſtick any-where upon it; and, when it is dried a little, it muſt be hung up in the larder, where a moderate ſmoak may come, which may dry it, if there be any water as yet contained in it. The proper time for ſalting fleſh after this manner, will be when the Moon is in her wane, eſpecially about the middle of Winter, and alſo in the month of *February*, before the thirteenth day.

There is another way of ſalting fleſh, which may be put in practice even in hot countries, at all times of the year; and it is ſuch as this: When the ſwine are kept from water the day before, they are killed the day following; and they take off their hair, either with ſcalding hot water, or with a ſmall flame of bruſhwood (for their hair is pulled off both ways). They cut their fleſh into pieces of a pound-weight; then they ſpread toaſted ſalt in the bottom of a barrel or tub, but moderately bruiſed (as we ſaid above); then they lay the ſmall pieces of fleſh very cloſe to one another, and in good order; and throw in ſalt by turns: but, when they come almoſt to the brim of the barrel, they fill the reſt of it with ſalt, and preſs it down into the barrel with weights laid upon it: and this fleſh is always preſerved and kept without ſpoiling, and remains in its own brine, as any other ſalted thing whatſoever.

CHAP. LIV.

After what Manner you may pickle Turneps and Navews.

TAKE the roundeſt turneps you can find, and wipe them, if they be dirty; and, with a ſharp knife, pare off the outer ſkin; then (as the Oilmen uſe to do) make an inciſion upon them croſs-wiſe, with an iron-tool in form of a creſcent: but beware you do not cut the turnep through to the bottom. Then ſprinkle ſalt, that

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is not too ſmall, between the inciſions of the turneps, and lay them in order in a tray or tub; and, having ſprinkled them with a little more ſalt, let them alone for three days, till they exſude their moiſture. After the third day, taſte the middle fibre of the turnep, if it has taken the ſalt; then, when it ſhall ſeem to have taken enough of it, after you have taken them all out, waſh them, one by one, in their own liquor; or, if there be not much liquor, put ſtrong brine to it, and ſo waſh them: then put up the turneps into a ſquare willow cheſt, which is not woven too cloſely, but yet very firmly, with large willows; then put a board upon them, ſo fitted, that it may be preſſed down within the cheſt to the very bottom, if there be occaſion for it: and, after you have thus fitted the board, put heavy weights upon it, and let them dry one whole night and a day; then put them up in a pitched earthen jar, or in a large glaſs bottle; and ſo pour in muſtard and vinegar, that they may be covered with liquor.

Navews alſo may be pickled with the ſame liquor as turneps; but, if they be ſmall, they muſt be pickled whole; if large, they muſt be cut. But you muſt take care, that both theſe be pickled, and put up, while they are young and tender, before they form their ſtalk, or put forth any ſprouts or ſhoots. Throw the ſmall navews into the veſſel whole, and the large ones divided into three or four parts, and infuſe them in vinegar; and alſo put one *ſextarius* of toaſted ſalt into a *congius* of vinegar. After the thirtieth day you may uſe them.

CHAP. LV.

How you may make Muſtard.

CLEANSE and ſift muſtard-ſeed carefully; then waſh it with cold water; and, when it has been well-waſhed, let it lie two hours in water; afterwards take it out; and, having ſqueezed the water out of it with your hands, throw it into a new mortar, or into one that is made very clean, and bruiſe it ſmall with peſtils: when you have bruiſed it, draw the whole maſh together to the middle of the mortar, and preſs it down with your flat open hand; and, after you have compreſſed it, ſcarify it; and, having placed a few live coals upon it, pour nitred water upon it, that it may free it from all its bitterneſs and paleneſs; then raiſe the mortar, that all the moiſture may be drained out of it; after this put white ſharp vinegar to it,

and mix it throughly with the peſtil, and ſtrain it: this liquor does exceeding well for pickling of turneps. But, if you would prepare muſtard for the uſe of great entertainments, when you have ſqueezed all the noxious juice of it, add the freſheſt pine-apples you can find, and almonds to it; and bruiſe them carefully together, and pour in vinegar upon them: do the other things as I ſaid above. When you come to uſe this muſtard, it will not only be very fit for ſawce, but very beautiful and pleaſing to the eye; for it is of an exquiſite whiteneſs, if it be made with care.

CHAP. LVI.

After what Manner you may preſerve and pickle the Aliſſander- *and the* Skirret-*Roots.*

BEFORE the aliſſander puts forth its ſtalk, take its root out of the ground in the month of *January*, or even in *February*; and rub it carefully, that nothing of earth may ſtick to it, and lay it in vinegar and ſalt; then, after the thirtieth day, take it out, and pare the bark off it, and throw it away: but, having cut the heart of it into ſmall pieces, put them up into a ſmall glaſs bottle, or a new earthen pot; and put liquor to them, which ought to be made as is directed below: Take mint and raiſins of the Sun, and a ſmall dry onion; and bruiſe it ſmall with parched red-bearded wheat, and a little honey; and, when it is well bruiſed, mix with it two parts of muſt boiled in to one half, or a third part of its firſt quantity, and one part vinegar; and ſo pour them all together into the ſame earthen pot, and, having put its cover cloſe upon it, cover it over with leather: then, when you have a mind to uſe it, bring out the ſmall roots, that are cut into pieces, with their own liquor, and put oil to them. At this very time you may pickle the ſkirret-root, in the ſame manner as above; but, when you ſhall have occaſion to uſe it, you ſhall take it out of the jar, and pour oxymel, with a little oil, upon it.

CHAP.

CHAP. LVII.

How to make up a Sallet of eaſy and quick Digeſtion (1); *or, as others will have it, a Sallet or Sawce with a Mixture of* Garum *and Vinegar.*

PUT into a mortar ſavory, mint, rue, coriander, parſley, the ſective leek, or, if you have none, a green onion, the leaves of lettuce and of rocket, green thyme, or cat-mint, as alſo green penny-royal, and ſalted new-cheeſe; bruiſe all theſe equally together, and mix a little peppered vinegar with them: when you have made up all this mixture together, in a ſmall diſh, pour oil upon it. When you have bruiſed the foreſaid greens all together, join with them as many well-cleanſed walnuts as you ſhall think ſufficient; and mix a little peppered vinegar throughly with them, and pour oil upon them: bruiſe ſeſamum, ſlightly parched, with theſe greens above-mentioned: alſo mix a little peppered vinegar with them, upon which pour a little oil.

Cut *Gallican* cheeſe, or of any other ſort whatſoever, very ſmall, and bruiſe it, and the kernels of pine-apples, if you have plenty of them, if not, toaſted filberts, after you have taken off their ſkin, or almonds; and mix them in equal quantities upon the foreſaid ſeaſoning herbs; and add a little peppered vinegar to them, and mix them throughly; and pour oil upon the whole compoſition,

If you have none of theſe green ſeaſoning- or ſallet-herbs, bruiſe dry penyroyal, or thyme, or marjoram, or dry ſavory, with cheeſe, all together, and put peppered vinegar and oil to them. Nevertheleſs, any one of theſe herbs, when they are dry, if you have not the reſt, may alſo by itſelf be mixed with cheeſe.---Take of white pepper, if you have any, if not, of black pepper, three ounces; of parſley-ſeed, two ounces; of laſer-root, which the *Greeks* call *ſilphium*, an ounce and an half; of cheeſe, two ounces; after you have bruiſed

(1) *Moretum* may ſignify any kind of haſh, and is the ſame as τεῖμμα, or *intritum*: it was commonly made up of different ſorts of herbs, and ſome other ingredients, and diverſified according to every one's fancy, by the addition of ſomething new, as we ſee in this chapter. It is called here *moretum oxyporum*, either becauſe it was of itſelf of eaſy and quick digeſtion, or contributed to the quick digeſtion of other things, and ſo may be tranſlated, *a ſallet or ſawce of quick digeſtion*, or *that paſſeth eaſily*, as oppoſed to βεαδύπεπτον, which paſſeth with difficulty. When it had *garum* and *vinegar* mixed with it, they called it *moretum oxygarum*.

and ſifted them, mix them with honey, and keep them in a new pot: then, when you ſhall have occaſion to uſe them, dilute what quantity you ſhall think proper with vinegar, and *garum*.----Take an ounce of lovage, two ounces of raiſins of the Sun, after you have taken out their ſtones; three ounces of black or white pepper: theſe, if you avoid greater expences, you may mix throughly with honey, and ſo keep them. But, if you have a mind to make a more coſtly and valuable ſallet, for eaſy and quick digeſtion, you ſhall mix theſe ſame things with the compoſition above-deſcribed, and ſo lay it up for uſe. But alſo, if you have no laſer, inſtead of the *ſilphium*, you ſhall put half an ounce of honey to it.

I do not think it improper, *Publius Silvinus*, as a concluſion of the work I have finiſhed, to declare to my Readers, (if ſo be there ſhall be any who may vouchſafe to take cognizance of theſe things) that I did not at all doubt, that there are things almoſt infinite, which might have been ingrafted into this ſubject; but that I judged it proper to publiſh only ſuch as ſeemed the moſt neceſſary. However, Nature has not beſtowed, even upon grey hairs, knowledge and prudence in all things; for, even whoſoever have been eſteemed the wiſeſt of mortals, are ſaid to have known many things, but not all.

L. JUNIUS MODERATUS COLUMELLA,

HIS

BOOK

OF

TREES (1).

FOraſmuch as we ſeem to have given abundance of precepts in the firſt book, concerning the culture of lands; the care of trees and ſhrubs, which is even reckoned the greateſt part of Huſbandry, will not now be unſeaſonable. Therefore we alſo think it proper, as *Virgil* did, to diſtinguiſh plants of trees into two kinds; one of which grows up of its own accord, the other proceeds from human induſtry and care. That kind, which does not come forth by human aſſiſtance, is more proper for timber: this, upon which labour is

(1) In all, or moſt of the oldeſt editions of *Columella*, this ſmall treatiſe upon trees was placed as the third book of his ſyſtem of Agriculture: but learned men, who had carefully conſidered this work, ſoon found, that this ſmall book made no part of it; therefore *Aldus*, and other learned Editors after him, threw it out of the place wherein it had been inconſiderately placed, and printed it ſeparately by itſelf. There are many reaſons which may convince any attentive perſon, that this book is not at all a part of that work inſcribed by *Columella* to *Publius Silvinus*, but a part of a different treatiſe; for the very beginning of that book, which, by inſerting this, was diſpoſſeſſed of its rank, and placed as the fourth in order, proves, that not *this book of trees*, but one, which treats of the culture of land, did immediately precede: for the author ſays, *Hitherto we have treated of the culture of land; now follows the care of trees:* and it cannot be ſuppoſed, that, if he had treated of trees in the book immediately preceding, he would have ſaid in the next following, *that he then began to treat of that ſubject:* and it would be an inexcuſable want of method, diligence, and attention, in an author, if, after having treated of ſeveral things in a preceding book, he ſhould treat of the ſame things over again, and in the ſame words, in the very next book; which would be exactly the caſe, if this book were reckoned the *third* in *Columella*'s ſyſtem of Husbandry: moreover, by ſo doing, the whole order and numbers of the books, mentioned by *Columella* himſelf in ſeveral places, would be inverted, and really different from what he himſelf affirms it to be; and when he ſays, in the beginning of the eighth book, that he had finiſhed ſuch and ſuch things in *ſeven books*, he ought to have ſaid *eight*, and that which he calls his *eleventh*, he ought to have called the *twelfth*; and in ſeveral other inſtances, which it is needleſs to mention. It is alſo to be obſerved, that in all the other books he mentions *Silvinus*, but in this there is no mention of him at all: from all which it is reaſonable to think, that this book is the ſecond of two, which he formerly wrote upon Husbandry, as appears by the very firſt ſentence; and that the firſt, which treated of the culture of the ground, is loſt, and this other, concerning trees, has been preſerved. And it ſeems very probable, that theſe

is beſtowed, is fit for fruit; therefore this one is the chief: and this kind itſelf is divided into three different ſorts; for, from a young plant, ſlip, or ſhoot, either a *tree* ariſes, as the *olive-tree*, the *fig-tree*; or a *ſhrub*, as *roſe-buſhes*, *reeds*; or a certain third thing, which we cannot properly call either a tree, or a ſhrub, as is the *vine*: we ſhall teach you the culture of trees and ſhrubs, when we ſhall have firſt given precepts and directions concerning vines.

Whoever ſhall have a mind to plant a vineyard, or to make a plantation of trees for the ſupporting of vines, ought firſt to make nurſeries; for then he will know what kind of vine he is about to plant; for that which is purchaſed with money, and is ſet in its place, has no certain characters of excellency, and of noble qualities, to be depended on; becauſe it is doubtful, whether he who ſold it did uſe diligence in chooſing the plants: moreover, that which is brought from far diſtant parts, does not eaſily familiarize itſelf with our ſoil; for which reaſon, that which is foreign, and of a diſtant county, does, with greater difficulty, take root, and grow up. It is beſt therefore to make a nurſery in the ſame ground, where you are about to plant the vine, or, at leaſt, in the neighbourhood: and the nature of the place is of great importance with reſpect to this; for, if you are about to lay out your hills and riſing grounds in vineyards, and in plantations of trees for ſupporting vines, you muſt uſe this precaution, to make your nurſery in the drieſt place you can find; and that the vine may, from its infancy, as it were, accuſtom itſelf to little moiſture: otherwiſe, where you have tranſplanted it from a moiſt to a dry place, being deprived of its former nouriſhment, it will decay and fail. But, if you have champagne wet and ouſy lands in your poſſeſſion, it will be of advantage to make a nurſery alſo in a like place, and to accuſtom the vine to a large quantity of moiſture; for a ſlender dry vine, when tranſplanted into a watery ground, does certainly rot. But it will be ſufficient to turn up the plain, even, and juicy land itſelf, which you deſtinate for a nurſery, with that ſpade of two feet and an half, which Ruſtics call *ſeſtertium*. This repaſtination, or trenching and opening the ground for planting, has more depth than one foot and an half, but leſs than two feet: with this kind of ſpade, a *jugerum* of land is turned up, by fifty Labourers, in one day. But

were his firſt eſſays upon this ſubject, which, no doubt, being well received, his friends engaged him to reviſe and inlarge the ſame; ſo that having afterwards compoſed a new work, much more complete than the former upon the ſame ſubject, and added ſeveral other books, for the improvement of Husbandry and domeſtic œconomy, his firſt eſſay wa neglected as leſs perfect, and afterwards a part of it periſhed.

you

you may trench an hill or riſing ground, of the compaſs of one *jugerum*, with ſixty Labourers, if you do not trench it leſs than two feet deep: or, if you have a mind to make a nurſery in the ſame place, when you deſign to plant a regular vineyard, you may trench, or prepare for planting, a *jugerum* of ground, three feet deep, with eighty Labourers, in one day; provided nevertheleſs, that neither ſtone, nor gravel-ſtones, or other more difficult ſtuff intervene: in which caſe, how many Labourers it may require, is very uncertain. But we ſpeak of ground where there is nothing but earth.

CHAP. II.

What Sorts of Plants or Shoots you ought to gather; and when.

HAVING finiſhed the trenching or the digging of the ground, in the month of *February*, or in the firſt part of *March*, gather your plants: but thoſe are the beſt, which are gathered off vines that have been marked; for he that has it much at heart, to make good nurſeries, about the time of vintage, marks with ochre mixed with vinegar (that it may not be waſhed off by the rains) the vines which have brought to maturity fruit, that is both ſound and incorrupted, and in great quantity. And he does not do this only for one year, but he carefully views the ſame vines for three or more vintages ſucceſſively, to ſee whether they continue and perſevere to be fruitful; for ſo it is manifeſt, that the fruit proceeds from the generous qualities of the vines, and not from the plenty of the year.

If the vines keep the ſame conſtant courſe for ſeveral vintages, ſhoots gathered from ſuch vines as theſe will yield good wine, and in great quantity: for grapes, of whatever kind they may be, which come to maturity ſound, and without ſpoiling, make wine of a far better taſte, than ſuch as are eaſily damaged, or over-haſtily ripened by the great heat, or by any other cauſe.

CHAP. III.

After what Manner you may chooſe your Shoots; and of the Quality and Condition of the Ground.

BUT chuſe ſhoots *from vines* of a large berry, a thin huſk, few and ſmall grape-ſtones, and of a ſweet taſte. Thoſe gathered from the loins of the vine are reckoned the beſt; thoſe from the ſhoulders are next to them; and the third are thoſe gathered from the uppermoſt part of the vine, which very quickly take root and grow, and are more fertile than the others; but they likewiſe ſpeedily grow old. I do not approve the ſetting of ſhoots or ſprays, that grow out of the ſtock of the vine, becauſe they are barren.

In fat, and level, and moiſt places, plant the early-ripe vines, and ſuch as are weak, with thin berries, and ſhort joints; for this kind of land is fit for ſuch kind of vines. In thirſty, lean, and dry places, plant a vine that is naturally fertile and ſtrong, with the grapes cloſe and thick ſet: for, if you plant ſtrong vines in fat land, they will be the more luxuriant in ſhoots and leaves; and whatever ſort of fruit they bring forth, they will not bring it to maturity: on the other hand, vines that are weak will quickly fail and decay in poor, lean land, and will yield very little fruit. Plant every kind of vine apart by itſelf: ſo you will prune and gather the grapes of every ſort in its own proper ſeaſon.

Young ſhoots, planted with a piece of the old ſpray, ſoon take root, and grow ſtrongly; but they quickly grow old: but thoſe that are ſet without any part of the old branch, take root, and grow up more ſlowly; but then they fail, and decay more ſlowly. It is proper to commit the ſhoots to the earth, as freſh and newly gathered as poſſible: nevertheleſs, if any delay or hinderance ſhall happen, which may prevent their being planted preſently, they muſt be, as carefully as poſſible, covered all over with earth, in a place where they can feel neither winds nor rains. Make your nurſeries and plantations at the time of the New Moon, and about the tenth and the twentieth day. This is the beſt time for the planting of vines: but, when you plant, avoid cold winds.

Plant the *malleolus* or mallet-ſhoot in this manner: It is proper, that the mallet-ſhoot-rod ſhould not be of more than ſix eyes; provided nevertheleſs, that they have but ſhort ſpaces between the knots,

with a very ſharp bill cut off, with a round cut, the lower part of the ſhoot you are about to ſet in the ground, hard by the knob or joint, but ſo, that you may not hurt the eye; and preſently ſmear it over with ox's dung: then faſten the ſprig ſtraight into earth that has been well paſtinated and dunged, ſo that no leſs than four eyes of it be hid. It will be ſufficient, that the ſpace of one foot every way be left between the plants. When they have taken root, and grow well, let them be pampinated, or freed from their ſuperfluous twigs and leaves, that they may not nouriſh more twigs than they ought; alſo let them be digged as often as can be: let them not be touched with an iron-tool. In the twenty-fourth month let them be cut: after the thirty-ſixth month let them be tranſplanted.

Place your vineyard in land that has reſted and lain fallow; for where there has been a vineyard, whatever you plant ſooner than the tenth year will, with more difficulty, take root and grow, and will never recover ſtrength. Before you plant land with vines, examine carefully, and try what taſte it is of; for ſuch a taſte will it communicate to the wine. But the taſte of it (as we taught in the firſt book) will be perceived and found out, if you ſoak the earth in water; and, when you have ſtrained it, then you may taſte the water. Sandy earth, under which there is conſtantly a ſweet moiſture, is fitteſt for vines; land like to this, under which there are ſoft crumbling gravel-ſtones, is alſo very good: earth that is gathered together, and moved from any other place, is equally uſeful *for this purpoſe*. Gravel alſo, under which there lies ſweet white clay, or potters-earth, is proper for vines: but all land whatſoever, that cleaves and chaps during the Summer, is uſeleſs for vines and trees. The lower earth nouriſhes the vines and the tree, and that which is uppermoſt guards and preſerves them.

Rocks, upon the uppermoſt part of the earth, hurt both vines and trees; in the lower part they cool and refreſh them: and ground of a middling thinneſs is beſt for vines; but that which tranſmits, or preſently drinks up the ſhowers, or, on the other hand, retains them long upon its ſurface, muſt be avoided: but that which is tolerably thin on the upper part, and thick and cloſe about the roots, is the moſt uſeful and proper. On mountains, and riſing grounds, and ſides of hills, vineyards have difficulty to take firm root and grow; but they yield wine of a firm and excellent taſte. In moiſt, even, and level places, vineyards are exceeding ſtrong; but they produce wine of a weak flat taſte, and which does not keep long. And ſince we have given directions concerning the plants, and the quality and condition

dition of the ſoil, we ſhall now treat of the different kinds of vineyards.

CHAP. IV.

Of the ſeveral Kinds of Vineyards.

VINES rejoice moſt, and thrive beſt, on trees, becauſe they naturally tend aloft, and grow to a great height; alſo upon trees they produce more firm-wood, and larger boughs; and they throughly concoct their fruit, and ripen it equally. This kind of vines we call arbuſtive- or arbour-vines; of which we ſhall ſpeak at greater length in their due place. But, commonly, there are three kinds of vineyards in uſe: vineyards, where the vines grow upon frames; vineyards, where the vines lie at their full length upon the ground; and then a third ſort, where the vines grow upright from the ground, ſupporting and ſtanding by themſelves, after the manner of trees: this kind, compared with that which grows upon frames, has, in ſome things, the diſadvantage, and is inferior to it, and in other things excels it. A vineyard laid upon frames receives more air, and bears fruit higher, and concocts and ripens it more equally; but the culture of it is more difficult: but this, that grows upright, is ſo conſtituted, that it may be plowed alſo; and thereby attains to greater fruitfulneſs, becauſe it is oftener cultivated, and with leſs expences. But that which is immediately laid at its full length, and thrown flat upon the ground, produces much wine, but not of a good quality.

A vineyard is beſt planted in land that is well paſtinated or trenched: nevertheleſs, ſometimes vines are even better committed to furrows in ſome places; ſometimes alſo they ſet them in trenches; but, as I ſaid, a *jugerum* of ground may be paſtinated three feet deep, by eighty Labourers, in one day: but one Labourer digs a furrow in the earth two feet deep and ſeventy feet long, in one day. One Labourer makes eighteen three feet trenches, that is, three feet every way, in one day: or, if any body has a mind to plant the vines wider, and at a greater diſtance, from one another, one Labourer makes twelve trenches, four feet every way, in one day; or one Labourer digs twenty trenches, two feet every way, in one day. But you muſt take care, that the vines

vines be ſet deeper in places that are dry and ſloping, than in ſuch as are moiſt and level.

In a vineyard that is planted exceeding cloſe, they ſet the vines at the diſtance of five feet from each other; but, in ſuch vineyards as are planted wider, they put the ſpace of ſeven or eight feet between the vines; but in ſuch as are planted the thinneſt, (that they may be eaſily plowed alſo) they place the vines ten feet diſtant from each other. This way of planting a vineyard takes up, without doubt, a greater extent of ground; but the vines thrive the beſt, grow exceeding ſtrong, and become the moſt fruitful. When you ſet the plants, dig the bottom of the furrow or trench with hoes, and make it ſoft: ſee that the vine, which you plant, look towards the Eaſt when it is tied to the prop: in the bottom of the trench place ſtones about five pound-weight, ſo that they may not preſs upon the vine; but yet let them be hard by its roots. Moreover, after you have done theſe things, put an *hemina* of the huſks and ſtones of white grapes to the root of a black vine, and of black grapes to the root of a white vine, and ſo fill up the trench or furrow to the middle with dunged earth: then the next three years fill up the trench or the furrow gradually, till you fill it up to the top, ſo the vines will accuſtom themſelves to ſtrike their roots downwards. But the ſtones give room to the roots where they may creep and ſpread themſelves, and they repel the water in Winter; and the huſks of the grapes afford them moiſture in Summer, and force them to put forth their roots. Foraſmuch as we have directed you, after what manner vines muſt be planted; we ſhall now teach you how to cultivate them.

CHAP. V.

After what Manner Vines ought to be cultivated.

SUFFER the vineyard that is newly planted to put forth all its buds; and, as ſoon as the young twig or ſhoot ſhall be about four inches, then, at length, pampinate them, and leave two of them for firm-wood; the one, which you may ſet apart to grow to its full length, for forming and conſtituting the vine; and the other, which you may have for a ſubſidiary ſhoot, if, peradventure, that which is deſigned for the row ſhould periſh: this the Huſbandmen call the *Keeper*, or the *Guardian*. Then the next year, when you prune the

vine, leave one rod, which is the beſt. The third year model and adjuſt the vine, while it is tender, into what form you pleaſe. If you deſign to form it for a frame, ſet apart one firm young bough for growth, ſo as you may pare off, with a ſharp pruning hook, the two eyes that are next to the ground, that they may not bud; then leave the three following eyes, and cut off the remaining part of the rod. But, if you deſire, that the vine ſhould ſtand by itſelf, without any ſupport, you muſt ſuffer its arms, or boughs, to grow and extend themſelves as you do thoſe of a tree; and you muſt endeavour, that it be formed into an orbicular ſhape, as exactly as poſſible: for, beſides that it has a beautiful appearance when it is ſo trimmed, it is alſo in leſs danger, and labours leſs, when, being ſtabliſhed and ſecured, as it were, by an equilibrium on every ſide, it reſts upon itſelf. But it will be ſufficient, when the arms of the vine ſhall be firſt ſet apart for growth, that one ſingle eye be left on each ſingle twig, that it may not forthwith be oppreſſed with their burden and weight. After this pruning, when you have gathered the ſprays, dig the vineyard deep, and equally, with hoes; or plow it, if it be laid out ſo wide, as that it can be done.

From the fifteenth of *October*, begin to ablaqueate your vineyard; and ſee that you have it completely ablaqueated before the middle of Winter. Do not dreſs the vine during the ſhorteſt days of Winter, unleſs you have a mind to trace and follow thoſe roots that ſhall appear in the ablaqueation; for then, at length, it will be very proper to ampute them; but to do it in ſuch a manner, as not to hurt the ſtock, but rather leave about one inch of it from the mother, and ſo cut away the root. For, when the root is pared away nearer, beſides that it gives a wound to the vine, and thereby hurts it, there is this farther inconveniency, that from the very ſcar itſelf more roots creep forth: therefore it is beſt, that a ſmall part of the root be left, and ſo to cut away the uppermoſt parts, which Ruſtics call *Summer-roots*; which being cut away after this manner, periſh, and do not hurt the vines any further. Suckers alſo may be cut during the ſhorteſt days; ſo much the rather, becauſe when they are extirpated, during the colds, others do not ſo eaſily ſpring out in their room.

After the ablaqueation is finiſhed, it will be proper, every third year, before the Winter-ſolſtice, to put no leſs than two *ſextarii* of ſoaked dung to the roots of the vines, except pigeons-dung, of which if you put more than an *hemina*, it will hurt the vine: then, after the Winter-ſolſtice, dig all round the pit you have made in ablaqueating, or laying open the roots of the vine, and the earth you

have thrown out of it. Before the vernal Equinox, which is on the twenty-fifth of *March*, level or fill up the hollow you have made by laying open the roots of the vine. After the thirteenth of *April* heap up the earth to the vine: then in Summer harrow it as often as you poſſibly can. Five Labourers ablaqueate a *jugerum* of vineyard in one day; five dig it, and three harrow it. Four Labourers prune a *jugerum* of ſtrong, thriving, finiſhed, and already conſtituted, vineyard in one day; and ſix bind it to the frames or props. As to vines that grow upon, and are ſupported by trees, nothing of this nature can be exactly determined, becauſe the inequality of the trees does not allow us to apprehend exactly what may be a reaſonable taſk for Labourers. Some think fit not to prune the next year a vine that is tranſplanted; then the following year to lop and purge it, and to cut one rod of it to the third eye, which we may ſet apart for growth, and bearing fruit: then the third year, if the vine grows ſtrong, and thrives well, to allow one eye more to the rod we ſet apart for growth: the fourth year, to add two eyes more to the next pruning; and ſo the fifth year at furtheſt, to place the vine upon the frame. This ſame order and method of culture we ourſelves alſo have approved, after having made a trial of it.

CHAP. VI.

Of cutting and propagating an old Vineyard.

I Would not adviſe you to cut an old vineyard, if it has its roots upon the ſurface of the ground; otherwiſe the new vineyard alſo, which ſhall ſpring up out of the cutting, will never have ſtrength ſo as to turn to any account, its roots ſwimming upon the ſurface of the ground; for which reaſon you ſhall not reap any great plenty of fruit; and, notwithſtanding all your pains, it will quickly grow old, and decay. Therefore this ſort of vineyard, if the trunks and bodies of the vines are not dried, and if it can be bended, is eaſily laid flat in furrows made for that purpoſe, and ſo renewed and reſtored. But if it is dried and withered to ſuch a degree, that it cannot be bended, the firſt year ablaqueate it, not too deep, but only towards the ſurface of the ground, ſo that you may not dig up or hurt the roots; and put dung to the roots of the vines, and prune them, ſo as to leave but few firm-wood-branches upon them, on which you

may depend; and dig it carefully, and pampinate it frequently, that it may by no means nouriſh any ſuperfluous and uſeleſs ſprays. When it is thus throughly cultivated, it will produce firm and long woody-branches, which the following year you muſt propagate and make layers of, after you have made trenches for them between the rows of the vines: and then, during the ſpace of three years afterwards, you muſt frequently dig it, till it take firm root, and grow ſtrong; and you muſt kill the mother vine, taking no care of, and making no proviſion for, the ſupport of her which you deſign to remove and take out of the way. The laſt year of the three, you muſt intirely extirpate and take away the mother vine, and ſo reduce the young vineyard into regular rows.

But if an old vineyard, which has nothing left but that the vines are of a good kind, ſhall have its roots ſituated deep in the earth, ſo that they are not ſeen when they are ablaqueated, ablaqueate that vineyard about the beginning of *March*, before you cut it; and, when you have ablaqueated it very deep, cut it immediately. Leave the ſtock four inches from the roots, and, if it can be done, cut it off with a little ſaw, hard by ſome knot, and ſmooth the wound with a very ſharp knife; then put ſmall earth, tolerably well dunged, upon it, ſo that when the ſtock is covered over with it, there may not be leſs than three inches of earth upon the wound, or place, where it was cut. The reaſon for doing this is, that it may not dry and wither with the Sun, and that, from attracting and receiving the moiſture which the earth affords, it may the better yield, and put forth, firm-wood. But a vineyard that is of a bad kind, and alſo unfruitful, and has its uppermoſt parts both mouldy, hollow, and conſumed, if the roots of the vines are placed deep enough in the earth, it will be very proper to ingraft them; provided that, when they are ablaqueated, their lower part, which is laid bare, be amputed ſo exactly even with the ground, that it may not appear above it, when the earth is heaped upon it.

CHAP.

CHAP. VII.

Of propagating Vines.

THERE are three kinds of propagations moſt in uſe: one, whereby a rod ſprung from its mother is committed to a furrow; a ſecond, whereby the mother herſelf is laid flat, and all her young branches divided and diſtributed among ſeveral props; a third kind, whereby the vine is cloven into two or three parts, if it is to be divided and carried into different rows on each ſide. This kind of propagation gathers ſtrength, and grows up very ſlowly, becauſe the vine, being divided, loſes its pith. And, ſince we have mentioned the ſeveral ways of propagating, let us demonſtrate after what manner each of them muſt be performed.

When you have a mind to depreſs, or force down, a young branch from its mother into the earth, make a trench of four feet every way, ſo that the layer may not be hurt by the other's roots. Then leave four eyes, which may reach to the bottom of the trench, that out of them the roots may ſpring; pare away the eyes of the other part that adjoins to the mother, that it may not procreate ſuperfluous and uſeleſs ſprays: but, as to that part which is next to the ground, and is not next to the mother, you muſt not ſuffer it to have more than two, or, at moſt, three eyes, which ought to appear above-ground. See that you pare away the reſt, which are hid under-ground, except the four lowermoſt, leſt the vine put forth roots upon the ſurface of the ground. A vine, propagated after this manner, will quickly ſtrike root, and grow ſtrong; and the third year it muſt be ſevered from its mother.

But, if you have a mind to lay the vine itſelf flat, dig very cautiouſly hard by its roots, ſo as you may not hurt the ſame; and ſupplant the vine, ſo as you may not break it off from the root. When you have laid it flat at its full length, and ſhall ſee how far it can reach, you ſhall make one furrow, into which you may let down the whole vine: then, from that furrow, you ſhall make, as it were, branches of trenches, by which the vine may be propagated, as each of its young branches ſhall require; and ſo you ſhall cover them all over with earth.

But, if the vine has but very little firm-wood, and is to be divided and carried into different rows, and cannot otherwiſe reach to the

props

props to which it is carried, but by ſpreading and dividing it, you muſt take care that you cleave it, with the ſharpeſt bill you can find, in that part where it is forked; and with the ſame iron mend the cut, if it ſhall ſeem any where to be unequally cloven: being thus divided, it may be diſtributed into ſeveral rows.

Alſo that way of propagating vines, which we have found out, is not unprofitable: If at any time a vine be wanting in a row, and the young branch, which is laid in the bottom of the trench, is not ſo long, as that it can be wreathed back again, and raiſed up above the ground, be not at all concerned at its ſhortneſs; but depreſs any young branch whatſoever, whoſe top reaches to the bottom of the trench; and cover it over with earth: then preſerve, and ſet apart for growth, the eyes which are next to the mother herſelf, that they may put forth firm-wood-branches from the upper part. Then, at length, after the ſpace of three years, ampute it, and reduce that part, which you have cut off from its mother, to its own prop, and make it the head of the vine: fill up, by little and little, the trench where the layer is, but not in leſs than three years time: cut away the uppermoſt roots, and dig it frequently.

CHAP. VIII.

Of Ingraftments from Fruit-bearing Vines, in order to make Vines fruitful.

WHEN you have a mind to ingraft a vine, cut off from their mother fruit-bearing ſprays of the beſt kind, at the time when they begin to bud, and when the wind is South. Let the ſpray, which you uſe as a graff, be taken from the top of the vine, and let it be round, with good and frequent knots: then leave three of the ſoundeſt knots; below the third eye pare, with a ſharp knife, the ſpace of two inches, very thin on both ſides, after the manner of a wedge, ſo as you may not hurt the pith: then cut the vine which you deſign to ingraft, and ſmooth the cut, and ſo cleave it; and put the cyons, which you have prepared, into the cleft, as far as they are pared, ſo that the bark of the graff may touch the bark of the vine equally. Whatever you have ingrafted, bind it carefully with a willow, or the bark of an elm; and daub it over with well-wrought clay mixed with ſtraw, and cover the cut, and wrap it up, and bind it ſo cloſe, that

that neither wind nor water may be able to enter; then put moſs over the clay, and ſo bind it again: this thing affords it moiſture, and does not ſuffer it to grow dry, and wither. Below the ingraftment and the binding, wound the vine ſlightly, on both ſides, with a ſharp bill, that the moiſture may rather flow out of theſe wounds, than out of the ingraftment itſelf; for too much moiſture is hurtful, and does not ſuffer the cyons, that are ingrafted into the ſtock, to take hold of it.

Some of the antients thought proper to bore the vine, and ſo put the cyons into it, after they had pared them ſlightly: but we have done this ſame thing after a better manner. For, the antient augre makes a powder like ſaw-duſt, and, by reaſon of this, burns that part which it perforates; but the burnt part very rarely takes hold of, and unites with the cyons, that are ingrafted into it. We, on the contrary, have adapted, to this ſort of graffing, that which we call the *Gallican* wimble: this makes an hole, but does not burn, becauſe it does not make, as it were, a ſaw-duſt, but ſhavings or parings: therefore, when we have cleanſed the hole which we have bored, we ingraft into it the cyons which are pared on all ſides, and ſo daub it all round: ſuch an ingraftment unites and takes hold very eaſily; therefore ſee that you have the ingraftment of your vines finiſhed about the time of the Equinox. Ingraft your moiſt places from the white grape, and the dry from the black.

Make your unfruitful vines fruitful after this manner: Water vines, which yield very little fruit, with ſharp vinegar mixed with aſhes, and daub the ſtock itſelf with the ſame aſhes. But, if any of your vines do not bring to maturity the fruit which they make a ſhew of, but wither and dry up before the grapes grow mellow and ripe, you may cure them, and ſet them to rights after this manner: When the berries upon the grape-ſtalks are come to their natural bigneſs, cut down the vine to the very root, and daub the cut with earth, mixed throughly with an equal quantity of ſharp vinegar, and old urine, and water their roots with the ſame; and dig them frequently. Theſe things make them quickly put forth firm-wood-branches, and convey juice to the grapes.

CHAP.

CHAP. IX.

How a Cluſter of Grapes may have Berries of ſeveral Kinds.

THERE is alſo a kind of ingraftment, which produces ſuch cluſters of grapes, wherein there are found berries of different kinds and colours; and this is effected in ſuch a manner as this: Take four or five, or more rods, if you have a mind, of different kinds; and, after you have carefully compacted them, ſo as to be equal to each other, bind them all together; then inſert them very cloſe into an earthen tube, or into an horn, ſo as they may ſtand out a little at both ends, and looſen and open thoſe parts which ſhall ſtand out; then put them into a trench, and cover them all over with well-dunged earth, and water them till they put forth buds. When the rods ſhall have cohered with one another, and now, after the ſpace of two or three years, have formed an unity, or are united into one, you ſhall break the ſmall tube, and cut the vine with a ſaw, almoſt about the middle of the ſtock, where they ſhall appear to have united themſelves moſt with one another, and grown the cloſeſt together; and ſmooth the cut, and heap up ſmall earth about it, ſo that it may cover the wound three inches deep: when, out of this ſtock, it ſhall have put forth ſhoots, ſet apart for growth the two beſt, pull off the reſt: ſo ſuch grapes will be produced, as we propoſed.

But, that grapes may be produced without grape-ſtones, cut a ſhoot of a vine ſo, as the eyes upon it may not be hurt, and ſcrape out all the pith; then afterwards put the parts exactly together again, as they were before, and bind them together, ſo as you may not bruiſe the eyes; and ſo ſet it in dunged earth, and water it: after it has begun to put forth ſhoots, dig it frequently over and over again, and very deep. When the vine is come to full age, it will produce ſuch grapes without grape-ſtones.

CHAP.

CHAP. X.

How you may prune the Vines after you have gathered the Grapes.

WHEN you have finiſhed the vintage, begin preſently to prune with the very beſt and ſharpeſt iron-tools; ſo the cuts will be made ſmooth: nor will the water be able to remain, and reſt in the vine, which, as ſoon as it ſtops, and abides long upon it, ſpoils and rots the vine, and breeds worms, and other animals, which gnaw and conſume the wood: but make the cuts round; for they the more quickly form a cicatrice. The ſprays that are broad, old, ill-ſhaped, ugly, and crooked, cut all theſe clean away; ſuch ſprays as are young, and bear fruit, and ſometimes their offspring, which you ſhall think fit for your purpoſe, ſet them apart for growth, if the uppermoſt part of the vine is not now in a very ſtrong and thriving condition; and preſerve the arms of the vine: finiſh the pruning as quickly as poſſibly you can. Such ſprays as are dry and old, which cannot be amputed with the pruning-hook, pare away with a ſharp chip-ax.

Prune a weak vineyard, in lean and dry land, immediately after the Winter-ſolſtice; and what part you ſhall not have pruned, return to it again about the firſt of *February*: it is not proper, that a vine or a tree be touched with an iron-tool, from the 13th of *December* to the 13th of *January*. When you prune a vine, make the cut between two eyes; for, if you cut it hard by the eye itſelf, it will receive injury, and will not put forth any firm-wood. But let the cicatrice always look downward: ſo it will not receive any hurt, either from the water, or from the Sun; and it will receive the moiſture rightly. In fat land, and in a ſtrong well-thriving vineyard, leave more eyes and fruit-bearing ſhoots; in that which is poor, leave fewer. Where-ever you ſhall find an arm wanting in a vine, wound it once or twice in that place, about the depth of one inch, with the point of a ſharp bill. Beware you do not take away the whole arm, altho' it be long, except it be all withered and dried up.

See that you have your new vineyard ablaqueated before the Winter-ſolſtice, that it may receive all the ſhowers, and the ſlime: the ſooner you ablaqueate vines and trees, the ſtronger they will be, and the better will they thrive. But all ſuch vines and trees, as are planted on the ſides of hills, and riſing grounds, muſt be ſo ablaqueated, that the little ditches may be made towards the uppermoſt part, hard by

the ſtock; but that, on the lower part, ſmall banks be raiſed higher than theſe, that they may contain the more water and ſlime.

An old vineyard muſt neither be ablaqueated, leſt the roots, which it has towards the ſurface of the ground, wither and dry up; nor plowed, leſt the roots of the vines be torn up, and broken off. Dig it often, and equally, with hoes, and dig it deep; and, before the Winter-ſolſtice, ſtrew the ground with dung and chaff; or, when you have ablaqueated only towards the ſurface all round the vine itſelf, lay dung upon it.

CHAP. XI.

Of pampinating a Vineyard, or pulling off its ſuperfluous Shoots and Leaves.

IT is as profitable to pampinate a vineyard carefully, as to prune it well; for the firm-wood-branches, which have fruit upon them, both gather ſtrength, and thrive the better, and the pruning of the following year is done more expeditiouſly, and the vine alſo becomes not ſo full of ſcars; becauſe, when that which is green and tender is plucked off the vine, it forthwith recovers, and the part grows whole again: beſides theſe things, the grapes alſo ripen the better. See that you have your vineyard pampinated ten days before it begins to bloſſom: take away whatever ſuperfluous thing is ſprung out of it; pluck off whatever is grown out of the top or arms of the vine, provided it has no fruit upon it: cut off the tops of the young branches or rods, leſt they become luxuriant: cover the grapes, that ſhall look towards the South, or the Weſt, with their own peculiar twigs and leaves, that they may not be ſcorched and burnt up with the heat.

CHAP. XII.

Of digging of Vineyards.

AS ſoon as the cluſter of grapes ſhall begin to be of different colours, dig the third digging; and now, when it ſhall have begun to ripen, dig before noon, before it ſhall begin to grow hot, and in the afternoon, when the heat is over; and raiſe the duſt: this thing very much preſerves and defends the grapes, both from the Sun, and from fogs. You muſt neither plow nor dig clayey ground, becauſe

it grows exceeding hard, and cleaves when it is plowed or digged. It is more advantageous to turn up the ground with hoes, than with a plough; the hoe turns up all the ground equally: for beſides that, the plough makes baulks in the ground: the oxen alſo, which plow, break ſome parts of the young branches, and ſometimes whole vines. But there is no end of digging a vineyard; for by how much the oftener you ſhall dig it, by ſo much the greater plenty of fruit you ſhall find.

CHAP. XIII.

To preſerve the Vines from being hurt by Mildew.

IN the ſpring-time, ſee that you have heaps of chaff and ſtraw placed among the rows in the vineyard. When you ſhall feel the cold contrary to what is uſual in that ſeaſon of the year, ſet all the heaps of chaff and ſtraw on fire: ſo the ſmoak will remove the fog, and the mildew.

CHAP. XIV.

To prevent the Ants from climbing up upon the Vines.

BRUISE lupins, and mix them with the maſh of preſſed olives, and therewith daub all round the lower-part of the vine: or boil bitumen with oil; with this alſo touch the lower-part of the vine, the ants will not paſs over it.

CHAP. XV.

How to prevent Rats and Vine-fretters from vexing the Vine.

VINES which are contiguous to buildings, are infeſted by rats and mice. To prevent this, we muſt obſerve, when the Moon is full, and when ſhe is in the ſign of the Lion, or of the Scorpion, or of the Archer, or of the Bull; and we muſt prune them in the night-time with Moon-light. There is a kind of animal, which is called a *vine-fretter*; this commonly gnaws the ſprigs and leaves, while they are yet young and tender: to prevent which, after you have finiſhed the pruning, anoint the pruning-hooks, with which you

have pruned the vineyard, with the blood of a bear; or, if you have a beaver's ſkin, as often as you ſhall whet the pruning-hook, during the time you are pruning them, wipe the edge of it with this ſkin, and ſo begin to prune. Seeing we have ſpoken abundantly of vines, let us now give directions concerning plantations of trees for ſupporting them.

CHAP. XVI.

Of Plantations of Trees for ſupporting Vines.

THE poplar-tree eſpecially nouriſhes the vine, next to this the elm-tree, and then the aſh-tree. The poplar-tree is rejected by moſt people, becauſe it has not a leaf proper for it: but that which Ruſtics call the *Atinian* elm is the nobleſt, and thrives the beſt, and has great plenty of leaves. This muſt be chiefly planted in fat lands, or even in ſuch as are indifferent: but, if rugged and thirſty places muſt be planted with trees, neither the poplar- nor the elm-tree are ſo fit for this purpoſe as mountain-aſhes: theſe are the wild-aſhes, nevertheleſs with ſomewhat broader leaves than the other aſh-trees: nor do they yield a worſe leaf than elms. Goats indeed, and ſheep, ſeek after this leaf alſo with greater liking *than any other*. Therefore let them, who have a mind to form a plantation of trees for ſupporting vines, make trenches four feet every way, a year before they ſet the trees: then, about the firſt of *March*, let them ſet, into the ſame trench, an elm, and a poplar-tree, or an aſh-tree, that, if the elm ſhall fail, the poplar, or the aſh-tree, may ſupply its place: but, if they both ſhall live, let one of them be taken out, and planted in another place.

It is proper, that trees, for ſupporting vines, ſhould be planted at the diſtance of twenty feet from each other; for thus both the trees themſelves, and the vines that are joined to them, will thrive and gather ſtrength the better, and yield better fruit; the corns alſo, which ſhall be in the place where the trees are planted, will ſuffer leſs injury by their ſhade. Dig frequently all round the tree which you ſhall have planted, that it may grow up the more ſpeedily; and ſee you touch it not with an iron-tool for about the ſpace of three years: at the end of thirty-ſix months, you ſhall form it for receiving the vine, and cut off its ſuperfluous branches, leaving every other bough

by

by turns, after the manner of ſteps or ladders. Every other year * (1). The ſixth year, if it ſhall then appear to be ſtrong enough, you muſt match it to a vine after this manner: Leave about the ſpace of one foot from the very ſtock of the tree; then having made a furrow four feet long, and three deep, and two feet and an half broad, you muſt ſuffer it, for two months at leaſt, to be beaten with the ſtorms; then at length, about the firſt of *March*, take up a vine out of the nurſery. not leſs than ten feet long; and prop it, and join it to the tree: do not prune it the next year; but the third year reduce it to one young branch or rod; and leave a few eyes upon it, that it may not creep to a great height, before it grow ſtrong: then, after it has had a large growth, diſtribute and range all its firm-wood-branches over all the ſtories of the tree; ſo nevertheleſs, as you may not burden the vine, but ſet apart for bearing fruit ſuch ſhoots as you may depend upon never fail, and are the ſtrongeſt.

You muſt be as careful to bind as to prune an arbuſtive- or arbour-vine; for in this the ſtrength of the fruit principally conſiſts; and a vine, which is tied to the tree with faſt bindings, and in proper places, holds out more years, and lives longer: therefore it is proper, that ſomebody ſhould follow after the pruning, and obſerve that the bindings be renewed, and the vine ranged and placed in due order, upon proper branches.

CHAP. XVII.

Of Olive-yards.

THE olive-tree rejoices moſt in dry hills, that are full of white clay; but, in moiſt and fat fields, it produces great plenty of boughs and leaves without fruit: but an olive-yard is better formed from truncions than from plants. But *Mago* was of opinion, that the olive-tree ſhould be planted in dry places, either immediately after the Equinox, or before the Winter-ſolſtice. The Huſbandmen of our age keep to the ſpring of the year, for the moſt part, about the firſt

(1) *Alterâ annis* *. After theſe words there ſeems ſomething to be wanting in this ſentence: no doubt, the author directed ſomething to be done every other year; and if we look to the fifth book, *cap.* 6. when treating of the ſame thing, he ſays, that whatever leaves ſhall ſpring out of it, ought, every other year, either to be cut away with a knife, or bound up to the tree, or pulled off.

of

of *May* (1). But the trench for an olive-tree muſt be four feet wide every way; and you muſt throw ſtones and gravel into the bottom of the trench, and then throw in earth four inches deep upon them, and then ſet the little tree ſo ſtraight and upright into it, that that part of it which ſtands out of, and appears above the trench, may be exactly in the middle. But you muſt carefully defend the little tree from ſtorms by propping it, and mixing dung with the earth which is replaced in the trench. It is proper, that olive-trees be planted at the diſtance of ſixty feet from each other, that they may have room to grow and extend themſelves in breadth; for ſuch of them as ſhoot up in height, decay, and come to nothing preſently, and bear little fruit.

The *Licinian* olive is the beſt, the *Pauſian* is the ſecond for oil, and the *Orchis* for food: there are alſo the royal, and the ſhuttle-like olives, which neither for oil, nor for their beautiful appearance, are ſo acceptable as thoſe I firſt mentioned. If you plant an olive-tree in the place from whence you have digged up an oak, it will die; becauſe there are certain worms, which breed, and are brought up, in the root of the oak; and theſe eſpecially conſume the olive-plants. If, in an olive-tree, one branch thrives ſomewhat better than the reſt, unleſs you cut it off, the whole tree will wither, and dry up. It is convenient to mark all the little trees with oker, before they be tranſplanted, that, when they are planted, they may look to the ſame parts of the heavens, which they alſo looked to when they were in the nurſery; otherwiſe they will ſuffer, either by the cold, or the heat, in thoſe parts, which they ſhall have expoſed in a different place and ſituation, contrary to what they have been accuſtomed to.

CHAP. XVIII.

Of conſtituting an Orchard.

BEFORE you conſtitute and form an orchard, incloſe, with a wall, or a ditch, as great an extent of ground as you ſhall have a mind to make uſe of for that purpoſe, ſo that there may be no paſſage, not only for cattle, but even not for a Man, except by the door, till the plants grow up; for if the tops of them be either broken with the hand, or the cattle browſe them, they are ſpoiled for ever.

(1) *Calendas Maïas.* *Pontedera* obſerves here very juſtly, that the true reading ſeems to be *Calendas Martias*; for *Palladius* directs to plant olive-yards in the month of *February*, in temperate places: and *Columella* himſelf clearly enough expreſſes the ſame thing, *lib.* v. *cap.* 9. *viz.* that, in rich and moiſt land, olives ought to be planted in the ſpring of the year, before they begin to bud, which they do long before the month of *May*.

But

But it turns to better account, to diſpoſe the trees according to their ſeveral kinds; eſpecially, that the weak may not be oppreſſed by the ſtronger, which are neither equal to them in ſtrength, nor in bigneſs, nor grow up equally. The earth that is fit for vines, is alſo good for trees.

CHAP. XIX.

Of making Trenches.

DIG the trenches one year before you intend to plant your orchards: ſo they will be macerated with the Sun and the rain; and what you ſhall ſet in them will ſoon ſtrike root. But, if you have a mind to ſet your plants alſo the ſame year you make the trenches, dig the trenches at leaſt two months before; afterwards fill them with ſtraw, and ſet them on fire. The broader and the more open you make the trenches, the better, and the greater plenty of fruit you ſhall have. The trench ought to be like a ſmall moveable oven, the lower-part wider than the upper, that the roots may ſpread and extend themſelves the wider; and that they may admit, through the narrow mouth of the earth, leſs cold in Winter, and leſs heat in Summer: as alſo the earth, that is gathered together into them in ſteep places in riſing grounds, is not waſhed away with the rains. Plant the trees very thin, at conſiderable diſtances from each other, that, when they grow up, they may have room where they may extend their branches; for if you ſet them thick, you can neither ſow any thing under them, nor even ſo will they themſelves be fruitful, unleſs you cut off ſome of the intermediate branches: therefore I am of opinion, that forty feet, and, at leaſt, thirty, be left between the rows.

CHAP. XX.

How you may chooſe the Plants for an Orchard.

CHOOSE and gather plants that are not leſs thick than the helve of an hoe, ſtraight, ſmooth, tall, without botches or gaſhes, and with intire ſound bark; theſe ſtrike root well, and very quickly. If you take the plants off trees, take them chiefly from thoſe which bear good fruit every year, and in great plenty: but you muſt obſerve to pluck the ſame off the ſhoulders of the trees that are oppoſite to the

the Sun-riſing. If you ſet a plant with the root, it will have an equal growth with the other trees which you ſet after you have ingrafted them; but an ingrafted tree is more fruitful than that which is not ingrafted, that is, than that which is ſet in branches or plants *before they are ingrafted* (1).

Before you tranſplant the little trees, mark them with oker, or any other thing you pleaſe, that you may place them expoſed to the ſame winds, to which they ſtood expoſed before: and take care that you tranſplant them from an higher, drier, and poorer land, into that which is lower and flatter, moiſter and fatter. Set ſuch plants eſpecially as are three-forked; let them ſtand out and appear three feet above the earth. If you have a mind to ſet two or three little trees in the ſame trench, take care that they do not touch one another; for ſo they are conſumed and killed by the worms. When you ſet the plants, put down, on the right and left of each of them, into the very bottom of the trench, bundles of ſprays, of the thickneſs of a Man's arm, ſo as they may appear and ſtand out a little above the earth, by which you may, with very little labour, convey water in Summer to their roots. Plant trees, or plants with roots, in Autumn, about the 15th of *October*: ſet cuttings and branches in the Spring, before the trees begin to bud. But, leſt the moth be troubleſome to fig-tree-plants, cover with earth, in the bottom of the trench, a cutting of the maſtich-tree, ſo that the top of it may look downward.

CHAP. XXI.

When the Fig-tree muſt be planted.

PLANT not the fig-tree during the colds; it loves places expoſed to the Sun, and ſuch as abound in pebbles, gravel, and ſometimes rocky ground: it ſoon takes root and grows up in this kind of land, if you make the trenches large and fit for them. The ſeveral kinds of fig-trees, altho' they differ in the taſte, ſhape, and quality of their fruit, yet they are planted after one and the ſame manner, but in lands of a different quality. In places that are cold, and that are watery during the Autumn, plant the early-ripe fig-trees, that you may gather their fruit before the rains begin: in warm places plant

(1) *Si cum radice plantam poſueris*: this ſentence does not ſeem very plain; but, if it is not corrupted, the meaning of it ſeems to be, That the plant of a fruit-tree, ſet with a root, will grow equally well with ſuch as have been ingrafted before they were ſet in the orchard, but they will not be equally fruitful.

Winter-figs. But, if you have a mind to make a fig-tree to be late in ripening, which is not naturally late, when the unripe figs are very ſmall, ſhake the fruit off the tree; it will again produce a ſecond fruit, and will defer to bring it to maturity till the Winter is far advanced. Sometimes alſo it is an advantage, when the trees have begun to put forth their leaves, to cut off the uppermoſt tops of the fig-tree with a very ſharp iron-tool; ſo the trees will both be firmer, and bear more fruit. It will always be of great advantage, as ſoon as the fig-tree ſhall begin to put forth her leaves, to dilute oker with the lees of oil, and to pour it, with human dung, to the root of it: this thing makes greater plenty of fruit, and makes the fig plumper and fuller, and of a more beautiful appearance.

CHAP. XXII.

Of planting Nuts.

ABOUT the time that the Star *Arcturus* riſeth, or about the firſt of *February*, plant the almond, which begins to bud the firſt of any: it requires warm, hard, and dry land; for if you ſet this kind of nut in places of a different nature, it will preſently rot. Before you ſet the nut, ſteep it in water and honey ſodden together, but not too ſweet: ſo it will yield fruit of a ſweeter taſte when it is grown up; and, in the mean time, it will grow the better, and the more ſpeedily. Place three nuts in a triangle, and let the ſharper part of the nut be undermoſt, becauſe from thence it puts forth its roots; and let one nut be, at leaſt, an hand-breadth diſtant from the other; and let it incline ſomewhat towards the Weſt. Every nut puts forth one root, and creeps forth with a ſingle ſtalk; when the root comes to the bottom of the trench, being checked by the hardneſs of the ground, it is bended back again; and, extending itſelf, ſends forth other roots after the manner of branches.

You may make an almond and a filbert become a *Tarentinian* nut, after this manner: In the trench wherein you deſign to plant the nut, place ſmall earth, about half a foot deep, and there ſet a ſhoot of fennel-giant; when the fennel-giant is grown up, cleave it, and hide the almond, or the filbert, without a ſhell in the pith of the ſame, and cover it over with earth: do this before the firſt of *March*, or between the ſeventh and the fifteenth of *March*. You may plant the walnut, the pine-apple, and the cheſnut, at this ſame time.

CHAP. XXIII.

Of planting the Pomegranate.

THE pomegranate is rightly planted in the Spring, always till the firſt of *April*; and, if it ſhall bring forth acid fruit, or not ſo ſweet as you would have it, you ſhall cure and make it better in this manner: Moiſten the roots of it with ſtale human urine, human dung, and hogs dung. This thing will both make the tree fertile, and, for the firſt years, makes the fruit have a winy taſte and flavour; and afterwards makes it ſweet alſo, and tender, and without any woody ſubſtance in it. We have mixed a very little *Cyrenian* laſer with wine, and ſo have anointed the uppermoſt tops of the tree with it: this thing corrected the tartneſs of the apples. If you place three ſtones at the very root of the tree when you plant it, they will be a remedy to prevent the apples from burſting upon the tree. But if you have a tree that is already planted, ſow ſquills at the root of the tree. You may prevent this another way: When the apples are already ripe, before they burſt, twiſt the ſtalks on which they hang; by this method you may alſo keep them the whole year.

CHAP. XXIV.

Of the Pear-tree.

PLANT pear-trees in Autumn, before the middle of Winter, ſo that there may remain at leaſt twenty-five days to the Winter-ſolſtice; and, that they may be fertile, ablaqueate them very deep, when they are already grown up to their full growth, and cleave the trunk hard by the very root, and into the clift drive a wedge, made of the heart of pine-wood, and there leave it; then, after you have filled up the ablaqueation, ſcatter aſhes upon the earth.

CHAP. XXV.

Of planting Apples.

PLANT Summer-apples, quinces, ſervice-apples, plums, after the middle of Winter till the 13th of *February*. You will be in the right to plant the mulberry, from the 13th of *February* till the vernal

vernal Equinox. Plant the carob, which ſome call κεράτιον, and then the peach, before the middle of Winter, during the time of Autumn. If almond-trees bear but very little fruit, bore the tree, and drive a ſtone through it, and ſo let the bark of the tree grow over it. But it is proper, about the firſt of *March*, to place, in a regular manner, branches of all thoſe kinds in your orchards, all in beds raiſed in the different quarters thereof, where the earth is both well manured and dunged; then, when they are grown up, care muſt be taken, that, while their little branches are tender and young, they be, as it were, pampinated; and let the plants be reduced to one ſtem the firſt year; and, when the Autumn comes on, it will be expedient to pluck off all their leaves, before the cold nips and dries up their tops; and ſo put, as it were, bonnets upon them, with thick reeds, which have their knots intire at one end; and ſo defend the rods, that are yet young and tender, from the cold, and the froſts: then, after the twenty-fourth month, whether you ſhall have a mind to tranſplant them, and ſet them regularly in rows, or whether you deſign to ingraft them, you may do either the one or the other ſafely enough.

CHAP. XXVI.

Of ingrafting Trees.

EVERY kind of cyon may be ingrafted into every kind of tree, if it is not unlike, in its bark, to that into which it is ingrafted: but, if it brings forth fruit alſo at the ſame time, it may be ingrafted very ſafely, without any ſcruple. The antients have taught us three kinds of ingraftments: one, which, after the tree is cut and cloven, receives the cyons which are inſerted into it; a ſecond, which, after the tree is cut, admits the graffs between the bark and the wood; both which kinds are proper for the Spring ſeaſon: the third, which Huſbandmen call *emplaſtration*, receives the buds themſelves, with a little bark, into a part of itſelf, from which the bark is pulled off; this kind is proper for the Summer. When we come to explain the method of performing theſe ingraftments, we ſhall alſo teach you another invented by us.

Ingraft all trees as ſoon as they ſhall begin to put forth their buds, when the Moon is increaſing; but ingraft the olive-tree about the vernal Equinox, till the 13th of *April*. Whatever tree you have a

mind to ingraft from, and from which you are about to take cyons for ingrafting, ſee that it be young and fruitful, and with frequent knots and joints; and, when the buds ſhall firſt ſwell, chooſe them from off ſmall branches of one year old, which ſhall look to the Sun-riſing, and are ſound: let the grafts be forked, and of the thickneſs of the little finger. Cut the tree you ſhall have a mind to ingraft very carefully, with a ſaw, in that part which is faireſt and ſmootheſt, and without any ſcar; and you muſt take care, that you hurt not the bark: then, when you ſhall have cut the ſtock, ſmooth the cut with a ſharp iron-tool; then put an iron- or ivory-wedge down between the bark and the wood three inches at leaſt; but do it very gently, leſt you hurt or break the bark: afterwards pare the cyons, which you deſign to ingraft, on one ſide, with a ſharp pruning-hook, as low as you have put down the wedge; but ſo as you may not hurt the pith, nor the bark, on the other ſide of it: when you have prepared the cyons, pull out the wedge, and preſently put down the grafts into thoſe holes, which are made by the wedge driven in between the bark and the wood. But put down the grafts by that end where you have pared them, ſo that they may ſtand out ſix inches from the tree: but faſten two or three ſmall branches in one tree, provided there be no leſs a ſpace than of four inches between them: do theſe things according to the bigneſs of the tree, and the goodneſs of the bark. When you have put down all the cyons which the tree will ſuffer, bind up the tree faſt with the bark of an elm- or a willow-tree: afterward daub all the wound over with well-wrought clay mixed with ſtraw, and fill up the ſpace which is between the cyons ſo far, that the grafts may ſtand out two inches: put moſs over the clay, and bind it ſo faſt to it, that it may not be waſted and conſumed by the rain.

If you have a mind to ingraft a very ſmall tree, cut it off near to the earth, ſo that it may ſtand one foot and an half out of the ground: then, when you have made the amputation, ſmooth the wound carefully, and cleave the middle of the ſtock a little way, with a ſharp bill or paring-knife, ſo that there may be a cleft of three inches; then thruſt a wedge into it, as far as it will bear it; and put down cyons into it, pared on both ſides, ſo as you may make the bark of the graft even with the bark of the tree. When you have carefully fitted the cyons, pull out the wedge; then bind up the tree, as I ſaid above, and daub it; then heap up the earth about the tree, as high as the graft itſelf: this thing will very much defend it from the wind and the heat.

The third kind of ingraftment, ſince it is very nice and delicate, is not proper for every kind of tree; and, for the moſt part, thoſe trees admit of ſuch an ingraftment, which have a moiſt, juicy, and ſtrong bark, as the fig-tree; for it both yields great plenty of milk, and has a ſtrong bark; therefore it admits exceeding well of being ingrafted in ſuch a manner. From whatever tree you deſign to take the grafts, in it ſeek out for the young, fair, and ſmooth branches; then, in theſe, obſerve the eye which ſhall have a godly appearance, and a certain hope of producing a bud: mark it all round two inches ſquare, that the eye may be in the middle, and ſo make an inciſion round it with a ſharp penknife; and take off the bark carefully, that you may not hurt the eye: then, into whatever tree you have a mind to ingraft it, chooſe the faireſt and the ſmootheſt branch of the ſame; and make a round inciſion in the bark of the ſame bigneſs, and unbark the wood; and, into that part which you have laid bare, fit, and join exactly, that eye which you have taken from the other tree, ſo that the ſcutcheon may agree to; and fit the part where you have made the roundeſt inciſion. When you have done theſe things, bind it well all round, ſo as you may not hurt it; then daub the joinings and the bands with clay, leaving a ſpace by which the eye may freely put forth its bud. If the tree you have graffed have any ſhoots or upper branches, cut all away, that there may be nothing whereby the juice may be diverted and withdrawn, or to which it may be more ſerviceable, than to the graft itſelf; after one-and-twenty days unbind the ſcutcheon: the olive-tree ſucceeds very well with this kind of ingraftment. We have already taught you that fourth kind of ingraftment, when we treated of vines; therefore it is ſuperfluous to repeat, in this place, the method of terebration, which we have already deſcribed.

CHAP. XXVII.

That Cyons of all Kinds may be graffed upon all Sorts of Trees whatſoever.

BUT ſeeing the antients denied, that all kinds of cyons might be graffed upon any tree whatſoever, and eſtabliſhed, as it were, into a certain law that limitation and determination of this matter, which we made uſe of a little before, *viz.* That thoſe cyons only could coaleſce, which in their bark, and rind, and fruit, are like to thoſe

thoſe trees upon which they are graffed, we thought it neceſſary to inquire into, and confute this erroneous opinion, and to deliver to poſterity a method, whereby all kinds of cyons may be graffed upon all ſorts of trees whatſoever. And, that we may not weary our readers with too long a diſcourſe, we ſhall ſubjoin one example, as it were, by following which, every body may graff any kind of cyon they pleaſe upon all ſorts of trees.

Dig a trench, of four feet every way, at ſuch a diſtance from an olive-tree, that the utmoſt branches of the olive-tree may reach to it; then ſet in the trench a young ſmall fig-tree, and take great care, that it may grow ſtrong, and ſmooth, and be of a goodly appearance. After the ſpace of three or five years, when it has had a large-enough growth, bend down that branch of the olive-tree that ſhall appear to be the goodlieſt and the ſmootheſt of any, and bind it to the ſtock of the fig-tree; and ſo, having cut away the reſt of the ſmall branches, leave only theſe tops which you deſign to graff: then cut the fig-tree, and ſmooth the wound, and cleave it in the middle with a wedge; then pare the tops of the olive-tree on both ſides, as they join to, and grow on their mother, and ſo fit them exactly to the cleft of the fig-tree; and take out the wedge, and bind them carefully together, that they may not be pulled away by any force whatſoever: ſo, in the ſpace of three years after this, the fig-tree will coaleſce with the olive: and then at length, in the fourth year, when they are well united together, you muſt cut off the ſmall olive-branches from their mother, as if they were layers. After this manner all kinds of cyons are graffed upon all ſorts of trees.

CHAP. XXVIII.

Of the Cythiſus, *or Shrub-trefoil.*

IT is very neceſſary to have great plenty of *cythiſus*, or ſhrub-trefoil, (which the *Greeks* call ζέα, or καμαίκη, or τρυφερὴ) becauſe it is exceeding uſeful for hens, bees, ſheep, goats alſo, and all ſorts of cattle whatſoever, which grow ſoon fat with it; and it makes the ewes yield abundance of milk: as alſo, becauſe you may uſe this fodder green for eight months, and afterward you may uſe it dry. Moreover, it quickly takes and grows in any kind of land, tho' exceeding lean; and bears with any ill uſage, without ſuſtaining any hurt. Yea, if women are afflicted with ſcarcity or want of milk, this ſhrub-trefoil muſt be dried and ſteeped in water, when it has

ſoaked throughly the whole night; the day following, three *heminæ* of the juice that is ſqueezed out of it, muſt be mixed with a little wine, and ſo given them to drink: thus they themſelves ſhall enjoy a good ſtate of health, and their children thrive and grow ſtrong with plenty of milk.

But the *cythiſus*, or ſhrub-trefoil, may be ſown either in Autumn, about the 15th of *October*, or in the Spring. After you have manured the earth well, make it into quarters or beds, in the manner of a garden; and there ſow the ſeed of your ſhrub-trefoil in Autumn, as if it were garden-baſil-ſeed: then in the Spring ſet the plants regularly, that they may be the ſpace of four feet every way, diſtant one from another. If you have no ſeed, ſet the tops of the ſhrub-trefoil regularly in the Spring: heap up dunged earth about them: if it does not rain ſoon, water them during the next fifteen days; then, after the ſpace of three years, cut it, and give it to the cattle. Fifteen pound-weight of it, green, is abundantly enough for an horſe, and twenty pounds for an ox; and for other cattle, in proportion to their ſtrength [it may alſo be planted in branches about the month of *September*]. If you give it dry, give a leſs quantity of it, becauſe it has greater ſtrength; and ſteep it firſt in water, and, when you have taken it out, mix it with ſtraw or chaff. Cut down the ſhrub-trefoil, which you deſign for dry forage, about the month of *September*, when its ſeed begins to grow big; then keep it a few hours in the Sun, till it fade; then dry it in the ſhade, and ſo lay it up ſafe.

CHAP. XXIX.

Of the Willow-tree, of Broom, and of the Reed.

PLANT the willow-tree and broom in the Spring, about the firſt of *March*, when the Moon is in her increaſe. The willow-tree requires moiſt places, but broom ſuch as are dry: nevertheleſs, it is very convenient to ſow them both about a vineyard, becauſe they yield bands proper for the young branches of vines. The beſt way of planting reeds is by ſetting their roots, which ſome call *bulbs*, and others call *eyes*. As ſoon as you have paſtinated the ground with the two-feet-deep-ſpade, having cut the root of the reed with a ſharp bill, ſet it when it is juſt going to rain. There are ſome, who lay the intire reeds flat in the ground, becauſe, being thus planted, they put forth reeds from all their joints. But, commonly, this kind produces a reed that

that is ſlender and low, and which ſoon decays: therefore that way of planting them, which we firſt pointed out and explained to you, is the beſt. But my opinion is, that every year, as ſoon as you have cut down the reeds, you ſhould dig the place deep and equally, and ſo water it.

CHAP. XXX.

Of the Violet, and the Roſe.

WHoever is about to raiſe the violet, let him reduce into beds, or borders, ground that is well dunged, and paſtinated at leaſt one foot deep; and ſo let him have his plants, of one year's growth, ſet in ſmall trenches, of one foot dimenſion, before the firſt of *March*. But the ſeed of the violet is ſown, like that of potherbs, in beds, at two different ſeaſons, in the Spring, or in Autumn; and it is cultivated after the ſame manner as the other potherbs are, that it be weeded, that it be ſarcled, and that ſometimes it be watered alſo. It is proper that the roſe-buſh be ſet at the ſame time as the violet, either in ſhrubs, or ſuckers, or in ſhoots, or cuttings (1), all along furrows of one foot dimenſion; but it muſt be digged every year before the firſt of *March*, and pruned here-and-there. When cultivated after this manner, it laſts for many years.

(1) *Roſam fruticibus ac ſurculis*; in the oldeſt editions we read *fructibus & ſurculis*: and *Palladius*, ſpeaking of the ſame thing, has *virgultis & ſemine*; ſo that, conſidering that *Palladius* has always his eye upon *Columella*, it may ſeem probable, that the true reading here ought to be *fructibus*, which will anſwer to *ſemine*, as *ſurculis* to *virgultis*. But, as *Columella* is not treating here ſo much of the different ways of propagating the roſe-buſh, as of the way and manner of ſetting and diſpoſing it, probably he only means what is expreſſed in the tranſlation; and there ſeems no occaſion to alter the text as it now ſtands.

FINIS.

OMISSA.

Lib. 5. cap. I. page 207. the title omitted, *viz. After what manner you ought to meaſure the given forms of land.*

Lib. 7. cap. I. page 303. the title omitted, *viz.* Chap. I. *Of the ſmall he-aſs.*

Page 571. the title omitted, *viz.* Chap. I. *Of a nurſery of vines.*

ERRATA.

Page 16. Line 42. add *commends him.*
ib. l. 43. read *places.*
130. l. 8. read *kinds.*
137. l. 36. read *whether.*
238. l. 11. add *are.*
253. laſt line, read *pound-weight.*
292. l. 30. dele *comma* after *and.*
318. l. 3. inſtead of *for* read *thus.*
339. l. 28. after *word* add *is.*
347. l. 25. dele *s* in *Fowls.*
382. l. 11. for *wherein* read *when.*
382. l. 35. for *thoſe* read *theſe.*
412. l. 18. for *make* read *made.*
423. l. 25. adde *s* to *vomit.*
506. l. 13. for *make* read *made.*
527. l. 23. for *thoſe* read *theſe.*
554. l. 6. for *in* read *by.*
572. l. 16. for *county* read *country.*
573. l. 4. for *when* read *where.*
590. laſt line, add *year.*
597. l. 18. read *round* incifion.