ΘΕΟΦΡΑΣΤΟΥ

ΠΕΡΙ ΦΥΤΩΝ ΙΣΤΟΡΙΑΣ

Α

I. Τῶν φυτῶν τὰς διαφορὰς καὶ τὴν ἄλλην φύσιν ληπτέον κατά τε τὰ μέρη καὶ τὰ πάθη καὶ τὰς γενέσεις καὶ τοὺς βίους· ἤθη γὰρ καὶ πράξεις οὐκ ἔχουσιν ὥσπερ τὰ ζῶα. εἰσὶ δ' αἱ μὲν κατὰ τὴν γένεσιν καὶ τὰ πάθη καὶ τοὺς βίους εὐθεωρητότεραι καὶ ῥᾴους, αἱ δὲ κατὰ τὰ μέρη πλείους ἔχουσι ποικιλίας. αὐτὸ γὰρ τοῦτο πρῶτον οὐχ ἱκανῶς ἀφώρισται τὰ ποῖα δεῖ μέρη καὶ μὴ μέρη καλεῖν, ἀλλ' ἔχει τινὰ ἀπορίαν.

2 Τὸ μὲν οὖν μέρος ἅτε ἐκ τῆς ἰδίας φύσεως ὂν ἀεὶ δοκεῖ διαμένειν ἢ ἁπλῶς ἢ ὅταν γένηται, καθάπερ ἐν τοῖς ζώοις τὰ ὕστερον γενησόμενα, πλὴν εἴ τι

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[1] τὰ ins. Sch., om. Ald.H.

[2] πάθη, a more general word than δυνάμεις, 'virtues': *cf.* 1. 5. 4; 8. 4. 2; it seems to mean here something like 'behaviour,' in relation to environment. Instances of πάθη are given 4. 2. 11; 4. 14. 6.

[3] ἔχουσι conj. H.; ἔχουσαι W. with Ald.

THEOPHRASTUS

ENQUIRY INTO PLANTS

BOOK I

OF THE PARTS OF PLANTS AND THEIR COMPOSITION. OF CLASSIFICATION.

Introductory: How plants are to be classified; difficulty of defining what are the essential 'parts' of a plant especially if plants are assumed to correspond to animals.

I. IN considering the distinctive characters of plants and their nature generally one must take into account their[1] parts, their qualities,[2] the ways in which their life originates, and the course which it follows in each case: (conduct and activities we do not find in them, as we do in animals). Now the differences in the way in which their life originates, in their qualities and in their life-history are comparatively easy to observe and are simpler, while those shewn[3] in their 'parts' present more complexity. Indeed it has not even been satisfactorily determined what ought and what ought not to be called 'parts,' and some difficulty is involved in making the distinction.

Now it appears that by a 'part,' seeing that it is something which belongs to the plant's characteristic nature, we mean something which is permanent either absolutely or when once it has appeared (like those parts of animals which remain for a time undeveloped)

διὰ νόσον ἢ γῆρας ἢ πήρωσιν ἀποβάλλεται. τῶν δ' ἐν τοῖς φυτοῖς ἔνια τοιαῦτ' ἐστὶν ὥστ' ἐπέτειον ἔχειν τὴν οὐσίαν, οἷον ἄνθος βρύον φύλλον καρπός, ἁπλῶς ὅσα πρὸ τῶν καρπῶν ἢ ἅμα γίνεται τοῖς καρποῖς· ἔτι δὲ αὐτὸς ὁ βλαστός· αἰεὶ γὰρ ἐπίφυσιν λαμβάνει τὰ δένδρα κατ' ἐνιαυτὸν ὁμοίως ἔν τε τοῖς ἄνω καὶ ἐν τοῖς περὶ τὰς ῥίζας· ὥστε, εἰ μέν τις ταῦτα θήσει μέρη, τό τε πλῆθος ἀόριστον ἔσται καὶ οὐδέποτε τὸ αὐτὸ τῶν μορίων· εἰ δ' αὖ μὴ μέρη, συμβήσεται, δι' ὧν τέλεια γίνεται καὶ φαίνεται, ταῦτα μὴ εἶναι μέρη· βλαστάνοντα γὰρ καὶ θάλλοντα καὶ καρπὸν ἔχοντα πάντα καλλίω καὶ τελειότερα καὶ δοκεῖ καὶ ἔστιν. αἱ μὲν οὖν ἀπορίαι σχεδόν εἰσιν αὗται.

3 Τάχα δὲ οὐχ ὁμοίως ἅπαντα ζητητέον οὔτε ἐν τοῖς ἄλλοις οὔθ' ὅσα πρὸς τὴν γένεσιν, αὐτά τε τὰ γεννώμενα μέρη θετέον οἷον τοὺς καρπούς. οὐδὲ γὰρ τὰ ἔμβρυα τῶν ζώων. εἰ δὲ ἐν τῇ ὥρᾳ ὄψει τοῦτό γε κάλλιστον,

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[1] *i.e.* the male inflorescence of some trees; the term is of course wider than 'catkin.'

[2] *i.e.* flower, catkin, leaf, fruit, shoot.

—permanent, that is, unless it be lost by disease, age or mutilation. However some of the parts of plants are such that their existence is limited to a year, for instance, flower, 'catkin,'[1] leaf, fruit, in fact all those parts which are antecedent to the fruit or else appear along with it. Also the new shoot itself must be included with these; for trees always make fresh growth every year alike in the parts above ground and in those which pertain to the roots. So that if one sets these[2] down as 'parts,' the number of parts will be indeterminate and constantly changing; if on the other hand these are not to be called 'parts,' the result will be that things which are essential if the plant is to reach its perfection, and which are its conspicuous features, are nevertheless not 'parts'; for any plant always appears to be, as indeed it is, more comely and more perfect when it makes new growth, blooms, and bears fruit. Such, we may say, are the difficulties involved in defining a 'part.'

But perhaps we should not expect to find in plants a complete correspondence with animals in regard to those things which concern reproduction any more than in other respects; and so we should reckon as 'parts' even those things to which the plant gives birth, for instance their fruits, although[3] we do not so reckon the unborn young of animals. (However, if such[4] a product seems fairest to the eye, because the plant is then in its prime, we can draw no inference from this in

[3] *οὐδὲ γάρ* : *οὐδὲ* seems to mean no more than *οὐ* (*cf. neque enim = non enim*) ; *γάρ* refers back to the beginning of the §.

[4] *ἐν τῇ ὥρᾳ ὄψει τοῦτό γε* I conj.: *τῇ ὥρᾳ ὄψει τό γε* vulg. W.; *τοῦτο*, *i.e.* flower or fruit.

οὐδὲν σημεῖον, ἐπεὶ καὶ τῶν ζώων εὐθενεῖ τὰ κύοντα.

Πολλὰ δὲ καὶ τὰ μέρη κατ' ἐνιαυτὸν ἀποβάλλει, καθάπερ οἵ τε ἔλαφοι τὰ κέρατα καὶ τὰ φωλεύοντα τὰ πτερὰ καὶ τρίχας τετράποδα· ὥστ' οὐδὲν ἄτοπον ἄλλως τε καὶ ὅμοιον ὂν τῷ φυλλοβολεῖν τὸ πάθος.

Ὡσαύτως δ' οὐδὲ τὰ πρὸς τὴν γένεσιν· ἐπεὶ καὶ ἐν τοῖς ζώοις τὰ μὲν συνεκτίκτεται τὰ δ' ἀποκαθαίρεται καθάπερ ἀλλότρια τῆς φύσεως. ἔοικε δὲ παραπλησίως καὶ τὰ περὶ τὴν βλάστησιν ἔχειν. ἡ γάρ τοι βλάστησις γενέσεως χάριν ἐστὶ τῆς τελείας.

4 Ὅλως δὲ καθάπερ εἴπομεν οὐδὲ πάντα ὁμοίως καὶ ἐπὶ τῶν ζώων ληπτέον. δι' ὃ καὶ ὁ ἀριθμὸς ἀόριστος· πανταχῆ γὰρ βλαστητικὸν ἅτε καὶ πανταχῆ ζῶν. ὥστε ταῦτα μὲν οὕτως ὑπολητέον οὐ μόνον εἰς τὰ νῦν ἀλλὰ καὶ τῶν μελλόντων χάριν· ὅσα γὰρ μὴ οἷόν τε ἀφομοιοῦν περίεργον τὸ γλίχεσθαι πάντως, ἵνα μὴ καὶ τὴν οἰκείαν ἀποβάλλωμεν θεωρίαν. ἡ δὲ ἱστορία τῶν φυτῶν ἐστιν ὡς ἁπλῶς εἰπεῖν ἢ κατὰ

[1] εὐθενεῖ conj. Sch., εὐθετεῖ UMVAld. *i.e.* we do not argue from the fact that animals are at their handsomest in the breeding season that the young is therefore 'part' of the animal.

[2] Lit. 'which are in holes,' in allusion to the well-known belief that animals (especially birds) which are out of sight in the winter are hiding in holes; the text is supported by [Arist.] *de plantis* 1. 3, the author of which had evidently read this passage; but possibly some such words as τάς τε φολίδας καὶ have dropped out after φωλεύοντα.

support of our argument, since even among animals those that are with young are at their best.[1])

Again many plants shed their parts every year, even as stags shed their horns, birds which hibernate[2] their feathers, four-footed beasts their hair: so that it is not strange that the parts of plants should not be permanent, especially as what thus occurs in animals and the shedding of leaves in plants are analogous processes.

In like manner the parts concerned with reproduction are not permanent in plants; for even in animals there are things which are separated from the parent when the young is born, and there are other things[3] which are cleansed away, as though neither of these belonged to the animal's essential nature. And so too it appears to be with the growth of plants; for of course growth leads up to reproduction as the completion of the process.[4]

And in general, as we have said, we must not assume that in all respects there is complete correspondence between plants and animals. And that is why the number also of parts is indeterminate; for a plant has the power of growth in all its parts, inasmuch as it has life in all its parts. Wherefore we should assume the truth to be as I have said, not only in regard to the matters now before us, but in view also of those which will come before us presently; for it is waste of time to take great pains to make comparisons where that is impossible, and in so doing we may lose sight also of our proper subject of enquiry. The enquiry into plants, to put it generally, may

[3] *i.e.* the embryo is not the only thing derived from the parent animal which is not a 'part' of it; there is also the food-supply produced with the young, and the after-birth.

[4] *cf. C.P.* 1. 11. 8.

τὰ ἔξω μόρια καὶ τὴν ὅλην μορφὴν ἢ κατὰ τὰ ἐντός, ὥσπερ ἐπὶ τῶν ζώων τὰ ἐκ τῶν ἀνατομῶν.

5 Ληπτέον δ' ἐν αὐτοῖς ποιά τε πᾶσιν ὑπάρχει ταὐτὰ καὶ ποῖα ἴδια καθ' ἕκαστον γένος, ἔτι δὲ τῶν αὐτῶν ποῖα ὅμοια· λέγω δ' οἷον φύλλον ῥίζα φλοιός. οὐ δεῖ δὲ οὐδὲ τοῦτο λανθάνειν εἴ τι κατ' ἀναλογίαν θεωρητέον, ὥσπερ ἐπὶ τῶν ζώων, τὴν ἀναφορὰν ποιουμένους δῆλον ὅτι πρὸς τὰ ἐμφερέστατα καὶ τελειότατα. καὶ ἁπλῶς δὲ ὅσα τῶν ἐν φυτοῖς ἀφομοιωτέον τῷ ἐν τοῖς ζώοις, ὡς ἄν τίς τῷ γ' ἀνάλογον ἀφομοιοῖ. ταῦτα μὲν οὖν διωρίσθω τὸν τρόπον τοῦτον.

6 Αἱ δὲ τῶν μερῶν διαφοραὶ σχεδὸν ὡς τύπῳ λαβεῖν εἰσιν ἐν τρισίν, ἢ τῷ τὰ μὲν ἔχειν τὰ δὲ μή, καθάπερ φύλλα καὶ καρπόν, ἢ τῷ μὴ ὅμοια μηδὲ ἴσα, ἢ τρίτον τῷ μὴ ὁμοίως. τούτων δὲ ἡ μὲν ἀνομοιότης ὁρίζεται σχήματι χρώματι πυκνότητι μανότητι τραχύτητι λειότητι καὶ τοῖς ἄλλοις πάθεσιν, ἔτι δὲ ὅσαι διαφοραὶ τῶν χυλῶν. ἡ δὲ ἀνισότης ὑπεροχῇ καὶ ἐλλείψει κατὰ πλῆθος ἢ μέγεθος. ὡς δ' εἰπεῖν τύπῳ

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[1] A very obscure sentence; so W. renders the MSS. text.
[2] *i.e.* 'inequality' might include 'unlikeness.'

either take account of the external parts and the form of the plant generally, or else of their internal parts: the latter method corresponds to the study of animals by dissection.

Further we must consider which parts belong to all plants alike, which are peculiar to some one kind, and which of those which belong to all alike are themselves alike in all cases; for instance, leaves roots bark. And again, if in some cases analogy ought to be considered (for instance, an analogy presented by animals), we must keep this also in view; and in that case we must of course make the closest resemblances and the most perfectly developed examples our standard; [1] and, finally, the ways in which the parts of plants are affected must be compared to the corresponding effects in the case of animals, so far as one can in any given case find an analogy for comparison. So let these definitions stand.

The essential parts of plants, and the materials of which they are made.

Now the differences in regard to parts, to take a general view, are of three kinds: either one plant may possess them and another not (for instance, leaves and fruit), or in one plant they may be unlike in appearance or size to those of another, or, thirdly, they may be differently arranged. Now the unlikeness between them is seen in form, colour, closeness of arrangement or its opposite, roughness or its opposite, and the other qualities; and again there are the various differences of flavour. The inequality is seen in excess or defect as to number or size, or, to speak generally, [2] all the above-mentioned differences too

κἀκεῖνα πάντα καθ' ὑπεροχὴν καὶ ἔλλειψιν· τὸ
7 γὰρ μᾶλλον καὶ ἧττον ὑπεροχὴ καὶ ἔλλειψις· τὸ δὲ μὴ ὁμοίως τῇ θέσει διαφέρει· λέγω δ' οἷον τὸ τοὺς καρποὺς τὰ μὲν ἐπάνω τὰ δ' ὑποκάτω τῶν φύλλων ἔχειν καὶ αὐτοῦ τοῦ δένδρου τὰ μὲν ἐξ ἄκρου τὰ δὲ ἐκ τῶν πλαγίων, ἔνια δὲ καὶ ἐκ τοῦ στελέχους, οἷον ἡ Αἰγυπτία συκάμινος, καὶ ὅσα δὴ καὶ ὑπὸ γῆς φέρει καρπόν, οἷον ἥ τε ἀραχίδνα καὶ τὸ ἐν Αἰγύπτῳ καλούμενον οὔϊγγον, καὶ εἰ τὰ μὲν ἔχει μίσχον τὰ δὲ μή. καὶ ἐπὶ τῶν ἀνθέων ὁμοίως· τὰ μὲν γὰρ περὶ αὐτὸν τὸν καρπὸν τὰ δὲ ἄλλως. ὅλως δὲ τὸ τῆς θέσεως ἐν τούτοις καὶ τοῖς φύλλοις καὶ ἐν τοῖς βλαστοῖς ληπτέον.

8 Διαφέρει δὲ ἔνια καὶ τῇ τάξει· τὰ μὲν ὡς ἔτυχε, τῆς δ' ἑλάτης οἱ κλῶνες κατ' ἀλλήλους ἑκατέρωθεν· τῶν δὲ καὶ οἱ ὄζοι δι' ἴσου τε καὶ κατ' ἀριθμὸν ἴσοι, καθάπερ τῶν τριόζων.

Ὥστε τὰς μὲν διαφορὰς ἐκ τούτων ληπτέον ἐξ ὧν καὶ ἡ ὅλη μορφὴ συνδηλοῦται καθ' ἕκαστον.

9 Αὐτὰ δὲ τὰ μέρη διαριθμησαμένους πειρατέον περὶ ἑκάστου λέγειν. ἔστι δὲ πρῶτα μὲν καὶ μέγιστα καὶ κοινὰ τῶν πλείστων τάδε, ῥίζα καυλὸς ἀκρεμὼν κλάδος, εἰς ἃ διέλοιτ' ἄν τις

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[1] *cf. C.P.* 5. 1. 9.

[2] *cf.* 1. 6. 11. T. extends the term *καρπός* so as to include any succulent edible part of a plant.

[3] T. does not consider that *καρπός* was necessarily anteceded by a flower.

are included under excess and defect: for the 'more' and the 'less' are the same thing as excess and defect, whereas 'differently arranged' implies a difference of position; for instance, the fruit may be above or below the leaves,[1] and, as to position on the tree itself, the fruit may grow on the apex of it or on the side branches, and in some cases even on the trunk, as in the sycamore; while some plants again even bear their fruit underground, for instance *arakhidna*[2] and the plant called in Egypt *aingon*; again in some plants the fruit has a stalk, in some it has none. There is a like difference in the floral organs: in some cases they actually surround the fruit, in others they are differently placed[3]: in fact it is in regard to the fruit, the leaves, and the shoots that the question of position has to be considered.

Or again there are differences as to symmetry[4]: in some cases the arrangement is irregular, while the branches of the silver-fir are arranged opposite one another; and in some cases the branches are at equal distances apart, and correspond in number, as where they are in three rows.[5]

Wherefore the differences between plants must be observed in these particulars, since taken together they shew forth the general character of each plant.

But, before we attempt to speak about each, we must make a list of the parts themselves. Now the primary and most important parts, which are also common to most, are these—root, stem, branch, twig; these are the parts into which we might divide the plant, regarding them as members,[6] corresponding to

[1] Plin. 16. 122.
[2] *i.e.* ternate.
[3] *i.e.* if we wished to make an anatomical division. μέλη conj. Sch. *cf.* 1. 2. 7; μέρη Ald.

ὥσπερ εἰς μέλη, καθάπερ ἐπὶ τῶν ζώων. ἕκαστόν τε γὰρ ἀνόμοιον καὶ ἐξ ἁπάντων τούτων τὰ ὅλα.

Ἔστι δὲ ῥίζα μὲν δι' οὗ τὴν τροφὴν ἐπάγεται, καυλὸς δὲ εἰς ὃ φέρεται. καυλὸν δὲ λέγω τὸ ὑπὲρ γῆς πεφυκὸς ἐφ' ἕν· τοῦτο γὰρ κοινότατον ὁμοίως ἐπετείοις καὶ χρονίοις, ὃ ἐπὶ τῶν δένδρων καλεῖται στέλεχος· ἀκρεμόνας δὲ τοὺς ἀπὸ τούτου σχιζομένους, οὓς ἔνιοι καλοῦσιν ὄζους. κλάδον δὲ τὸ βλάστημα τὸ ἐκ τούτων ἐφ' ἕν, οἷον μάλιστα τὸ ἐπέτειον.

Καὶ ταῦτα μὲν οἰκειότερα τῶν δένδρων. ὁ δὲ καυλός, ὥσπερ εἴρηται, κοινότερος· ἔχει δὲ οὐ πάντα οὐδὲ τοῦτον, οἷον ἔνια τῶν ποιωδῶν. τὰ δ' ἔχει μὲν οὐκ ἀεὶ δὲ ἀλλ' ἐπέτειον, καὶ ὅσα χρονιώτερα ταῖς ῥίζαις. ὅλως δὲ πολύχουν τὸ φυτὸν καὶ ποικίλον καὶ χαλεπὸν εἰπεῖν καθόλου· σημεῖον δὲ τὸ μηδὲν εἶναι κοινὸν λαβεῖν ὃ πᾶσιν ὑπάρχει, καθάπερ τοῖς ζώοις στόμα καὶ κοιλία. τὰ δὲ ἀναλογίᾳ ταὐτὰ τὰ δ' ἄλλον τρόπον. οὔτε γὰρ ῥίζαν πάντ' ἔχει οὔτε καυλὸν οὔτε ἀκρεμόνα οὔτε κλάδον οὔτε φύλλον οὔτε ἄνθος οὔτε καρπὸν οὔτ' αὖ φλοιὸν ἢ μήτραν ἢ ἶνας ἢ φλέβας, οἷον μύκης ὕδνον· ἐν τούτοις δὲ ἡ οὐσία καὶ ἐν τοῖς τοιούτοις· ἀλλὰ μάλιστα ταῦτα

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[1] *i.e.* before it begins to divide. [2] Or 'knots.'
[3] ἐφ' conj. W.; ὑφ' P_2P_3Ald.
[4] χρονιώτερα conj. Sch.; χρονιάτερων Ald.H.
[5] ἀναλογίᾳ conj. Sch.; ἀναλογία UAld.H.

the members of animals: for each of these is distinct in character from the rest, and together they make up the whole.

The root is that by which the plant draws its nourishment, the stem that to which it is conducted. And by the 'stem' I mean that part which grows above ground and is single[1]; for that is the part which occurs most generally both in annuals and in long-lived plants; and in the case of trees it is called the 'trunk.' By 'branches' I mean the parts which split off from the stem and are called by some 'boughs.'[2] By 'twig' I mean the growth which springs from the branch regarded as a single whole,[3] and especially such an annual growth.

Now these parts belong more particularly to trees. The stem however, as has been said, is more general, though not all plants possess even this, for instance, some herbaceous plants are stemless; others again have it, not permanently, but as an annual growth, including some whose roots live beyond the year.[4] In fact your plant is a thing various and manifold, and so it is difficult to describe in general terms: in proof whereof we have the fact that we cannot here seize on any universal character which is common to all, as a mouth and a stomach are common to all animals; whereas in plants some characters are the same in all, merely in the sense that all have analogous[5] characters, while others correspond otherwise. For not all plants have root, stem, branch, twig, leaf, flower or fruit, or again bark, core, fibres or veins; for instance, fungi and truffles; and yet these and such like characters belong to a plant's essential nature. However, as has been said, these

ὑπάρχει, καθάπερ εἴρηται, τοῖς δένδροις κἀκείνων οἰκειότερος ὁ μερισμός. πρὸς ἃ καὶ τὴν ἀναφορὰν τῶν ἄλλων ποιεῖσθαι δίκαιον.

12 Σχεδὸν δὲ καὶ τὰς ἄλλας μορφὰς ἑκάστων ταῦτα διασημαίνει. διαφέρουσι γὰρ πλήθει τῷ τούτων καὶ ὀλιγότητι καὶ πυκνότητι καὶ μανότητι καὶ τῷ ἐφ' ἓν ἢ εἰς πλείω σχίζεσθαι καὶ τοῖς ἄλλοις τοῖς ὁμοίοις. ἔστι δὲ ἕκαστον τῶν εἰρημένων οὐχ ὁμοιομερές· λέγω δὲ οὐχ ὁμοιομερὲς ὅτι ἐκ τῶν αὐτῶν μὲν ὁτιοῦν μέρος σύγκειται τῆς ῥίζης καὶ τοῦ στελέχους, ἀλλ' οὐ λέγεται στέλεχος τὸ ληφθὲν ἀλλὰ μόριον, ὡς ἐν τοῖς τῶν ζώων μέλεσίν ἐστιν. ἐκ τῶν αὐτῶν μὲν γὰρ ὁτιοῦν τῆς κνήμης ἢ τοῦ ἀγκῶνος, οὐχ ὁμώνυμον δὲ καθάπερ σὰρξ καὶ ὀστοῦν, ἀλλ' ἀνώνυμον· οὐδὲ δὴ τῶν ἄλλων οὐδενὸς ὅσα μονοειδῆ τῶν ὀργανικῶν· ἁπάντων γὰρ τῶν τοιούτων ἀνώνυμα τὰ μέρη. τῶν δὲ πολυειδῶν ὠνομασμένα καθάπερ ποδὸς χειρὸς κεφαλῆς, οἷον δάκτυλος ῥὶς ὀφθαλμός. καὶ τὰ μὲν μέγιστα μέρη σχεδὸν ταῦτά ἐστιν.

II. Ἄλλα δὲ ἐξ ὧν ταῦτα φλοιὸς ξύλον μήτρα, ὅσα ἔχει μήτραν. πάντα δ' ὁμοιομερῆ. καὶ τὰ τούτων δὲ ἔτι πρότερα καὶ ἐξ ὧν ταῦτα, ὑγρὸν ἵς

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[1] There is no exact English equivalent for *ὁμοιομερές*, which denotes a whole composed of parts, each of which is, as it were, a miniature of the whole. *cf.* Arist. *H.A.* 1. 1.

[2] *i.e.* any part taken of flesh or bone may be called 'flesh' or 'bone.'

[3] *e.g.* bark ; *cf.* 1. 2. 1. [4] *e.g.* fruit.

characters belong especially to trees, and our classification of characters belongs more particularly to these; and it is right to make these the standard in treating of the others.

Trees moreover shew forth fairly well the other features also which distinguish plants; for they exhibit differences in the number or fewness of these which they possess, as to the closeness or openness of their growth, as to their being single or divided, and in other like respects. Moreover each of the characters mentioned is not 'composed of like parts'[1]; by which I mean that though any given part of the root or trunk is composed of the same elements as the whole, yet the part so taken is not itself called 'trunk,' but 'a portion of a trunk.' The case is the same with the members of an animal's body; to wit, any part of the leg or arm is composed of the same elements as the whole, yet it does not bear the same name (as it does in the case of flesh or bone[2]); it has no special name. Nor again have subdivisions of any of those other organic parts[3] which are uniform special names, subdivisions of all such being nameless. But the subdivisions of those parts[4] which are compound have names, as have those of the foot, hand, and head, for instance, toe, finger, nose or eye. Such then are the largest[5] parts of the plant.

II. Again there are the things of which such parts are composed, namely bark, wood, and core (in the case of those plants which have it[6]), and these are all 'composed of like parts.' Further there are the things which are even prior to these, from which

[5] *i.e.* the 'compound' parts.

[6] *ξύλον μήτρα* conj. W. from G. *μήτρα ξύλον* MSS.; *ξύλον, ὅσα* conj. W.; *ξύλα, ἢ ὅσα* Ald.H.

φλὲψ σάρξ· ἀρχαὶ γὰρ αὗται· πλὴν εἴ τις λέγοι τὰς τῶν στοιχείων δυνάμεις, αὗται δὲ κοιναὶ πάντων. ἡ μὲν οὖν οὐσία καὶ ἡ ὅλη φύσις ἐν τούτοις.

Ἄλλα δ' ἐστὶν ὥσπερ ἐπέτεια μέρη τὰ πρὸς τὴν καρποτοκίαν, οἷον φύλλον ἄνθος μίσχος· τοῦτο δ' ἐστὶν ᾧ συνήρτηται πρὸς τὸ φυτὸν τὸ φύλλον καὶ ὁ καρπός· ἔτι δὲ [ἕλιξ] βρύον, οἷς ὑπάρχει, καὶ ἐπὶ πᾶσι σπέρμα τὸ τοῦ καρποῦ· καρπὸς δ' ἐστὶ τὸ συγκείμενον σπέρμα μετὰ τοῦ περικαρπίου. παρὰ δὲ ταῦτα ἐνίων ἴδια ἄττα, καθάπερ ἡ κηκὶς δρυὸς καὶ ἡ ἕλιξ ἀμπέλου.

2 Καὶ τοῖς μὲν δένδρεσιν ἔστιν οὕτως διαλαβεῖν. τοῖς δ' ἐπετείοις δῆλον ὡς ἅπαντα ἐπέτεια· μέχρι γὰρ τῶν καρπῶν ἡ φύσις. ὅσα δὴ ἐπετειόκαρπα καὶ ὅσα διετίζει, καθάπερ σέλινον καὶ ἄλλ' ἄττα, καὶ ὅσα δὲ πλείω χρόνον ἔχει, τούτοις ἅπασι καὶ ὁ καυλὸς ἀκολουθήσει κατὰ λόγον· ὅταν γὰρ σπερμοφορεῖν μέλλωσι, τότε ἐκκαυλοῦσιν, ὡς ἕνεκα τοῦ σπέρματος ὄντων τῶν καυλῶν.

Ταῦτα μὲν οὖν ταύτῃ διῃρήσθω. τῶν δὲ ἄρτι εἰρημένων μερῶν πειρατέον ἕκαστον εἰπεῖν τί ἐστιν ὡς ἐν τύπῳ λέγοντας.

3 Τὸ μὲν οὖν ὑγρὸν φανερόν· ὃ δὴ καλοῦσί τινες ἁπλῶς ἐν ἅπασιν ὀπόν, ὥσπερ καὶ Μενέστωρ, οἱ

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[1] *οὐσία* conj. Sch. (but he retracted it); *συνουσία* MSS. (?) Ald.

[2] This definition is quoted by Hesych. *s.v. μίσχος.*

[3] ? om. ἕλιξ, which is mentioned below.

[4] *τὸ συγκείμενον σπέρμα*, lit. 'the compound seed,' *i.e.* as many seeds as are contained in one *περικάρπιον.*

they are derived—sap, fibre, veins, flesh: for these are elementary substances—unless one should prefer to call them the active principles of the elements; and they are common to all the parts of the plant. Thus the essence[1] and entire material of plants consist in these.

Again there are other as it were annual parts, which help towards the production of the fruit, as leaf, flower, stalk (that is, the part by which the leaf and the fruit are attached to the plant),[2] and again tendril,[3] 'catkin' (in those plants that have them). And in all cases there is the seed which belongs to the fruit: by 'fruit' is meant the seed or seeds,[4] together with the seed-vessel. Besides these there are in some cases peculiar parts, such as the gall in the oak, or the tendril in the vine.

In the case of trees we may thus distinguish the annual parts, while it is plain that in annual plants *all* the parts are annual: for the end of their being is attained when the fruit is produced. And with those plants which bear fruit annually, those which take two years (such as celery and certain others[5]) and those which have fruit on them for a longer time —with all these the stem will correspond to the plant's length of life: for plants develop a stem at whatever time they are about to bear seed, seeing that the stem exists for the sake of the seed.

Let this suffice for the definition of these parts: and now we must endeavour to say what each of the parts just mentioned is, giving a general and typical description.

The sap is obvious: some call it simply in all cases 'juice,' as does Menestor[6] among others: others, in

[5] *cf.* 7.1.2 and 3. [6] A Pythagorean philosopher of Sybaris.

δ' ἐν μὲν τοῖς ἄλλοις ἀνωνύμως ἐν δέ τισιν ὀπὸν καὶ ἐν ἄλλοις δάκρυον. ἶνες δὲ καὶ φλέβες καθ' αὐτὰ μὲν ἀνώνυμα τῇ δὲ ὁμοιότητι μεταλαμβάνουσι τῶν ἐν τοῖς ζῴοις μορίων. ἔχει δὲ ἴσως καὶ ἄλλας διαφορὰς καὶ ταῦτα καὶ ὅλως τὸ τῶν φυτῶν γένος· πολύχουν γὰρ ὥσπερ εἰρήκαμεν. ἀλλ' ἐπεὶ διὰ τῶν γνωριμωτέρων μεταδιώκειν δεῖ τὰ ἀγνώριστα, γνωριμώτερα δὲ τὰ μείζω καὶ ἐμφανῇ τῇ αἰσθήσει, δῆλον ὅτι καθάπερ ὑφήγηται
4 περὶ τούτων λεκτέον· ἐπαναφορὰν γὰρ ἕξομεν τῶν ἄλλων πρὸς ταῦτα μέχρι πόσου καὶ πῶς ἕκαστα μετέχει τῆς ὁμοιότητος. εἰλημμένων δὲ τῶν μερῶν μετὰ ταῦτα ληπτέον τὰς τούτων διαφοράς· οὕτως γὰρ ἅμα καὶ ἡ οὐσία φανερὰ καὶ ἡ ὅλη τῶν γενῶν πρὸς ἄλληλα διάστασις.

Ἡ μὲν οὖν τῶν μεγίστων σχεδὸν εἴρηται· λέγω δ' οἷον ῥίζης καυλοῦ τῶν ἄλλων· αἱ γὰρ δυνάμεις καὶ ὧν χάριν ἕκαστον ὕστερον ῥηθήσονται. ἐξ ὧν γὰρ καὶ ταῦτα καὶ τὰ ἄλλα σύγκειται πειρατέον εἰπεῖν ἀρξαμένους ἀπὸ τῶν πρώτων.

Πρῶτα δέ ἐστι τὸ ὑγρὸν καὶ θερμόν· ἅπαν γὰρ φυτὸν ἔχει τινὰ ὑγρότητα καὶ θερμότητα σύμφυτον ὥσπερ καὶ ζῷον, ὧν ὑπολειπόντων γίνεται γῆρας καὶ φθίσις, τελείως δὲ ὑπολιπόντων θάνα-
5 τος καὶ αὔανσις. ἐν μὲν οὖν τοῖς πλείστοις ἀνώ-

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[1] Lit. 'muscles and veins.'

[2] *i.e.* the analogy with animals is probably imperfect, but is useful so far as it goes.

[3] 1. 1. 10. [4] *e.g.* the root, as such.

[5] *e.g.* the different forms which roots assume.

the case of some plants give it no special name, while in some they call it 'juice,' and in others 'gum.' Fibre and 'veins' [1] have no special names in relation to plants, but, because of the resemblance, borrow the names of the corresponding parts of animals. [2] It may be however that, not only these things, but the world of plants generally, exhibits also other differences as compared with animals: for, as we have said,[3] the world of plants is manifold. However, since it is by the help of the better known that we must pursue the unknown, and better known are the things which are larger and plainer to our senses, it is clear that it is right to speak of these things in the way indicated: for then in dealing with the less known things we shall be making these better known things our standard, and shall ask how far and in what manner comparison is possible in each case. And when we have taken the parts,[4] we must next take the differences which they exhibit,[5] for thus will their essential nature become plain, and at the same time the general differences between one kind of plant and another.

Now the nature of the most important parts has been indicated already, that is, such parts as the root, the stem, and the rest: their functions and the reasons for which each of them exists will be set forth presently. For we must endeavour to state of what these, as well as the rest, are composed, starting from their elementary constituents.

First come moisture and warmth: for every plant, like every animal, has a certain amount of moisture and warmth which essentially belong to it; and, if these fall short, age and decay, while, if they fail altogether, death and withering ensue. Now in

νυμος ἡ ὑγρότης, ἐν ἐνίοις δὲ ὠνομασμένη καθάπερ εἴρηται. τὸ αὐτὸ δὲ καὶ ἐπὶ τῶν ζώων ὑπάρχει· μόνη γὰρ ἡ τῶν ἐναίμων ὑγρότης ὠνόμασται, δι' ὃ καὶ διῄρηται πρὸς τοῦτο στερήσει· τὰ μὲν γὰρ ἄναιμα τὰ δ' ἔναιμα λέγεται. ἕν τι μὲν οὖν τοῦτο τὸ μέρος καὶ τὸ τούτῳ συνηρτημένον θερμόν.

Ἄλλα δ' ἤδη ἕτερα τῶν ἐντός, ἃ καθ' ἑαυτὰ μέν ἐστιν ἀνώνυμα, διὰ δὲ τὴν ὁμοιότητα ἀπεικάζεται τοῖς τῶν ζώων μορίοις. ἔχουσι γὰρ ὥσπερ ἶνας· ὅ ἐστι συνεχὲς καὶ σχιστὸν καὶ ἐπίμηκες, ἀπαρά-
6 βλαστον δὲ καὶ ἄβλαστον. ἔτι δὲ φλέβας. αὗται δὲ τὰ μὲν ἄλλα εἰσὶν ὅμοιαι τῇ ἰνί, μείζους δὲ καὶ παχύτεραι καὶ παραβλάστας ἔχουσαι καὶ ὑγρότητα. ἔτι ξύλον καὶ σάρξ. τὰ μὲν γὰρ ἔχει σάρκα τὰ δὲ ξύλον. ἔστι δὲ τὸ μὲν ξύλον σχιστόν, ἡ δὲ σὰρξ πάντη διαιρεῖται ὥσπερ γῇ καὶ ὅσα γῆς· μεταξὺ δὲ γίνεται ἰνὸς καὶ φλεβός· φανερὰ δὲ ἡ φύσις αὐτῆς ἐν ἄλλοις τε καὶ ἐν τοῖς τῶν περικαρπίων δέρμασι. φλοιὸς δὲ καὶ μήτρα κυρίως μὲν λέγεται, δεῖ δὲ αὐτὰ καὶ τῷ λόγῳ διορίσαι. φλοιὸς μὲν οὖν ἐστι τὸ ἔσχατον καὶ χωριστὸν τοῦ ὑποκειμένου σώματος. μήτρα δὲ τὸ μεταξὺ τοῦ ξύλου, τρίτον ἀπὸ τοῦ φλοιοῦ οἷον ἐν τοῖς ὀστοῖς μυελός. καλοῦσι δέ τινες τοῦτο

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[1] πλείστοις conj. Mold.; πρώτοις Ald.H. [2] 1. 1. 3.
[3] ἀπαράβλαστον conj. R.Const.; ἀπαράβλητον UMVAld.
[4] ἔτι δὲ conj. W.; ἔχον Ald. [5] Fibre.
[6] *i.e.* can be split in one direction.
[7] *e.g.* an unripe walnut.

most [1] plants the moisture has no special name, but in some it has such a name, as has been said [2]: and this also holds good of animals: for it is only the moisture of those which have blood which has received a name; wherefore we distinguish animals by the presence or absence of blood, calling some 'animals with blood,' others 'bloodless.' Moisture then is one essential 'part,' and so is warmth, which is closely connected with it.

There are also other internal characters, which in themselves have no special name, but, because of their resemblance, have names analogous to those of the parts of animals. Thus plants have what corresponds to muscle; and this quasi-muscle is continuous, fissile, long: moreover no other growth starts from it either branching from the side [3] or in continuation of it. Again [4] plants have veins: these in other respects resemble the 'muscle,' [5] but they are longer and thicker, and have side-growths and contain moisture. Then there are wood and flesh: for some plants have flesh, some wood. Wood is fissile,[6] while flesh can be broken up in any direction, like earth and things made of earth: it is intermediate between fibre and veins, its nature being clearly seen especially in the outer covering [7] of seed-vessels. Bark and core are properly so called,[8] yet they too must be defined. Bark then is the outside, and is separable from the substance which it covers. Core is that which forms the middle of the wood, being third [9] in order from the bark, and corresponding to the marrow in bones. Some call this part the 'heart,' others call it 'heart-wood': some

[5] *i.e.* not by analogy with animals, like 'muscle,' 'veins,' 'flesh.' [9] Reckoning inclusively.

καρδίαν, οἱ δ' ἐντεριώνην· ἔνιοι δὲ τὸ ἐντὸς τῆς μήτρας αὐτῆς καρδίαν, οἱ δὲ μυελόν.

7 Τὰ μὲν οὖν μόρια σχεδόν ἐστι τοσαῦτα. σύγκειται δὲ τὰ ὕστερον ἐκ τῶν προτέρων· ξύλον μὲν ἐξ ἰνὸς καὶ ὑγροῦ, καὶ ἔνια σαρκός· ξυλοῦται γὰρ σκληρυνομένη, οἷον ἐν τοῖς φοίνιξι καὶ νάρθηξι καὶ εἴ τι ἄλλο ἐκξυλοῦται, ὥσπερ αἱ τῶν ῥαφανίδων ῥίζαι· μήτρα δὲ ἐξ ὑγροῦ καὶ σαρκός· φλοιὸς δὲ ὁ μέν τις ἐκ πάντων τῶν τριῶν, οἷον ὁ τῆς δρυὸς καὶ αἰγείρου καὶ ἀπίου· ὁ δὲ τῆς ἀμπέλου ἐξ ὑγροῦ καὶ ἰνός· ὁ δὲ τοῦ φελλοῦ ἐκ σαρκὸς καὶ ὑγροῦ. πάλιν δὲ ἐκ τούτων σύνθετα τὰ μέγιστα καὶ πρῶτα ῥηθέντα καθαπερανεὶ μέλη, πλὴν οὐκ ἐκ τῶν αὐτῶν πάντα οὐδὲ ὡσαύτως ἀλλὰ διαφόρως.

Εἰλημμένων δὲ πάντων τῶν μορίων ὡς εἰπεῖν τὰς τούτων διαφορὰς πειρατέον ἀποδιδόναι καὶ τὰς ὅλων τῶν δένδρων καὶ φυτῶν οὐσίας.

III. Ἐπεὶ δὲ συμβαίνει σαφεστέραν εἶναι τὴν μάθησιν διαιρουμένων κατὰ εἴδη, καλῶς ἔχει τοῦτο ποιεῖν ἐφ' ὧν ἐνδέχεται. πρῶτα δέ ἐστι καὶ μέγιστα καὶ σχεδὸν ὑφ' ὧν πάντ' ἢ τὰ πλεῖστα περιέχεται τάδε, δένδρον θάμνος φρύγανον πόα.

Δένδρον μὲν οὖν ἐστι τὸ ἀπὸ ῥίζης μονοστέλεχες

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[1] φελλοῦ conj. H.; φύλλον UVP$_2$P$_3$Ald.; φυλλοῦ M.
[2] *i.e.* root, stem, branch, twig : *cf.* 1. 1. 9.
[3] σαφεστέραν conj. W. ; σαφέστερον Ald.
[4] εἴδη here = γένη ; *cf.* 6. 1. 2. n.
[5] πάντ' ἢ conj. Sch. after G ; πάντη UMVAld.

again call only the inner part of the core itself the 'heart,' while others distinguish this as the 'marrow.'

Here then we have a fairly complete list of the 'parts,' and those last named are composed of the first 'parts'; wood is made of fibre and sap, and in some cases of flesh also; for the flesh hardens and turns to wood, for instance in palms ferula and in other plants in which a turning to wood takes place, as in the roots of radishes. Core is made of moisture and flesh: bark in some cases of all three constituents, as in the oak black poplar and pear; while the bark of the vine is made of sap and fibre, and that of the cork-oak [1] of flesh and sap. Moreover out of these constituents are made the most important parts,[2] those which I mentioned first, and which may be called 'members': however not all of them are made of the same constituents, nor in the same proportion, but the constituents are combined in various ways.

Having now, we may say, taken all the parts, we must endeavour to give the differences between them and the essential characters of trees and plants taken as wholes.

Definitions of the various classes into which plants may be divided.

III. Now since our study becomes more illuminating [3] if we distinguish different kinds,[4] it is well to follow this plan where it is possible. The first and most important classes, those which comprise all or nearly all [5] plants, are tree, shrub, under-shrub, herb.

A tree is a thing which springs from the root with

πολύκλαδον ὀζωτὸν οὐκ εὐαπόλυτον, οἷον ἐλάα συκῆ ἄμπελος· θάμνος δὲ τὸ ἀπὸ ῥίζης πολύκλαδον, οἷον βάτος παλίουρος. φρύγανον δὲ τὸ ἀπὸ ῥίζης πολυστέλεχες καὶ πολύκλαδον οἷον καὶ θύμβρα καὶ πήγανον. πόα δὲ τὸ ἀπὸ ῥίζης φυλλοφόρον προϊὸν ἀστέλεχες, οὗ ὁ καυλὸς σπερμοφόρος, οἷον ὁ σῖτος καὶ τὰ λάχανα.

2 Δεῖ δὲ τοὺς ὅρους οὕτως ἀποδέχεσθαι καὶ λαμβάνειν ὡς τύπῳ καὶ ἐπὶ τὸ πᾶν λεγομένους· ἔνια γὰρ ἴσως ἐπαλλάττειν δόξειε, τὰ δὲ καὶ παρὰ τὴν ἀγωγὴν ἀλλοιότερα γίνεσθαι καὶ ἐκβαίνειν τῆς φύσεως, οἷον μαλάχη τε εἰς ὕψος ἀναγομένη καὶ ἀποδενδρουμένη· συμβαίνει γὰρ τοῦτο καὶ οὐκ ἐν πολλῷ χρόνῳ ἀλλ' ἐν ἓξ ἢ ἑπτὰ μησὶν, ὥστε μῆκος καὶ πάχος δορατιαῖον γίνεσθαι, δι' ὃ καὶ βακτηρίαις αὐταῖς χρῶνται, πλείονος δὲ χρόνου γινομένου κατὰ λόγον ἡ ἀπόδοσις· ὁμοίως δὲ καὶ ἐπὶ τῶν τεύτλων· καὶ γὰρ ταῦτα λαμβάνει μέγεθος· ἔτι δὲ μᾶλλον ἄγνοι καὶ ὁ παλίουρος καὶ ὁ κιττός, ὥσθ' ὁμολογουμένως ταῦτα γίνεται
3 δένδρα· καί τοι θαμνώδη γέ ἐστιν. ὁ δὲ μύρρινος μὴ ἀνακαθαιρόμενος ἐκθαμνοῦται καὶ ἡ ἡρακλεωτικὴ καρύα. δοκεῖ δὲ αὔτη γε καὶ τὸν καρπὸν βελτίω καὶ πλείω φέρειν ἐὰν ῥάβδους τις ἐᾷ

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[1] *θάμνος . . . πήγανον.* W.'s text transposes, without alteration, the definitions of *θάμνος* and *φρύγανον* as given in U. *φρύγανον δὲ τὸ ἀπὸ ῥίζης καὶ πολυστέλεχες καὶ πολύκλαδον οἷον βάτος παλίουρος*, Ald. So also M, but with a lacuna marked before *φρύγανον* and a note that the definition of *θάμνος* is wanting. *φρύγανον δὲ τὸ ἀπὸ ῥίζης καὶ πολυστέλεχες καὶ πολύκλαδον οἷον καὶ γάμβρη καὶ πήγανον. θάμνος δὲ ἀπὸ ῥίζης πολύκλαδον οἷον βάτος παλίουρος* U. So also very nearly P_1P_2. G gives to *θάμνος* (*frutex*) the definition assigned in U to *φρύγανον* (*suffrutex*) and the other definition is wanting.

a single stem, having knots and several branches, and it cannot easily be uprooted; for instance, olive fig vine. [1]A shrub is a thing which rises from the root with many branches; for instance, bramble Christ's thorn. An under-shrub is a thing which rises from the root with many stems as well as many branches; for instance, savory [2] rue. A herb is a thing which comes up from the root with its leaves and has no main stem, and the seed is borne on the stem; for instance, corn and pot-herbs.

These definitions however must be taken and accepted as applying generally and on the whole. For in the case of some plants it might seem that our definitions overlap; and some under cultivation appear to become different and depart from their essential nature, for instance, mallow [3] when it grows tall and becomes tree-like. For this comes to pass in no long time, not more than six or seven months, so that in length and thickness the plant becomes as great as a spear, and men accordingly use it as a walking-stick, and after a longer period the result of cultivation is proportionately greater. So too is it with the beets; they also increase in stature under cultivation, and so still more do chaste-tree Christ's thorn ivy, so that, as is generally admitted, these become trees, and yet they belong to the class of shrubs. On the other hand the myrtle, unless it is pruned, turns into a shrub, and so does filbert [4]: indeed this last appears to bear better and more abundant fruit, if one leaves

Note that W.'s transposition gives *καὶ . . . καὶ* the proper force; § 4 shews that the *typical φρύγανον* in T.'s view was *πολυστέλεχες*.

[2] *θύμβρα* conj. W.; *γάμβρη* MSS. But the first *καὶ* being meaningless, W. also suggests *σισύμβριον* for *καὶ γάμβρη*.

[3] *cf.* Plin. 19. 62. [4] *cf.* 3. 15. 1.

πλείους ὡς τῆς φύσεως θαμνώδους οὔσης. οὐ μονοστέλεχες δ' ἂν δόξειεν οὐδ' ἡ μηλέα οὐδ' ἡ ῥοιὰ οὐδ' ἡ ἄπιος εἶναι, οὐδ' ὅλως ὅσα παραβλαστητικὰ ἀπὸ τῶν ῥιζῶν ἀλλὰ τῇ ἀγωγῇ τοιαῦτα παραιρουμένων τῶν ἄλλων. ἔνια δὲ καὶ ἐῶσι πολυστελέχη διὰ λεπτότητα, καθάπερ ῥόαν μηλέαν· ἐῶσι δὲ καὶ τὰς ἐλάας κοπάδας καὶ τὰς συκᾶς.

4 Τάχα δ' ἄν τις φαίη καὶ ὅλως μεγέθει καὶ μικρότητι διαιρετέον εἶναι, τὰ δὲ ἰσχύϊ καὶ ἀσθενείᾳ καὶ πολυχρονιότητι καὶ ὀλιγοχρονιότητι. τῶν τε γὰρ φρυγανωδῶν καὶ λαχανωδῶν ἔνια μονοστελέχη καὶ οἷον δένδρου φύσιν ἔχοντα γίνεται, καθάπερ ῥάφανος πήγανον, ὅθεν καὶ καλοῦσί τινες τὰ τοιαῦτα δενδρολάχανα, τά τε λαχανώδη πάντα ἢ τὰ πλεῖστα ὅταν ἐγκαταμείνῃ λαμβάνει τινὰς ὥσπερ ἀκρεμόνας καὶ γίνεται τὸ ὅλον ἐν σχήματι δενδρώδει πλὴν ὀλιγοχρονιώτερα.

5 Διὰ δὴ ταῦτα ὥσπερ λέγομεν οὐκ ἀκριβολογητέον τῷ ὅρῳ ἀλλὰ τῷ τύπῳ ληπτέον τοὺς ἀφορισμούς· ἐπεὶ καὶ τὰς διαιρέσεις ὁμοίως, οἷον ἡμέρων ἀγρίων, καρποφόρων ἀκάρπων, ἀνθοφόρων ἀνανθῶν, ἀειφύλλων φυλλοβόλων. τὰ μὲν γὰρ ἄγρια καὶ ἥμερα παρὰ τὴν ἀγωγὴν εἶναι δοκεῖ· πᾶν γὰρ καὶ ἄγριον καὶ ἥμερόν φησιν Ἵππων γίνεσθαι τυγχάνον ἢ μὴ τυγχάνον θεραπείας.

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[1] *i.e.* so that the tree comes to look like a shrub from the growth of fresh shoots after cutting. *cf.* 2. 6. 12; 2. 7. 2.

[2] *ῥάφανος* conj. Bod. from G; *βαφανὶς* Ald.

[3] *cf.* 3. 2. 2. The Ionian philosopher. See Zeller, *Pre-Socratic Philosophy* (Eng. trans.), 1. 281 f.

[4] *καὶ* add. W.; so G.

[5] *ἢ* conj. Sch.; *καὶ* UAld.Cam.Bas.H.

a good many of its branches untouched, since it is by nature like a shrub. Again neither the apple nor the pomegranate nor the pear would seem to be a tree of a single stem, nor indeed any of the trees which have side stems from the roots, but they acquire the character of a tree when the other stems are removed. However some trees men even leave with their numerous stems because of their slenderness, for instance, the pomegranate and the apple, and they leave the stems of the olive and the fig cut short.[1]

Exact classification impracticable: other possible bases of classification.

Indeed it might be suggested that we should classify in some cases simply by size, and in some cases by comparative robustness or length of life. For of under-shrubs and those of the pot-herb class some have only one stem and come as it were to have the character of a tree, such as cabbage[2] and rue: wherefore some call these 'tree-herbs'; and in fact all or most of the pot-herb class, when they have been long in the ground, acquire a sort of branches, and the whole plant comes to have a tree-like shape, though it is shorter lived than a tree.

For these reasons then, as we are saying, one must not make a too precise definition; we should make our definitions typical. For we must make our distinctions too on the same principle, as those between wild and cultivated plants, fruit-bearing and fruitless, flowering and flowerless, evergreen and deciduous. Thus the distinction between wild and cultivated seems to be due simply to cultivation, since, as Hippon[3] remarks, any plant may be either[4] wild or cultivated according as it receives or[5] does not receive attention.

ἄκαρπα δὲ καὶ κάρπιμα καὶ ἀνθοφόρα καὶ ἀνανθῆ παρὰ τοὺς τόπους καὶ τὸν ἀέρα τὸν περιέχοντα· τὸν αὐτὸν δὲ τρόπον καὶ φυλλοβόλα καὶ ἀείφυλλα. περὶ γὰρ Ἐλεφαντίνην οὐδὲ τὰς ἀμπέλους οὐδὲ τὰς συκᾶς φασι φυλλοβολεῖν.

6 Ἀλλ' ὅμως τοιαῦτα διαιρετέον· ἔχει γάρ τι τῆς φύσεως κοινὸν ὁμοίως ἐν δένδροις καὶ θάμνοις καὶ τοῖς φρυγανικοῖς καὶ ποιώδεσιν· ὑπὲρ ὧν καὶ τὰς αἰτίας ὅταν τις λέγῃ περὶ πάντων κοινῇ δῆλον ὅτι λεκτέον οὐχ ὁρίζοντα καθ' ἕκαστον· εὔλογον δὲ καὶ ταύτας κοινὰς εἶναι πάντων. ἅμα δὲ καὶ φαίνεταί τινα ἔχειν φυσικὴν διαφορὰν εὐθὺς ἐπὶ τῶν ἀγρίων καὶ τῶν ἡμέρων, εἴπερ ἔνια μὴ δύναται ζῆν ὥσπερ τὰ γεωργούμενα μηδ' ὅλως δέχεται θεραπείαν ἀλλὰ χείρω γίνεται, καθάπερ ἑλάτη πεύκη κήλαστρον καὶ ἁπλῶς ὅσα ψυχροὺς τόπους φιλεῖ καὶ χιονώδεις, ὡσαύτως δὲ καὶ τῶν φρυγανικῶν καὶ ποιωδῶν, οἷον κάππαρις καὶ θέρμος. ἥμερον δὲ καὶ ἄγριον δίκαιον καλεῖν ἀναφέροντα πρός τε ταῦτα καὶ ὅλως πρὸς τὸ ἡμερώτατον· [ὁ δ' ἄνθρωπος ἢ μόνον ἢ μάλιστα ἥμερον.]

IV. Φανεραὶ δὲ καὶ κατ' αὐτὰς τὰς μορφὰς αἱ διαφοραὶ τῶν ὅλων τε καὶ μορίων, οἷον λέγω

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[1] ἀνθόφορα καὶ ἀνανθῆ conj. Sch. from G: καρπόφορα ἄνθη P_2Ald. [2] *cf.* 1. 9. 5; Plin. 16. 81.

[3] τοιαῦτα conj. W.; διαιρετέον conj. Sch.; τοῖς αὐτοῖς αἱρετέον Ald. The sense seems to be: Though these 'secondary' distinctions are not entirely satisfactory, yet (if we look to the *causes* of different characters), they are indispensable, since they are due to causes which affect all the four classes of our 'primary' distinction.

[4] *i.e.* we must take the *extreme* cases.

[5] *i.e.* plants which entirely refuse cultivation.

Again the distinctions between fruitless and fruit-bearing,[1] flowering and flowerless, seem to be due to position and the climate of the district. And so too with the distinction between deciduous and evergreen. [2] Thus they say that in the district of Elephantine neither vines nor figs lose their leaves.

Nevertheless we are bound to use such distinctions.[3] For there is a certain common character alike in trees, shrubs, under-shrubs, and herbs. Wherefore, when one mentions the causes also, one must take account of all alike, not giving separate definitions for each class, it being reasonable to suppose that the causes too are common to all. And in fact there seems to be some natural difference from the first in the case of wild and cultivated, seeing that some plants cannot live under the conditions of those grown in cultivated ground, and do not submit to cultivation at all, but deteriorate under it; for instance, silver-fir fir holly, and in general those which affect cold snowy country; and the same is also true of some of the under-shrubs and herbs, such as caper and lupin. Now in using the terms 'cultivated' and 'wild' [4] we must make these [5] on the one hand our standard, and on the other that which is in the truest sense [6] 'cultivated.' [7] Now Man, if he is not the only thing to which this name is strictly appropriate, is at least that to which it most applies.

Differences as to appearance and habitat.

IV. Again the differences, both between the plants as wholes and between their parts, may be seen in

[6] ὅλως πρὸς τὸ. ? πρὸς τὸ ὅλως conj. St.

[7] ὁ δ' ἄνθρωπος . . . ἥμερον. I have bracketed this clause, which seems to be an irrelevant gloss.

μέγεθος καὶ μικρότης, σκληρότης μαλακότης, λειότης τραχύτης, φλοιοῦ φύλλων τῶν ἄλλων, ἁπλῶς εὐμορφία καὶ δυσμορφία τις, ἔτι δὲ καὶ καλλικαρπία καὶ κακοκαρπία. πλείω μὲν γὰρ δοκεῖ τὰ ἄγρια φέρειν, ὥσπερ ἀχρὰς κότινος, καλλίω δὲ τὰ ἥμερα καὶ τοὺς χυλοὺς δὲ αὐτοὺς γλυκυτέρους καὶ ἡδίους καὶ τὸ ὅλον ὡς εἰπεῖν εὐκράτους μᾶλλον.

2 Αὗταί τε δὴ φυσικαί τινες ὥσπερ εἴρηται διαφοραί, καὶ ἔτι δὴ μᾶλλον τῶν ἀκάρπων καὶ καρποφόρων καὶ φυλλοβόλων καὶ ἀειφύλλων καὶ ὅσα ἄλλα τοιαῦτα. πάντων δὲ ληπτέον ἀεὶ καὶ τὰς κατὰ τοὺς τόπους· οὐ γὰρ οὐδ' οἷόν τε ἴσως ἄλλως. αἱ δὲ τοιαῦται δόξαιεν ἂν γενικόν τινα ποιεῖν χωρισμόν, οἷον ἐνύδρων καὶ χερσαίων, ὥσπερ ἐπὶ τῶν ζώων. ἔστι γὰρ ἔνια τῶν φυτῶν ἃ οὐ δύναται μὴ ἐν ὑγρῷ ζῆν· διήρηται δὲ ἄλλο κατ' ἄλλο γένος τῶν ὑγρῶν, ὥστε τὰ μὲν ἐν τέλμασι τὰ δὲ ἐν λίμναις τὰ δ' ἐν ποταμοῖς τὰ δὲ καὶ ἐν αὐτῇ τῇ θαλάττῃ φύεσθαι, τὰ μὲν ἐλάττω καὶ ἐν τῇ παρ' ἡμῖν τὰ δὲ μείζω περὶ τὴν ἐρυθράν. ἔνια δὲ ὡσπερεὶ κάθυγρα καὶ ἕλεια, καθάπερ ἰτέα καὶ πλάτανος, τὰ δὲ οὐκ ἐν ὕδατι δυνάμενα ζῆν οὐδ' ὅλως ἀλλὰ διώκοντα τοὺς ξηροὺς τόπους· τῶν δ' ἐλαττόνων ἔστιν ἃ καὶ τοὺς αἰγιαλούς.

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[1] κατ' αὐτὰς τὰς conj. Sch. ; καὶ τά τ' αὐτὰς τὰς U ; κατὰ ταύτας τὰς MVAld.

[2] πάντων . . . τόπους, text perhaps defective.

[3] *i.e.* as to locality. [4] *cf.* 4. 7. 1.

the appearance itself[1] of the plant. I mean differences such as those in size, hardness, smoothness or their opposites, as seen in bark, leaves, and the other parts; also, in general, differences as to comeliness or its opposite and as to the production of good or of inferior fruit. For the wild kinds appear to bear more fruit, for instance, the wild pear and wild olive, but the cultivated plants better fruit, having even flavours which are sweeter and pleasanter and in general better blended, if one may so say.

These then as has been said, are differences of natural character, as it were, and still more so are those between fruitless and fruitful, deciduous and evergreen plants, and the like. But with all the differences in all these cases we must take into account the locality,[2] and indeed it is hardly possible to do otherwise. Such [3] differences would seem to give us a kind of division into classes, for instance, between that of aquatic plants and that of plants of the dry land, corresponding to the division which we make in the case of animals. For there are some plants which cannot live except in wet; and again these are distinguished from one another by their fondness for different kinds of wetness; so that some grow in marshes, others in lakes, others in rivers, others even in the sea, smaller ones in our own sea, larger ones in the Red Sea.[4] Some again, one may say, are lovers of very wet places,[5] or plants of the marshes, such as the willow and the plane. Others again cannot live at all[6] in water, but seek out dry places; and of the smaller sorts there are some that prefer the shore.

[5] *i.e.* though not actually living *in* water.
[6] οὐδ' ὅλως conj. W.; ἐν τούτοις Ald.H. *Minime* G.

3 Οὐ μὴν ἀλλὰ καὶ τούτων εἴ τις ἀκριβολογεῖσθαι θέλοι, τὰ μὲν ἂν εὕροι κοινὰ καὶ ὥσπερ ἀμφίβια, καθάπερ μυρίκην ἰτέαν κλήθραν, τὰ δὲ καὶ τῶν ὁμολογουμένων χερσαίων πεφυκότα ποτὲ ἐν τῇ θαλάττῃ βιοῦν, φοίνικα σκίλλαν ἀνθέρικον. ἀλλὰ τὰ τοιαῦτα καὶ ὅλως τὸ οὕτω σκοπεῖν οὐκ οἰκείως ἐστὶ σκοπεῖν· οὐδὲ γὰρ οὐδ' ἡ φύσις οὕτως οὐδ' ἐν τοῖς τοιούτοις ἔχει τὸ ἀναγκαῖον. τὰς μὲν οὖν διαιρέσεις καὶ ὅλως τὴν ἱστορίαν τῶν φυτῶν οὕτω ληπτέον. [ἅπαντα δ' οὖν καὶ ταῦτα καὶ τὰ ἄλλα διοίσει καθάπερ εἴρηται ταῖς τε τῶν ὅλων μορφαῖς καὶ ταῖς τῶν μορίων διαφοραῖς, ἢ τῷ ἔχειν τὰ δὲ μὴ ἔχειν, ἢ τῷ πλείω τὰ δ' ἐλάττω, ἢ τῷ ἀνομοίως ἢ ὅσοι τρόποι διῄρηνται
4 πρότερον. οἰκεῖον δὲ ἴσως καὶ τοὺς τόπους συμπαραλαμβάνειν ἐν οἷς ἕκαστα πέφυκεν ἢ μὴ πέφυκε γίνεσθαι. μεγάλη γὰρ καὶ αὕτη διαφορὰ καὶ οὐχ ἥκιστα οἰκεία τῶν φυτῶν διὰ τὸ συνηρτῆσθαι τῇ γῇ καὶ μὴ ἀπολελύσθαι καθάπερ τὰ ζῷα.]

V. Πειρατέον δ' εἰπεῖν τὰς κατὰ μέρος διαφορὰς ὡς ἂν καθόλου λέγοντας πρῶτον καὶ κοινῶς,

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[1] θέλοι conj. Sch.; θέλει Ald.H.

[2] εὕροι conj. Sch.; εὕρῃ Ald.; εὕρῃ H.

[3] Presumably as being sometimes found on the shore below high-water mark.

[4] ἅπαντα . . . ζῷα. This passage seems not to belong here (W.).

[5] τρόποι conj. Sch.; τόποι UMVAld.

However, if one should wish [1] to be precise, one would find [2] that even of these some are impartial and as it were amphibious, such as tamarisk willow alder, and that others even of those which are admitted to be plants of the dry land sometimes live in the sea,[3] as palm squill asphodel. But to consider all these exceptions and, in general, to consider in such a manner is not the right way to proceed. For in such matters too nature certainly does not thus go by any hard and fast law. Our distinctions therefore and the study of plants in general must be understood accordingly. [4] To return—these plants as well as all others will be found to differ, as has been said, both in the shape of the whole and in the differences between the parts, either as to having or not having certain parts, or as to having a greater or less number of parts, or as to having them differently arranged, or because of other differences [5] such as we have already mentioned. And it is perhaps also proper to take into account the situation in which each plant naturally grows or does not grow. For this is an important distinction, and specially characteristic of plants, because they are united to the ground and not free from it like animals.

Characteristic differences in the parts of plants, whether general, special, or seen in qualities and properties.

V. Next we must try to give the differences as to particular parts, in the first instance speaking broadly of those of a general character,[6] and then

[6] *i.e.* those which divide plants into large classes (*e.g.* evergreen and deciduous).

εἶτα καθ' ἕκαστον, ὕστερον ἐπὶ πλεῖον ὥσπερ ἀναθεωροῦντας.

Ἔστι δὲ τὰ μὲν ὀρθοφυῆ καὶ μακροστελέχη καθάπερ ἐλάτη πεύκη κυπάριττος, τὰ δὲ σκολιώτερα καὶ βραχυστελέχη οἷον ἰτέα συκῆ ῥοιά, καὶ κατὰ πάχος δὲ καὶ λεπτότητα ὁμοίως. καὶ πάλιν τὰ μὲν μονοστελέχη τὰ δὲ πολυστελέχη· τοῦτο δὲ ταὐτὸ τρόπον τινὰ καὶ τῷ παραβλαστητικὰ ἢ ἀπαράβλαστα εἶναι· καὶ πολυκλαδῆ καὶ ὀλιγόκλαδα καθάπερ ὁ φοῖνιξ, καὶ ἐν αὐτοῖς τούτοις ἔτι κατὰ ἰσχὺν ἢ πάχος ἢ
2 τὰς τοιαύτας διαφοράς. πάλιν τὰ μὲν λεπτόφλοια, καθάπερ δάφνη φίλυρα, τὰ δὲ παχύφλοια, καθάπερ δρῦς. ἔτι τὰ μὲν λειόφλοια, καθάπερ μηλέα συκῆ, τὰ δὲ τραχύφλοια, καθάπερ ἀγρία δρῦς φελλὸς φοῖνιξ. πάντα δὲ νέα μὲν ὄντα λειοφλοιότερα, ἀπογηράσκοντα δὲ τραχυφλοιότερα, ἔνια δὲ καὶ ῥηξίφλοια, καθάπερ ἄμπελος, τὰ δὲ καὶ ὡς περιπίπτειν, οἷον ἀνδράχλη μηλέα κόμαρος. ἔστι δὲ καὶ τῶν μὲν σαρκώδης ὁ φλοιός, οἷον φελλοῦ δρυὸς αἰγείρου· τῶν δὲ ἰνώδης καὶ ἄσαρκος ὁμοίως δένδρων καὶ θάμνων καὶ ἐπετείων, οἷον ἀμπέλου καλάμου πυροῦ. καὶ τῶν μὲν πολύλοπος, οἷον φιλύρας ἐλάτης ἀμπέλου λινοσπάρτου κρομύων, τῶν δὲ μονόλοπος, οἷον συκῆς

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[1] *i.e.* taking account of differences in qualities, etc. See § 4, but the order in which the three kinds of 'differences' are discussed is not that which is here given; the second is taken first and resumed at 6. 1, the third begins at 5. 4, the first at 14. 4.

[2] ταὐτὸ conj. Sch.; αὐτὸ UMVPAld.

[3] τραχυφλοιότερα conj. H. from G; παχυφ. UMAld. *cf.* Plin. 16. 126.

of special differences between individual kinds; and after that we must take a wider range, making as it were a fresh survey.[1]

Some plants grow straight up and have tall stems, as silver-fir fir cypress; some are by comparison crooked and have short stems, as willow fig pomegranate; and there are like differences as to degree of thickness. Again some have a single stem, others many stems; and this difference corresponds[2] more or less to that between those which have side-growths and those which have none, or that between those which have many branches and those which have few, such as the date-palm. And in these very instances we have also differences in strength thickness and the like. Again some have thin bark, such as bay and lime; others have a thick bark, such as the oak. And again some have smooth bark, as apple and fig; others rough bark, as 'wild oak' (Valonia oak) cork-oak and date-palm. However all plants when young have smoother bark, which gets rougher[3] as they get older; and some have cracked bark,[4] as the vine; and in some cases it readily drops off, as in andrachne apple[5] and arbutus. And again of some the bark is fleshy, as in cork-oak oak poplar; while in others it is fibrous and not fleshy; and this applies alike to trees shrubs and annual plants, for instance to vines reeds and wheat. Again in some the bark has more than one layer, as in lime silver-fir vine Spanish broom[6] onions[7]; while in some it consists of only

[4] *ῥηξίφλοια* conj. St.; *ῥιζίφοια* (?) U; *ῥιζίφλοια* P.; *ῥιζόφλοια* P_2Ald. *cf.* 4. 15. 2, Plin. *l.c.*

[5] *μηλέα* conj. H. Steph., etc.; *νηλεία* UMPAld.; *νήλεια* P_2V. *cf.* Plin. *l.c.*

[6] G appears to have read *λίνου, σπάρτου.* [7] *cf.* 5. 1, 6.

καλάμου αἵρας. κατὰ μὲν δὴ τοὺς φλοιοὺς ἐν τούτοις αἱ διαφοραί.

3 Τῶν δὲ ξύλων αὐτῶν καὶ ὅλως τῶν καυλῶν οἱ μέν εἰσι σαρκώδεις, οἷον δρυὸς συκῆς, καὶ τῶν ἐλαττόνων ῥάμνου τεύτλου κωνείου· οἱ δὲ ἄσαρκοι, καθάπερ κέδρου λωτοῦ κυπαρίττου. καὶ οἱ μὲν ἰνώδεις· τὰ γὰρ τῆς ἐλάτης καὶ τοῦ φοίνικος ξύλα τοιαῦτα· τὰ δὲ ἄϊνα, καθάπερ τῆς συκῆς. ὡσαύτως δὲ καὶ τὰ μὲν φλεβώδη τὰ δ' ἄφλεβα. περὶ δὲ τὰ φρυγανικὰ καὶ θαμνώδη καὶ ὅλως τὰ ὑλήματα καὶ ἄλλας τις ἂν λάβοι διαφοράς· ὁ μὲν γὰρ κάλαμος γονατῶδες, ὁ δὲ βάτος καὶ ὁ παλίουρος ἀκανθώδη. ἡ δὲ τύφη καὶ ἔνια τῶν ἑλείων ἢ λιμναίων ὁμοίως ἀδιάφρακτα καὶ ὁμαλῆ, καθάπερ σχοῖνος. ὁ δὲ τοῦ κυπείρου καὶ βουτόμου καυλὸς ὁμαλότητά τινα ἔχει παρὰ τούτους· ἔτι δὲ μᾶλλον ἴσως ὁ τοῦ μύκητος.

4 Αὗται μὲν δὴ δόξαιεν ἂν ἐξ ὧν ἡ σύνθεσις. αἱ δὲ κατὰ τὰ πάθη καὶ τὰς δυνάμεις οἷον σκληρότης μαλακότης γλισχρότης κραυρότης <πυκνότης> μανότης κουφότης βαρύτης καὶ ὅσα ἄλλα τοιαῦτα· ἡ μὲν γὰρ ἰτέα καὶ χλωρὸν εὐθὺ κοῦφον, ὥσπερ ὁ φελλός, ἡ δὲ πύξος καὶ ἡ ἔβενος οὐδὲ αὐανθέντα. καὶ τὰ μὲν σχίζεται, καθάπερ τὰ τῆς

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[1] *ῥάμνου* conj. W.; *θάμνου* P_2; *βαλάνου* Ald.H.

[2] *κωνείου* conj. Sch.; *κωνίου* Ald.U (corrected to *κωνείου*). *cf.* 7. 6. 4.

[3] *δὲ ἄϊνα* conj. Sca from G.; *δὲ βῖνα* U; *δὲ μανά* Ald.; *δὲ . . . να* M.

[4] *ὑλήματα* conj. Sch. (a general term including shrubs, under-shrubs, etc. *cf.* 1. 6. 7; 1. 10. 6); *κλήματα*, Ald.

one coat, as in fig reed darnel. Such are the respects in which bark differs.

Next of the woods themselves and of stems generally some are fleshy, as in oak and fig, and, among lesser plants, in buckthorn[1] beet hemlock[2]; while some are not fleshy, for instance, prickly cedar nettle-tree cypress. Again some are fibrous, for of this character is the wood of the silver-fir and the date-palm; while some are not fibrous,[3] as in the fig. In like manner some are full of 'veins,' others veinless. Further in shrubby plants and under-shrubs and in woody plants[4] in general one might find other differences: thus the reed is jointed, while the bramble and Christ's thorn have thorns on the wood. Bulrush and some of the marsh or pond plants are in like manner[5] without joints and smooth, like the rush; and the stem of galingale and sedge has a certain smoothness beyond those just mentioned; and still more perhaps has that of the mushroom.

Differences as to qualities and properties.

These then would seem to be the differences in the parts which make up the plant. Those which belong to the qualities[6] and properties are such as hardness or softness, toughness or brittleness, closeness or openness of texture, lightness or heaviness, and the like. For willow-wood is light from the first, even when it is green, and so is that of the cork-oak; but box and ebony are not light even when dried. Some woods again can be split,[7] such

[5] *δμοίως*, sense doubtful; *δμωνύμων* conj. W.

[6] *πάθη*, *cf.* I. 1. 1 n.

[7] *σχίζεται* conj. W.; *σχισθέντα* UMVAld.; *σχιστά* H.; *fissiles* G.

ἐλάτης, τὰ δὲ εὔθραυστα μᾶλλον, οἷον τὰ τῆς ἐλάας. καὶ τὰ μὲν ἄοζα, οἷον τὰ τῆς ἀκτῆς, τὰ δὲ ὀζώδη, οἷον τὰ τῆς πεύκης καὶ ἐλάτης.

5 Δεῖ δὲ καὶ τὰς τοιαύτας ὑπολαμβάνειν τῆς φύσεως. εὔσχιστον μὲν γὰρ ἡ ἐλάτη τῷ εὐθυπορεῖν, εὔθραυστον δὲ ἡ ἐλάα διὰ τὸ σκολιὸν καὶ σκληρόν. εὔκαμπτον δὲ ἡ φίλυρα καὶ ὅσα ἄλλα διὰ τὸ γλίσχραν ἔχειν τὴν ὑγρότητα. βαρὺ δὲ ἡ μὲν πύξος καὶ ἡ ἔβενος ὅτι πυκνά, ἡ δὲ δρῦς ὅτι γεώδες. ὡσαύτως δὲ καὶ τὰ ἄλλα πάντα πρὸς τὴν φύσιν πως ἀνάγεται.

VI. Διαφέρουσι δὲ καὶ ταῖς μήτραις· πρῶτον μὲν εἰ ἔνια ἔχει ἢ μὴ ἔχει, καθάπερ τινές φασιν ἄλλα τε καὶ τὴν ἀκτήν· ἔπειτα καὶ ἐν αὐτοῖς τοῖς ἔχουσι· τῶν μὲν γάρ ἐστι σαρκώδης τῶν δὲ ξυλώδης τῶν δὲ ὑμενώδης. καὶ σαρκώδης μὲν οἷον ἀμπέλου συκῆς μηλέας ῥοιᾶς ἀκτῆς νάρθηκος. ξυλώδης δὲ πίτυος ἐλάτης πεύκης, καὶ μάλιστα αὕτη διὰ τὸ ἔνδαδος εἶναι. τούτων δ' ἔτι σκληρότεραι καὶ πυκνότεραι κρανείας πρίνου δρυὸς κυτίσου συκαμίνου ἐβένου λωτοῦ.

2 Διαφέρουσι δὲ αὐταὶ καὶ τοῖς χρώμασι· μέλαιναι γὰρ τῆς ἐβένου καὶ τῆς δρυός, ἣν καλοῦσι μελάνδρυον. ἅπασαι δὲ σκληρότεραι καὶ κραυρό-

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[1] *i.e.* break across the grain. εὔθραυστα mP; ἄθραυστα UPAld.; *fragilis* G. *cf.* 5. 5, Plin. 16. 186.
[2] ἄοζα conj. Palm. from G; λοξά UPAld.
[3] *i.e.* across the grain. [4] *cf.* 5. 6. 2. [5] *cf.* 5. 1. 4.
[6] T. appears not to agree as to elder: see below.

as that of the silver-fir, while others are rather breakable,[1] such as the wood of the olive. Again some are without knots,[2] as the stems of elder, others have knots, as those of fir and silver-fir.

Now such differences also must be ascribed to the essential character of the plant: for the reason why the wood of silver-fir is easily split is that the grain is straight, while the reason why olive-wood is easily broken[3] is that it is crooked and hard. Lime-wood and some other woods on the other hand are easily bent because their sap is viscid.[4] Boxwood and ebony are heavy because the grain is close, and oak because it contains mineral matter.[5] In like manner the other peculiarities too can in some way be referred to the essential character.

Further 'special' differences.

VI. Again there are differences in the 'core': in the first place according as plants have any or have none, as some say[6] is the case with elder among other things; and in the second place there are differences between those which have it, since in different plants it is respectively fleshy, woody, or membranous; fleshy, as in vine fig apple pomegranate elder ferula; woody, as in Aleppo pine silver-fir fir; in the last-named[7] especially so, because it is resinous. Harder again and closer than these is the core of dog-wood kermes-oak oak laburnum mulberry ebony nettle-tree.

The cores in themselves also differ in colour; for that of ebony and oak is black, and in fact in the oak it is called 'oak-black'; and in all these the core is harder and more brittle than the ordinary

[7] αὕτη conj. Sch.; αὐτὴ UAld.; αὐτῇ MV; αὐτῆς P_2.

τεραι τῶν ξύλων· δι' ὃ καὶ οὐχ ὑπομένουσι καμπήν. μανότεραι δὲ αἱ μὲν αἱ δ' οὔ. ὑμενώδεις δ' ἐν μὲν τοῖς δένδροις οὐκ εἰσὶν ἢ σπάνιοι, ἐν δὲ τοῖς θαμνώδεσι καὶ ὅλως τοῖς ὑλήμασιν οἷον καλάμῳ τε καὶ νάρθηκι καὶ τοῖς τοιούτοις εἰσίν. ἔχει δὲ τὴν μήτραν τὰ μὲν μεγάλην καὶ φανεράν, ὡς πρῖνος δρῦς καὶ τἆλλα προειρημένα, τὰ δ' ἀφανεστέραν, οἷον ἐλάα πύξος· οὐ γὰρ ἔστιν ἀφωρισμένην οὕτω λαβεῖν, ἀλλὰ καί φασί τινες οὐ κατὰ τὸ μέσον ἀλλὰ κατὰ τὸ πᾶν ἔχειν· ὥστε μὴ εἶναι τόπον ὡρισμένον· δι' ὃ καὶ ἔνια οὐδ' ἂν δόξειεν ὅλως ἔχειν· ἐπεὶ καὶ τοῦ φοίνικος οὐδεμία φαίνεται διαφορὰ κατ' οὐδέν.

3 Διαφέρουσι δὲ καὶ ταῖς ῥίζαις. τὰ μὲν γὰρ πολύρριζα καὶ μακρόρριζα, καθάπερ συκῆ δρῦς πλάτανος· ἐὰν γὰρ ἔχωσι τόπον, ἐφ' ὁσονοῦν προέρχονται. τὰ δὲ ὀλιγόρριζα, καθάπερ ῥοιὰ μηλέα· τὰ δὲ μονόρριζα, καθάπερ ἐλάτη πεύκη· μονόρριζα δὲ οὕτως, ὅτι μίαν μεγάλην τὴν εἰς βάθος ἔχει μικρὰς δὲ ἀπὸ ταύτης πλείους. ἔχουσι δὲ καὶ τῶν μὴ μονορρίζων ἔνια τὴν ἐκ τοῦ μέσου μεγίστην καὶ κατὰ βάθους, ὥσπερ ἀμυγδαλῆ· ἐλάα δὲ μικρὰν ταύτην τὰς δὲ ἄλλας μείζους καὶ ὡς κεκαρκινωμένας. ἔτι δὲ τῶν μὲν παχεῖαι μᾶλλον τῶν δὲ ἀνωμαλεῖς, καθάπερ δάφνης ἐλάας·

4 τῶν δὲ πᾶσαι λεπταί, καθάπερ ἀμπέλου. διαφέρουσι δὲ καὶ λειότητι καὶ τραχύτητι καὶ πυκνότητι. πάντων γὰρ αἱ ῥίζαι μανότεραι τῶν ἄνω,

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[1] *μανότεραι . . . οὔ*: text can hardly be sound, but sense is clear. [2] *i.e.* homogeneous. [3] Plin. 16. 127.
[4] 3. 6. 4 seems to give a different account.
[5] *cf. C.P.* 3. 23. 5, and *καρκινώδης C.P.* 1. 12. 3; 3. 21. 5.

wood; and for this reason the core of these trees can not be bent. Again the core differs in closeness of texture.[1] A membranous core is not common in trees, if indeed it is found at all; but it is found in shrubby plants and woody plants generally, as in reed ferula and the like. Again in some the core is large and conspicuous, as in kermes-oak oak and the other trees mentioned above; while in others it is less conspicuous, as in olive and box. For in these trees one cannot find it isolated, but, as some say, it is not found in the middle of the stem, being diffused throughout, so that it has no separate place; and for this reason some trees might be thought to have no core at all; in fact in the date-palm the wood is alike throughout.[2]

Differences in root.

[3] Again plants differ in their roots, some having many long roots, as fig oak plane; for the roots of these, if they have room, run to any length. Others again have few roots, as pomegranate and apple, others a single root, as silver-fir and fir; these have a single root in the sense that they have one long one[4] which runs deep, and a number of small ones branching from this. Even in some of those which have more than a single root the middle root is the largest and goes deep, for instance, in the almond; in the olive this central root is small, while the others are larger and, as it were, spread out crab-wise.[5] Again the roots of some are mostly stout, of some of various degrees of stoutness, as those of bay and olive; and of some they are all slender, as those of the vine. Roots also differ in degree of smoothness and in density. For the roots of all

πυκνότεραι δὲ ἄλλαι ἄλλων καὶ ξυλωδέστεραι· καὶ αἱ μὲν ἰνώδεις, ὡς αἱ τῆς ἐλάτης, αἱ δὲ σαρκώδεις μᾶλλον, ὥσπερ αἱ τῆς δρυός, αἱ δὲ οἷον ὀζώδεις καὶ θυσανώδεις, ὥσπερ αἱ τῆς ἐλάας· τοῦτο δὲ ὅτι τὰς λεπτὰς καὶ μικρὰς πολλὰς ἔχουσι καὶ ἀθρόας· ἐπεὶ πᾶσαί γε καὶ ταύτας ἀποφύουσιν ἀπὸ τῶν μεγάλων ἀλλ' οὐχ ὁμοίως ἀθρόας καὶ πολλάς.

Ἔστι δὲ καὶ τὰ μὲν βαθύρριζα, καθάπερ δρῦς, τὰ δ' ἐπιπολαιόρριζα, καθάπερ ἐλάα ῥοιὰ μηλέα κυπάριττος. ἔτι δὲ αἱ μὲν εὐθεῖαι καὶ ὁμαλεῖς, αἱ δὲ σκολιαὶ καὶ παραλλάττουσαι· τοῦτο γὰρ οὐ μόνον συμβαίνει διὰ τοὺς τόπους τῷ μὴ εὐοδεῖν ἀλλὰ καὶ τῆς φύσεως αὐτῆς ἐστιν, ὥσπερ ἐπὶ τῆς δάφνης καὶ τῆς ἐλάας· ἡ δὲ συκῆ καὶ τὰ τοιαῦτα σκολιοῦται διὰ τὸ μὴ εὐοδεῖν.

5 Ἅπασαι δ' ἔμμητροι καθάπερ καὶ τὰ στελέχη καὶ οἱ ἀκρεμόνες· καὶ εὔλογον ἀπὸ τῆς ἀρχῆς. εἰσὶ δὲ καὶ αἱ μὲν παραβλαστητικαὶ εἰς τὸ ἄνω, καθάπερ ἀμπέλου ῥόας, αἱ δὲ ἀπαράβλαστοι, καθάπερ ἐλάτης κυπαρίττου πεύκης. αἱ αὐταὶ δὲ διαφοραὶ καὶ τῶν φρυγανικῶν καὶ τῶν ποιωδῶν καὶ τῶν ἄλλων· πλὴν εἰ ὅλως ἔνια μὴ ἔχει, καθάπερ ὕδνου μύκης πέζις κεραύνιον. τὰ μὲν πολύρριζα καθάπερ πυρὸς τίφη κριθή, πᾶν τὸ τοιοῦτο, καθάπερ εἰκαζούσαις· τὰ δ' ὀλιγόρριζα
6 καθάπερ τὰ χεδροπά. σχεδὸν δὲ καὶ τῶν λαχανωδῶν τὰ πλεῖστα μονόρριζα, οἷον ῥάφανος

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[1] πέζις κεραύνιον : πύξος κράνιον UMVAld. ; πέζις conj. Sch. from Athen. 2. 59 ; κεραύνιον conj. W. *cf.* Plin. 3. 36 and 37, Juv. 5. 117. [2] εἰκαζούσαις : word corrupt ; so UMVAld.
[3] Plin. 19. 98.

plants are less dense than the parts above ground, but the density varies in different kinds, as also does the woodiness. Some are fibrous, as those of the silver-fir, some fleshier, as those of the oak, some are as it were branched and tassel-like, as those of the olive; and this is because they have a large number of fine small roots close together; for all in fact produce these from their large roots, but they are not so closely matted nor so numerous in some cases as in others.

Again some plants are deep-rooting, as the oak, and some have surface roots, as olive pomegranate apple cypress. Again some roots are straight and uniform, others crooked and crossing one another. For this comes to pass not merely on account of the situation because they cannot find a straight course; it may also belong to the natural character of the plant, as in the bay and the olive; while the fig and such like become crooked because they can not find a straight course.

All roots have core, just as the stems and branches do, which is to be expected, as all these parts are made of the same materials. Some roots again have side-growths shooting upwards, as those of the vine and pomegranate, while some have no side-growth, as those of silver-fir cypress and fir. The same differences are found in under-shrubs and herbaceous plants and the rest, except that some have no roots at all, as truffle mushroom bullfist[1] 'thunder-truffle.' Others have numerous roots, as wheat one-seeded wheat barley and all plants of like nature, for instance,[2] . . . . Some have few roots, as leguminous plants. [3]And in general most of the pot-herbs have single roots, as cabbage beet celery

τεῦτλον σέλινον λάπαθος· πλὴν ἔνια καὶ ἀποφυάδας ἔχει μεγάλας, οἷον τὸ σέλινον καὶ τὸ τεῦτλον· καὶ ὡς ἂν κατὰ λόγον ταῦτα βαθυρριζότερα τῶν δένδρων. εἰσὶ δὲ τῶν μὲν σαρκώδεις, καθάπερ ῥαφανίδος γογγυλίδος ἄρου κρόκου· τῶν δὲ ξυλώδεις, οἷον εὐζώμου ὠκίμου· καὶ τῶν ἀγρίων δὲ τῶν πλείστων, ὅσων μὴ εὐθὺς πλείους καὶ σχιζόμεναι, καθάπερ πυροῦ κριθῆς καὶ τῆς καλουμένης πόας. αὕτη γὰρ ἐν τοῖς ἐπετείοις καὶ ἐν τοῖς ποιώδεσιν ἡ διαφορὰ τῶν ῥιζῶν ὥστε τὰς μὲν εὐθὺς σχίζεσθαι πλείους οὔσας καὶ ὁμαλεῖς, τῶν δὲ ἄλλων μίαν ἢ δύο τὰς μεγίστας καὶ ἄλλας ἀπὸ τούτων.

7 Ὅλως δὲ πλείους αἱ διαφοραὶ τῶν ῥιζῶν ἐν τοῖς ὑλήμασι καὶ λαχανώδεσιν· εἰσὶ γὰρ αἱ μὲν ξυλώδεις, ὥσπερ αἱ τοῦ ὠκίμου· αἱ δὲ σαρκώδεις, ὥσπερ αἱ τοῦ τεύτλου καὶ ἔτι δὴ μᾶλλον τοῦ ἄρου καὶ ἀσφοδέλου καὶ κρόκου· αἱ δὲ ὥσπερ ἐκ φλοιοῦ καὶ σαρκός, ὥσπερ αἱ τῶν ῥαφανίδων καὶ γογγυλίδων· αἱ δὲ γονατώδεις, ὥσπερ αἱ τῶν καλάμων καὶ ἀγρώστεων καὶ εἴ τι καλαμῶδες, καὶ μόναι δὴ αὗται ἢ μάλισθ' ὅμοιαι τοῖς ὑπὲρ γῆς· ὥσπερ γὰρ κάλαμοί εἰσιν ἐρριζωμένοι ταῖς λεπταῖς. αἱ δὲ λεπυρώδεις ἢ φλοιώδεις, οἷον αἵ τε τῆς σκίλλης καὶ τοῦ βολβοῦ καὶ ἔτι κρομύου καὶ τῶν τούτοις ὁμοίων. αἰεὶ γὰρ ἔστι περιαιρεῖν αὐτῶν.

8 Πάντα δὲ τὰ τοιαῦτα δοκεῖ καθάπερ δύο γένη ῥιζῶν ἔχειν· τοῖς δὲ καὶ ὅλως τὰ κεφαλοβαρῆ καὶ κατάρριζα πάντα· τήν τε σαρκώδη ταύτην

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[1] The same term being applied to 'herbaceous' plants in general. [2] Plin. 19. 98.

monk's rhubarb; but some have large side-roots, as celery and beet, and in proportion to their size these root deeper than trees. Again of some the roots are fleshy, as in radish turnip cuckoo-pint crocus; of some they are woody, as in rocket and basil. And so with most wild plants, except those whose roots are to start with numerous and much divided, as those of wheat barley and the plant specially[1] called 'grass.' For in annual and herbaceous plants this is the difference between the roots:—Some are more numerous and uniform and much divided to start with, but the others have one or two specially large roots and others springing from them.

To speak generally, the differences in roots are more numerous in shrubby plants and pot-herbs; for some are woody, as those of basil, some fleshy, as those of beet, and still more those of cuckoo-pint asphodel and crocus; some again are made, as it were, of bark and flesh, as those of radishes and turnips; some have joints, as those of reeds and dog's tooth grass and of anything of a reedy character; and these roots alone, or more than any others, resemble the parts above ground; they are in fact like[3] reeds fastened in the ground by their fine roots. Some again have scales or a kind of bark, as those of squill and purse-tassels, and also of onion and things like these. In all these it is possible to strip off a coat.

Now all such plants, seem, as it were, to have two kinds of root; and so, in the opinion of some, this is true generally of all plants which have a solid 'head'[4] and send out roots from it downwards. These have,

[3] *i.e.* the main root is a sort of repetition of the part above ground. [4] *i.e.* bulb, corm, rhizome, etc.

καὶ φλοιώδη, καθάπερ ἡ σκίλλα, καὶ τὰς ἀπὸ ταύτης ἀποπεφυκυίας· οὐ γὰρ λεπτότητι καὶ παχύτητι διαφέρουσι μόνον, ὥσπερ αἱ τῶν δένδρων καὶ τῶν λαχάνων, ἀλλ' ἀλλοῖον ἔχουσι τὸ γένος. ἐκφανεστάτη δ' ἤδη ἥ τε τοῦ ἄρου καὶ ἡ τοῦ κυπείρου· ἡ μὲν γὰρ παχεῖα καὶ λεία καὶ σαρκώδης, ἡ δὲ λεπτὴ καὶ ἰνώδης. διόπερ ἀπορήσειεν ἄν τις εἰ ῥίζας τὰς τοιαύτας θετέον· ᾗ μὲν γὰρ κατὰ γῆς δόξαιεν ἄν, ᾗ δὲ ὑπεναντίως ἔχουσι ταῖς ἄλλαις οὐκ ἂν δόξαιεν. ἡ μὲν γὰρ ῥίζα λεπτοτέρα πρὸς τὸ πόρρω καὶ ἀεὶ σύνοξυς· ἡ δὲ τῶν σκιλλῶν καὶ τῶν βολβῶν καὶ τῶν ἄρων ἀνάπαλιν.

9 Ἔτι δ' αἱ μὲν ἄλλαι κατὰ τὸ πλάγιον ἀφιᾶσι ῥίζας, αἱ δὲ τῶν σκιλλῶν καὶ τῶν βολβῶν οὐκ ἀφιᾶσιν· οὐδὲ τῶν σκορόδων καὶ τῶν κρομύων. ὅλως δέ γε ἐν ταύταις αἱ κατὰ μέσον ἐκ τῆς κεφαλῆς ἠρτημέναι φαίνονται ῥίζαι καὶ τρέφονται. τοῦτο δ' ὥσπερ κῦμα ἢ καρπός, ὅθεν καὶ οἱ ἐγγεοτόκα λέγοντες οὐ κακῶς· ἐπὶ δὲ τῶν ἄλλων τοιοῦτο μὲν οὐδέν ἐστιν· ἐπεὶ δὲ πλεῖον ἡ φύσις ἢ κατὰ ῥίζαν ταύτῃ ἀπορίαν ἔχει. τὸ γὰρ δὴ πᾶν λέγειν τὸ κατὰ γῆς ῥίζαν οὐκ ὀρθόν· καὶ γὰρ ἂν ὁ καυλὸς τοῦ βολβοῦ καὶ ὁ τοῦ γηθύου καὶ

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[1] τὰς conj. Sch.; τῆς Ald.H.; τὴν . . . ἀποπεφυκυῖαν P.

[2] ἀλλ' ἀλλοῖον ἔχουσι conj. St.; ἀλλὰ λεῖον ἔχοντες PMV Ald.; ἀλλοῖον ἐχ. mBas.mP from G; ἀλλ' ἀλλοῖον ἔχουσαι conj. Scal.

[3] *cf.* 4. 10. 5.

[4] καὶ ἀεὶ Ald.; ἀεὶ καὶ conj. W.

[5] Plin. 19. 99.

[6] *cf.* the definition of 'root,' 1. 1. 9.

[7] ἐγγεότοκα λέγοντες conj. W.; *cf.* ἡ τῶν ἐγγεοτόκων τούτων γένεσις in Athenaeus' citation of this passage (2. 60);

that is to say, this fleshy or bark-like root, like squill, as well as the[1] roots which grow from this. For these roots not only differ in degree of stoutness, like those of trees and pot-herbs; they are of quite distinct classes.[2] This is at once quite evident in cuckoo-pint and galingale,[3] the root being in the one case thick smooth and fleshy, in the other thin and fibrous. Wherefore we might question if such roots should be called 'roots'; inasmuch as they are under ground they would seem to be roots, but, inasmuch as they are of opposite character to other roots, they would not. For your root gets slenderer as it gets longer and tapers continuously[4] to a point; but the so-called root of squill purse-tassels and cuckoo-pint does just the opposite.

Again, while the others send out roots at the sides, this is not the case[5] with squill and purse-tassels, nor yet with garlic and onion. In general in these plants the roots which are attached to the 'head' in the middle appear to be real roots and receive nourishment,[6] and this 'head' is, as it were, an embryo or fruit; wherefore those who call such plants 'plants which reproduce themselves underground'[7] give a fair account of them. In other kinds of plants there is nothing of this sort.[8] But a difficult question is raised, since here the 'root' has a character which goes beyond what one associates with roots. For it is not right to call a l that which is underground 'root,' since in that case the stalk[9] of purse-tassels and that of long onion and in general any part which is under-

ειτεοσ οισαλεγοιντες U; ἔν τε τοῖς ὀστοῖς ἀλέγοντες MV (omitting τε) Ald. (omitting τοῖς).

[8] τοιοῦτο μὲν οὐδέν conj. W.; τοῦτο μὲν MSS.

[9] ἂν ὁ καυλός conj. St.; ἀνάκαυλος Ald.

ὅλως ὅσα κατὰ βάθους ἐστὶν εἴησαν ἂν ῥίζαι, καὶ τὸ ὕδνον δὲ καὶ ὃ καλοῦσί τινες ἀσχίον καὶ τὸ οὐϊγγον καὶ εἴ τι ἄλλο ὑπόγειόν ἐστιν· ὧν οὐδέν ἐστι ῥίζα· δυνάμει γὰρ δεῖ φυσικῇ διαιρεῖν καὶ οὐ τόπῳ.

10 Τάχα δὲ τοῦτο μὲν ὀρθῶς λέγεται, ῥίζα δὲ οὐδὲν ἧττόν ἐστιν· ἀλλὰ διαφορά τις αὕτη τῶν ῥιζῶν, ὥστε τὴν μέν τινα τοιαύτην εἶναι τὴν δὲ τοιαύτην καὶ τρέφεσθαι τὴν ἑτέραν ὑπὸ τῆς ἑτέρας. καίτοι καὶ αὗται αἱ σαρκώδεις ἐοίκασιν ἕλκειν. τὰς γοῦν τῶν ἄρων πρὸ τοῦ βλαστάνειν στρέφουσι καὶ γίγνονται μείζους κωλυόμεναι διαβῆναι πρὸς τὴν βλάστησιν. ἐπεὶ ὅτι γε πάντων τῶν τοιούτων ἡ φύσις ἐπὶ τὸ κάτω μᾶλλον ῥέπει φανερόν· οἱ μὲν γὰρ καυλοὶ καὶ ὅλως τὰ ἄνω βραχέα καὶ ἀσθενῆ, τὰ δὲ κάτω μεγάλα καὶ πολλὰ καὶ ἰσχυρὰ οὐ μόνον ἐπὶ τῶν εἰρημένων ἀλλὰ καὶ ἐπὶ καλάμου καὶ ἀγρώστιδος καὶ ὅλως ὅσα καλαμώδη καὶ τούτοις ὅμοια. καὶ ὅσα δὴ ναρθηκώδη, καὶ τούτων ῥίζαι μεγάλαι καὶ σαρκώδεις.

11 Πολλὰ δὲ καὶ τῶν ποιωδῶν ἔχει τοιαύτας ῥίζας, οἷον σπάλαξ κρόκος καὶ τὸ περδίκιον καλούμενον· καὶ γὰρ τοῦτο παχείας τε καὶ πλείους ἔχει τὰς ῥίζας ἢ φύλλα· καλεῖται δὲ περδίκιον διὰ τὸ τοὺς πέρδικας ἐγκυλίεσθαι καὶ ὀρύττειν. ὁμοίως δὲ

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[1] *βάθους* conj. Sch.; *βάθος* Ald.

[2] *καὶ ὃ* W. after U; *καὶ* om. Ald.; G omits also *τὸ* before *οὐϊγγον*, making the three plants synonymous. The passage is cited by Athen., *l.c.*, with considerable variation.

[3] *τοιαύτην* conj. St.; *τοσαύτην* MSS.

[4] *i.e.* the fleshy root (tuber, etc.).

[5] *i.e.* the fibrous root (root proper).

ground[1] would be a root, and so would the truffle, the plant which[2] some call puff-ball, the *uingon*, and all other underground plants. Whereas none of these is a root; for we must base our definition on natural function and not on position.

However it may be that this is a true account and yet that such things are roots no less; but in that case we distinguish two different kinds of root, one being of this character[3] and the other of the other, and the one[4] getting its nourishment from the other[5]; though the fleshy roots too themselves seem to draw nourishment. At all events men invert[6] the roots of cuckoo-pint before it shoots, and so they become larger by being prevented from pushing[7] through to make a shoot. For it is evident that the nature of all such plants is to turn downwards for choice; for the stems and the upper parts generally are short and weak, while the underground parts are large numerous and strong, and that, not only in the instances given, but in reeds dog's-tooth grass and in general in all plants of a reedy character and those like them. Those too which resemble ferula[8] have large fleshy roots.

[9]Many herbaceous plants likewise have such roots, as colchicum[10] crocus and the plant called 'partridge-plant'; for this too has thick roots which are more numerous than its leaves. [11](It is called the 'partridge-plant' because partridges roll in it and grub it up.) So too with the plant called in Egypt

[6] *στρέφουσι* conj. Sch.; *τρέφουσι* MVAld.; *cf.* 7. 12. 2.
[7] *διαβῆναι* conj. W.; *διαθεῖναι* UMV.
[8] *i.e.* have a hollow stem (umbelliferous plants, more or less).
[9] Plin. 19. 99.
[10] *σπάλαξ* UMV; *ἀσπάλαξ* mBas.: perhaps corrupt.
[11] Plin. 21. 102.

καὶ τὸ ἐν Αἰγύπτῳ καλούμενον οὔϊγγον· τὰ μὲν γὰρ φύλλα μεγάλα καὶ ὁ βλαστὸς αὐτοῦ βραχύς, ἡ δὲ ῥίζα μακρὰ καί ἐστιν ὥσπερ ὁ καρπός. διαφέρει τε καὶ ἐσθίεται, καὶ συλλέγουσι δὲ ὅταν
12 ὁ ποταμὸς ἀποβῇ στρέφοντες τὰς βώλους. φανερώτατα δὲ καὶ πλείστην ἔχοντα πρὸς τὰ ἄλλα διαφορὰν τὸ σίλφιον καὶ ἡ καλουμένη μαγύδαρις· ἀμφοτέρων γὰρ τούτων καὶ ἁπάντων τῶν τοιούτων ἐν ταῖς ῥίζαις μᾶλλον ἡ φύσις. ταῦτα μὲν οὖν ταύτῃ ληπτέα.

Ἔνιαι δὲ τῶν ῥιζῶν πλείω δόξαιεν ἂν ἔχειν διαφορὰν παρὰ τὰς εἰρημένας· οἷον αἵ τε τῆς ἀραχίδνης καὶ τοῦ ὁμοίου τῷ ἀράκῳ· φέρουσι γὰρ ἀμφότεραι καρπὸν οὐκ ἐλάττω τοῦ ἄνω· καὶ μίαν μὲν ῥίζαν τὸ ἀρακῶδες τοῦτο παχεῖαν ἔχει τὴν κατὰ βάθους, τὰς δ' ἄλλας ἐφ' ὧν ὁ καρπὸς λεπτοτέρας καὶ ἐπ' ἄκρῳ [καὶ] σχιζομένας πολλαχῇ· φιλεῖ δὲ μάλιστα χωρία τὰ ὕφαμμα· φύλλον δὲ οὐδέτερον ἔχει τούτων οὐδ' ὅμοια τοῖς φύλλοις, ἀλλ' ὥσπερ ἀμφίκαρπα μᾶλλόν ἐστιν· ὃ καὶ φαίνεται θαυμάσιον. αἱ μὲν οὖν φύσεις καὶ δυνάμεις τοσαύτας ἔχουσι διαφοράς.

VII. Αὐξάνεσθαι δὲ πάντων δοκοῦσιν αἱ ῥίζαι πρότερον τῶν ἄνω· καὶ γὰρ φύεται εἰς βάθος· οὐδεμία δὲ καθήκει πλέον ἢ ὅσον ὁ ἥλιος ἐφικνεῖται· τὸ γὰρ θερμὸν τὸ γεννῶν· οὐ μὴν ἀλλὰ

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[1] *οὔϊγγον* mBas.H.; *οὔϊτον* MV; *ουϊτον* Ald.; *cf.* 1. 1. 7; Plin. 21. 88 (*oetum*).

[2] *μεγάλα*: text doubtful (W.).

[3] *διαφέρει*: text doubtful (Sch.).

[4] *στρέφοντες τὰς βώλους* conj. Coraës; *στέφοντες βωμούς* UMVAld. [5] *ἐν* ins. Sch.

ungon[1]; for its leaves are large[2] and its shoots short, while the root is long and is, as it were, the fruit. It is an excellent thing[3] and is eaten; men gather it when the river goes down by turning the clods.[4] But the plants which afford the most conspicuous instances and shew the greatest difference as compared with others are silphium and the plant called *magydaris*; the character of both of these and of all such plants is especially shewn in[5] their roots. Such is the account to be given of these plants.

Again some roots would seem to shew a greater difference[6] than those mentioned, for instance, those of *arakhidna*,[7] and of a plant[8] which resembles *arakos*. For both of these bear a fruit underground which is as large as the fruit above ground, and this *arakos*-like[9] plant has one thick root, namely, the one which runs deep, while the others which bear the 'fruit' are slenderer and branch[10] in many directions at the tip. It is specially fond of sandy ground. Neither of these plants has a leaf nor anything resembling a leaf, but they bear, as it were, two kinds of fruit instead, which seems surprising. So many then are the differences shewn in the characters and functions of roots.

VII. The roots of all plants seem to grow earlier than the parts above ground (for growth does take place downwards[11]). But no root goes down further than the sun reaches, since it is the heat which induces growth. Nevertheless the nature of the soil,

[6] *i.e.* to be even more abnormal: *διαφορὰν* conj. Sch.; *διαφοραὶ* Ald. [7] Plin. 21. 89.
[8] tine-tare. See Index, App. (1).
[9] *ἀρακῶδες* conj. Sch.; *σαρκῶδες* Ald.G.
[10] *καὶ* before *σχιζ.* om. Sch. from G.
[11] *cf. C.P.* 1. 12. 7. (cited by Varro, 1. 45. 3); 3. 3. 1.

ταῦτα μεγάλα συμβάλλεται πρὸς βαθυρριζίαν καὶ ἔτι μᾶλλον πρὸς μακρορριζίαν, ἡ τῆς χώρας φύσις ἐὰν ᾖ κούφη καὶ μανὴ καὶ εὐδίοδος· ἐν γὰρ ταῖς τοιαύταις πορρωτέρω καὶ μείζους αἱ αὐξήσεις. φανερὸν δὲ ἐπὶ τῶν ἡμερωμάτων· ἔχοντα γὰρ ὕδωρ ὁπουοῦν δίεισιν ὡς εἰπεῖν, ἐπειδὰν ὁ τόπος ᾖ κενὸς καὶ μηδὲν τὸ ἀντιστατοῦν. ἦγουν ἐν τῷ Λυκείῳ ἡ πλάτανος ἡ κατὰ τὸν ὀχετὸν ἔτι νέα οὖσα ἐπὶ τρεῖς καὶ τριάκοντα πήχεις ἀφῆκεν ἔχουσα τόπον τε ἅμα καὶ τροφήν.

2 Δόξειε δὲ ὡς εἰπεῖν ἡ συκῆ μακρορριζότατον εἶναι καὶ ὅλως δὲ μᾶλλον τὰ μανὰ καὶ εὐθύρριζα. πάντα δὲ τὰ νεώτερα τῶν παλαιῶν, ἐὰν εἰς ἀκμὴν ἥκωσιν, ἤδη βαθυρριζότερα καὶ μακρορριζότερα. συμφθίνουσι γὰρ καὶ αἱ ῥίζαι τῷ ἄλλῳ σώματι. πάντων δὲ ὁμοίως οἱ χυλοὶ τοῖς φυτοῖς δεινότεροι, τοῖς δὲ ὡς ἐπίπαν· δι' ὃ καὶ ἐνίων πικραὶ ὦν οἱ καρποὶ γλυκεῖς· αἱ δὲ καὶ φαρμακώδεις· ἔνιαι δ' εὐώδεις, ὥσπερ αἱ τῆς ἴριδος.

3 Ἰδία δὲ ῥίζης φύσις καὶ δύναμις ἡ τῆς Ἰνδικῆς συκῆς· ἀπὸ γὰρ τῶν βλαστῶν ἀφίησι, μέχρι οὗ ἂν συνάψῃ τῇ γῇ καὶ ῥιζωθῇ, καὶ γίνεται περὶ τὸ δένδρον κύκλῳ συνεχὲς τὸ τῶν ῥιζῶν οὐχ ἁπτόμενον τοῦ στελέχους ἀλλ' ἀφεστηκός.

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[1] ταῦτα before μέγαλα om. W.

[2] ἡμερωμάτων conj. Sch.; ἡμερωτάτων UP_2Ald.; *cf. C.P.* 5. 6. 8.

[3] ὁπουοῦν MSS.; ὁποσονοῦν conj. W. from G, *in quantum libeat.*

[4] ἐπειδὰν conj. Sch.; ἐπεὶ κἂν UMVPAld.

[5] Quoted by Varro, 1. 37. 5.

[6] ἐπὶ conj. Sch.; παρὰ P_2; περὶ Ald.

[7] συμφθίνουσι : συμφωνοῦσι conj. St.

if it is light open and porous, contributes greatly [1] to deep rooting, and still more to the formation of long roots; for in such soils growth goes further and is more vigorous. This is evident in cultivated plants.[2] For, provided that they have water, they run on, one may say, wherever it may be,[3] whenever [4] the ground is unoccupied and there is no obstacle. [5] For instance the plane-tree by the watercourse in the Lyceum when it was still young sent out its roots a distance of [6] thirty-three cubits, having both room and nourishment.

The fig would seem, one may say, to have the longest roots, and in general plants which have wood of loose texture and straight roots would seem to have these longer. Also young plants, provided that they have reached their prime, root deeper and have longer roots than old ones; for the roots decay along with [7] the rest of the plant's body. And in all cases alike the juices of plants [8] are more powerful in the roots than in other parts, while in some cases they are extremely powerful; wherefore the roots are bitter in some plants whose fruits are sweet; some roots again are medicinal, and some are fragrant, as those of the iris.

The character and function of the roots of the 'Indian fig' (banyan) are peculiar, for this plant sends out roots from the shoots till it has a hold on the ground [9] and roots again; and so there comes to be a continuous circle of roots round the tree, not connected with the main stem but at a distance from it.

[8] *τοῖς φυτοῖς* Ald.; *ταῖς ῥίζαις* conj. W. from G: text probably defective.

[9] *τῇ γῇ* conj. Scal. from G; *συκῇ* U; *τῇ συκῇ* P_2Ald.

Παραπλήσιον δὲ τούτῳ μᾶλλον δὲ τρόπον τινὰ θαυμασιώτερον εἴ τι ἐκ τῶν φύλλων ἀφίησι ῥίζαν, οἷόν φασι περὶ Ὀποῦντα ποιάριον εἶναι, ὃ καὶ ἐσθίεσθαί ἐστιν ἡδύ. τὸ γὰρ αὖ τῶν θέρμων θαυμαστὸν ἧττον, ὅτι ἂν ἐν ὕλῃ βαθείᾳ σπαρῇ διείρει τὴν ῥίζαν πρὸς τὴν γῆν καὶ βλαστάνει διὰ τὴν ἰσχύν. ἀλλὰ δὴ τὰς μὲν τῶν ῥιζῶν διαφορὰς ἐκ τούτων θεωρητέον.

VIII. Τῶν δένδρων τὰς τοιαύτας ἄν τις λάβοι διαφοράς. ἔστι γὰρ τὰ μὲν ὀζώδη τὰ δ' ἄνοζα καὶ φύσει καὶ τόπῳ κατὰ τὸ μᾶλλον καὶ ἧττον. ἄνοζα δὲ λέγω οὐχ ὥστε μὴ ἔχειν ὅλως—οὐδὲν γὰρ τοιοῦτο δένδρον, ἀλλ' εἴπερ, ἐπὶ τῶν ἄλλων οἷον σχοῖνος τύφη κύπειρος ὅλως ἐπὶ τῶν λιμνωδῶν—ἀλλ' ὥστε ὀλίγους ἔχειν. φύσει μὲν οἷον ἀκτὴ δάφνη συκῆ ὅλως πάντα τὰ λειόφλοια καὶ ὅσα κοῖλα καὶ μανά. ὀζῶδες δὲ ἐλάα πεύκη κότινος· τούτων δὲ τὰ μὲν ἐν παλισκίοις καὶ νηνέμοις καὶ ἐφύδροις, τὰ δὲ ἐν εὐηλίοις καὶ χειμερίοις καὶ πνευματώδεσι καὶ λεπτοῖς καὶ ξηροῖς· τὰ μὲν γὰρ ἀνοζότερα, τὰ δὲ ὀζωδέστερα τῶν

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[1] τι conj. W.; τις MSS. [2] Plin. 21. 104.
[3] *cf.* 8. 11. 8; Plin. 18. 133 and 134.
[4] διείρει conj. Sch.; διαιρεῖ P_2Ald.; *cf. C.P.* 2. 17. 7.
[5] ὄζος is the knot and the bough starting from it: *cf.* Arist. *de iuv. et sen.* 3.
[6] ἐπὶ τῶν conj. Coraës; ἡ τῶν UM; ἧττον (erased) P (ἐκ τῶν marg.) ἧττον Ald.

Something similar to this, but even more surprising, occurs in those plants which[1] emit roots from their leaves, as they say does a certain herb[2] which grows about Opus, which is also sweet to taste. The peculiarity again of lupins[3] is less surprising, namely that, if the seed is dropped where the ground is thickly overgrown, it pushes[4] its root through to the earth and germinates because of its vigour. But we have said enough for study of the differences between roots.

Of trees (principally) and their characteristic special differences: as to knots.

VIII. One may take it that the following are the differences between trees:—Some have knots,[5] more or less, others are more or less without them, whether from their natural character or because of their position. But, when I say 'without knots,' I do not mean that they have no knots at all (there is no tree like that, but, if it is true of any plants, it is only of[6] other kinds, such as rush bulrush[7] galingale and plants of the lake side[8] generally) but that they have few knots. Now this is the natural character of elder bay fig and all smooth-barked trees, and in general of those whose wood is hollow or of a loose texture. Olive fir and wild olive have knots; and some of these grow in thickly shaded windless and wet places, some in sunny positions exposed to storms and winds,[9] where the soil is light and dry; for the number of knots varies between trees of the

[7] *τύφη* conj. Bod.; *τίφη* UAld.H.; *cf.* 1. 5. 3.
[8] *ἐπὶ τῶν* conj. W.; *εἴ τι ἐπὶ τῶν* Ald.
[9] *πνευματώδεσι* conj. Scal.; *πυματώδεσι* U; *πυγματώδεσι* MVAld.

ὁμογενῶν. ὅλως δὲ ὀζωδέστερα τὰ ὀρεινὰ τῶν πεδεινῶν καὶ τὰ ξηρὰ τῶν ἐλείων.

2 Ἔτι δὲ κατὰ τὴν φυτείαν τὰ μὲν πυκνὰ ἄνοζα καὶ ὀρθά, τὰ δὲ μανὰ ὀζωδέστερα καὶ σκολιώτερα· συμβαίνει γὰρ ὥστε τὰ μὲν ἐν παλισκίῳ εἶναι τὰ δὲ ἐν εὐηλίῳ. καὶ τὰ ἄρρενα δὲ τῶν θηλειῶν ὀζωδέστερα ἐν οἷς ἐστιν ἄμφω, οἷον κυπάριττος ἐλάτη ὀστρυῖς κρανεία· καλοῦσι γὰρ γένος τι θηλυκρανείαν· καὶ τὰ ἄγρια δὲ τῶν ἡμέρων, καὶ ἁπλῶς καὶ τὰ ὑπὸ ταὐτὸ γένος, οἷον κότινος ἐλάας καὶ ἐρινεὸς συκῆς καὶ ἀχρὰς ἀπίου. πάντα γὰρ ταῦτα ὀζωδέστερα· καὶ ὡς ἐπὶ τὸ πολὺ πάντα τὰ πυκνὰ τῶν μανῶν· καὶ γὰρ τὰ ἄρρενα πυκνότερα καὶ τὰ ἄγρια· πλὴν εἴ τι διὰ πυκνότητα παντελῶς ἄνοζον ἢ ὀλίγοζον, οἷον πύξος λωτός.

3 Εἰσὶ δὲ τῶν μὲν ἄτακτοι καὶ ὡς ἔτυχεν οἱ ὄζοι, τῶν δὲ τεταγμένοι καὶ τῷ διαστήματι καὶ τῷ πλήθει καθάπερ εἴρηται· δι' ὃ καὶ ταξιόζωτα ταῦτα καλοῦσιν. τῶν μὲν γὰρ οἷον δι' ἴσου τῶν δὲ μεῖζον αἰεὶ τὸ πρὸς τῷ πάχει. καὶ τοῦτο κατὰ λόγον. ὅπερ μάλιστα ἔνδηλον καὶ ἐν τοῖς κοτίνοις καὶ ἐν τοῖς καλάμοις· τὸ γὰρ γόνυ καθάπερ ὄζος. καὶ οἱ μὲν κατ' ἀλλήλους, ὥσπερ οἱ τῶν

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[1] Plin. 16. 125. [2] 1. 8. 1.
[3] ταξιόζωτα conj. W.; ἀξιολογώτατα Ald.; *cf.* ταξίφυλλος, 1. 10. 8. [4] Plin. 16. 122.

same kind. And in general mountain trees have more knots than those of the plain, and those that grow in dry spots than those that grow in marshes.

Again the way in which they are planted makes a difference in this respect; those trees that grow close together are knotless and erect, those that grow far apart have more knots and a more crooked growth; for it happens that the one class are in shade, the others in full sun. Again the 'male' trees have more knots than the 'female' in those trees in which both forms are found, as cypress silver-fir hop-hornbeam cornelian cherry—for there is a kind called 'female cornelian cherry' (cornel)—and wild trees have more knots than trees in cultivation: this is true both in general and when we compare those of the same kind, as the wild and cultivated forms of olive fig and pear. All these have more knots in the wild state; and in general those of closer growth have this character more than those of open growth; for in fact the 'male' plants are of closer growth, and so are the wild ones; except that in some cases, as in box and nettle-tree, owing to the closer growth there are no knots at all, or only a few.

[1] Again the knots of some trees are irregular and set at haphazard, while those of others are regular, alike in their distance apart and in their number, as has been said[2]; wherefore also they are called 'trees with regular knots.'[3] [4] For of some the knots are, as it were, at even distances, while in others the distance between them is greater at the thick end of the stem. And this proportion holds throughout. This is especially evident in the wild olive and in reeds—in which the joint corresponds to the knot in trees. Again some knots are opposite one another,

κοτίνων, οἱ δ' ὡς ἔτυχεν. ἔστι δὲ τὰ μὲν δίοζα, τὰ δὲ τρίοζα, τὰ δὲ πλείους ἔχοντα· ἔνια δὲ πεντάοζά ἐστι. καὶ τῆς μὲν ἐλάτης ὀρθοὶ καὶ οἱ ὄζοι καὶ οἱ
4 κλάδοι ὥσπερ ἐμπεπηγότες, τῶν δὲ ἄλλων οὔ. δι' ὃ καὶ ἰσχυρὸν ἡ ἐλάτη. ἰδιώτατοι δὲ οἱ τῆς μηλέας· ὅμοιοι γὰρ θηρίων προσώποις, εἷς μὲν ὁ μέγιστος ἄλλοι δὲ περὶ αὐτὸν μικροὶ πλείους. εἰσὶ δὲ τῶν ὄζων οἱ μὲν τυφλοί, οἱ δὲ γόνιμοι. λέγω δὲ τυφλοὺς ἀφ' ὧν μηδεὶς βλαστός. οὗτοι δὲ καὶ φύσει καὶ πηρώσει γίνονται, ὅταν ἢ μὴ λυθῇ καὶ ἐκβιάζηται ἢ καὶ ἀποκοπῇ καὶ οἷον ἐπικαυθεὶς πηρωθῇ· γίνονται δὲ μᾶλλον ἐν τοῖς παχέσι τῶν ἀκρεμόνων, ἐνίων δὲ καὶ ἐν τοῖς στελέχεσιν. ὅλως δὲ καὶ τοῦ στελέχους καὶ τοῦ κλάδου καθ' ὃ ἂν ἐπικόψῃ ἢ ἐπιτέμῃ τις, ὄζος γίνεται καθαπερανεὶ διαιρῶν τὸ ἓν καὶ ποιῶν ἑτέραν ἀρχήν, εἴτε διὰ τὴν πήρωσιν εἴτε δι' ἄλλην αἰτίαν· οὐ γὰρ δὴ κατὰ φύσιν τὸ ὑπὸ τῆς πληγῆς.

5 Αἰεὶ δὲ ἐν ἅπασιν οἱ κλάδοι φαίνονται πολυοζότεροι διὰ τὸ μήπω τἀνὰ μέσον προσηυξῆσθαι, καθάπερ καὶ τῆς συκῆς οἱ νεόβλαστοι τραχύτατοι καὶ τῆς ἀμπέλου τὰ ἄκρα τῶν κλημάτων. ὡς γὰρ ὄζος ἐν τοῖς ἄλλοις οὕτω καὶ ὀφθαλμὸς

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[1] *cf.* 4. 4. 12. [2] Plin. 16. 122.
[3] *i.e.* primary and secondary branches.
[4] *cf.* 5. 2. 2. [5] Plin. 16. 124.
[6] *cf.* Arist. *de inv. et sen.* 3; Plin. 16. 125.
[7] ὅταν . . . πηρωθῇ conj. W.; ἢ ὅταν ἡ μὴ λυθῇ καὶ ἐκβιάζηται καὶ ἡ ἀποκοπὴ καί U; ὅταν ἢ μὴ λυθῇ καὶ ἐκβιάζηται ἢ ἀποκοπῇ P; ἢ ὅταν λυθῇ καὶ ἐκβιάζηται ἢ ἀποκοπὴ καὶ οἱ οὐ P_2; ὅταν ἢ μὴ λυθῇ καὶ ἐκβιάζηται καὶ ἢ ἀποκοπῇ καὶ Ald.H.; G differs widely.

as those of the wild olive, while others are set at random. Again some trees have double knots, some treble,[1] some more at the same point; some have as many as five. [2] In the silver-fir both the knots and the smaller branches[3] are set at right angles, as if they were stuck in, but in other trees they are not so. And that is why the silver-fir is such a strong tree.[4] Most peculiar[5] are the knots of the apple, for they are like the faces of wild animals; there is one large knot, and a number of small ones round it. Again some knots are blind,[6] others productive; by 'blind' I mean those from which there is no growth. These come to be so either by nature or by mutilation, according as either the knot[7] is not free and so the shoot does not make its way out, or, a bough having been cut off, the place is mutilated, for example by burning. Such knots occur more commonly in the thicker boughs, and in some cases in the stem also. And in general, wherever one chops or cuts part of the stem or bough, a knot is formed, as though one thing were made thereby into two and a fresh growing point produced, the cause being the mutilation or some other such reason; for the effect of such a blow cannot of course be ascribed to nature.

Again in all trees the branches always seem to have more knots, because the intermediate parts[8] have not yet developed, just as the newly formed branches of the fig are the roughest,[9] and in the vine the highest[10] shoots. [11] (For to the knot in other

[8] *i.e.* the internodes; till the branch is fully grown its knots are closer together, and so seem more numerous: *μήπω τἀνὰ μέσον προσηυξῆσθαι* conj. Sch.; *μήπω τἀνὰ μέσον προσκυζῆθαι* U; *μήτ' ἀνὰ μέσον προσκυζεῖσθαι* MAld.; *μήποτ' ἀνάμεσον προσηυξῆσθαι* P_2.

[9] *i.e.* have most knots.

[10] *i.e.* youngest.

[11] Plin. 16. 125.

ἐν ἀμπέλῳ καὶ ἐν καλάμῳ γόνυ . . . ἐνίοις δὲ καὶ οἷον κράδαι γίνονται, καθάπερ πτελέᾳ καὶ δρυῒ καὶ μάλιστα ἐν πλατάνῳ· ἐὰν δὲ ἐν τραχέσι καὶ ἀνύδροις καὶ πνευματώδεσι καὶ παντελῶς. πάντως δὲ πρὸς τῇ γῇ καὶ οἷον τῇ κεφαλῇ τοῦ στελέχους ἀπογηρασκόντων τὸ πάθος τοῦτο γίνεται.

6 Ἔνια δὲ καὶ ἴσχει τοὺς καλουμένους ὑπό τινων ἢ γόγγρους ἢ τὸ ἀνάλογον, οἷον ἡ ἐλάα· κυριώτατον γὰρ ἐπὶ ταύτης τοῦτο τοὔνομα καὶ πάσχειν δοκεῖ μάλιστα τὸ εἰρημένον· καλοῦσι δ' ἔνιοι τοῦτο πρέμνον οἱ δὲ κροτώνην οἱ δὲ ἄλλο ὄνομα. τοῖς δὲ εὐθέσι καὶ μονορρίζοις καὶ ἀπαραβλάστοις οὐ γίνεται τοῦθ' ὅλως ἢ ἧττον· [φοῖνιξ δὲ παραβλαστητικόν·] ἡ δὲ ἐλάα καὶ ὁ κότινος καὶ τὰς οὐλότητας ἰδίας ἔχουσι τὰς ἐν τοῖς στελέχεσι.

IX. Ἔστι μὲν οὖν τὰ μὲν ὡς εἰς μῆκος αὐξητικὰ μάλιστ' ἢ μόνον, οἷον ἐλάτη φοῖνιξ κυπάριττος καὶ ὅλως τὰ μονοστελέχη καὶ ὅσα μὴ πολύρριζα μηδὲ πολύκλαδα· <ἡ δὲ φοῖνιξ ἀπαραβλαστητικόν·> τὰ δὲ ὁμοῖα τούτοις ἀνὰ λόγον καὶ εἰς βάθος. ἔνια δ' εὐθὺς σχίζεται, οἷον ἡ

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[1] The opening of the description of the diseases of trees seems to have been lost. [2] κράδαι; *cf. C.P.* 5. 1. 3.

[3] πάντως . . . γίνεται conj. W.; πάντως δὲ ὁ πρὸς τῇ γῇ καὶ οἷον τ. κ. στ. ἀπογηράσκων τῶν παχυτέρων γίνεται Ald.; so U except παχύτερον, and M except παχύτερος.

[4] γόγγρους: *cf.* Hesych., *s.vv.* γόγγρος, κροτώνη.

[5] The word is otherwise unknown.

[6] ἧττον· ἡ δὲ ἐλάα conj. W.; ἧττον· ἡ δὲ φοῖνιξ πάραβλαστητικόν· ἡ δὲ ἐλάα U; so Ald. except παραβλαστικόν. The

trees correspond the 'eye' in the vine, the joint in the reed). . . . .[1] In some trees again there occurs, as it were, a diseased formation of small shoots,[2] as in elm oak and especially in the plane; and this is universal if they grow in rough waterless or windy spots. Apart from any such cause[3] this affection occurs near the ground in what one may call the 'head' of the trunk, when the tree is getting old.

Some trees again have what are called by some 'excrescences'[4] (or something corresponding), as the olive; for this name belongs most properly to that tree, and it seems most liable to the affection; and some call it 'stump,' some *krotone*,[5] others have a different name for it. It does not occur, or only occurs to a less extent, in straight young trees, which have a single root and no side-growths. To the olive[6] also, both wild and cultivated, are peculiar certain thickenings[7] in the stem.

As to habit.

IX. [8] Now those trees which grow chiefly or only[9] in the direction of their height are such as silver-fir date-palm cypress, and in general those which have a single stem and not many roots or branches (the date-palm, it may be added, has no side-growths at all[10]). And trees like[11] these have also similar growth downwards. Some however divide from the first,

note about the palm (*φοῖνιξ δὲ παραβλαστητικόν*) I have omitted as untrue as well as irrelevant; possibly with *ἀπαραβα.* for *παραβα.* it belongs to the next section.

[7] *οὐλότητας* conj. W.; *κοιλότητας* MSS. (?) Ald.

[8] Plin. 16. 125.

[9] *μάλιστ' ἢ μόνον* conj. W.; *μάλιστα μανὰ* Ald. H.

[10] See 3. S. 6. n.

[11] *ὅμοια* conj. Sch.; *ὁμοίως* MSS. Sense hardly satisfactory.

μηλέα· τὰ δὲ πολύκλαδα καὶ μείζω τὸν ὄγκον ἔχει τὸν ἄνω, καθάπερ ῥόα· οὐ μὴν ἀλλ' οὖν[1] μέγιστά γε συμβάλλεται πρὸς ἕκαστον ἡ ἀγωγὴ καὶ ὁ τόπος καὶ ἡ τροφή. σημεῖον δ' ὅτι ταὐτὰ πυκνὰ μὲν ὄντα μακρὰ καὶ λεπτὰ γίνεται, μανὰ δὲ παχύτερα καὶ βραχύτερα· καὶ ἐὰν μὲν εὐθύς τις ἀφιῇ τοὺς ὄζους βραχέα, ἐὰν δὲ ἀνακαθαίρῃ μακρά, καθάπερ ἡ ἄμπελος.

2 Ἱκανὸν δὲ κἀκεῖνο πρὸς πίστιν ὅτι καὶ τῶν λαχάνων ἔνια λαμβάνει δένδρου σχῆμα, καθάπερ εἴπομεν τὴν μαλάχην καὶ τὸ τεῦτλον· ἅπαντα δ' ἐν τοῖς οἰκείοις τόποις εὐαυξῆ . . . καὶ τὸ αὐτὸ κάλλιστον.[3] ἐπεὶ καὶ τῶν ὁμογενῶν ἀνοζότερα καὶ μείζω καὶ καλλίω τὰ ἐν τοῖς οἰκείοις, οἷον ἐλάτη ἡ Μακεδονικὴ τῆς Παρνασίας καὶ τῶν ἄλλων. ἅπαντα δὲ ταῦτα καὶ ὅλως ἡ ὕλη ἡ ἀγρία καλλίων καὶ πλείων τοῦ ὄρους ἐν τοῖς προσβορείοις ἢ ἐν τοῖς πρὸς μεσημβρίαν.

3 Ἔστι δὲ τὰ μὲν ἀείφυλλα τὰ δὲ φυλλοβόλα. τῶν μὲν ἡμέρων ἀείφυλλα ἐλάα φοῖνιξ δάφνη μύρρινος πεύκης τι γένος κυπάριττος· τῶν δ' ἀγρίων ἐλάτη πεύκη ἄρκευθος μίλος[6] θυία καὶ ἣν Ἀρκάδες καλοῦσι φελλόδρυν φιλυρέα κέδρος πίτυς ἀγρία μυρίκη πύξος πρῖνος κήλαστρον φιλύκη ὀξυάκανθος ἀφάρκη, ταῦτα δὲ φύεται περὶ τὸν Ὄλυμπον, ἀνδράχλη κόμαρος τέρμινθος

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[1] οὖν marked as doubtful in U. [2] 1. 3. 2.

[3] καὶ τὸ αὐτὸ κάλλιστον. The first part of the sentence to which these words belong is apparently lost (W.).

[4] *i.e.* the fir and other trees mentioned in the lost words.

[5] Plin. 16. 80.

[6] μίλος conj. Sch.; σμίλαξ P_2Ald.; *cf.* 3. 3. 3.

such as apple; some have many branches, and their greater mass of growth high up, as the pomegranate: however[1] training position and cultivation chiefly contribute to all of these characters. In proof of which we have the fact that the same trees which, when growing close together, are tall and slender, when grown farther apart become stouter and shorter; and if we from the first let the branches grow freely, the tree becomes short, whereas, if we prune them, it becomes tall,—for instance, the vine.

This too is enough for proof that even some pot-herbs acquire the form of a tree, as we said[2] of mallow and beet. Indeed all things grow well in congenial places. . . .[3] For even among those of the same kind those which grow in congenial places have less knots, and are taller and more comely: thus the silver-fir in Macedon is superior to other silver-firs, such as that of Parnassus. Not only is this true of all these,[4] but in general the wild woodland is more beautiful and vigorous on the north side of the mountain than on the south.

As to shedding of leaves.

Again some[5] trees are evergreen, some deciduous. Of cultivated trees, olive date-palm bay myrtle a kind of fir and cypress are evergreen, and among wild trees silver-fir fir Phoenician cedar yew[6] odorous cedar the tree which the Arcadians call 'cork-oak' (holm-oak) mock-privet prickly cedar 'wild[7] pine' tamarisk box kermes-oak holly alaternus cotoneaster hybrid arbutus[8] (all of which grow about Olympus)

[7] *ἀγρία* after *πίτυς* conj. Sch.; after *πρῖνος* UPAld.: *cf.* 3. 3. 3.

[8] *κόμαρος* conj. Bod.; *σίναρος* UMV; *οἴναρος* Ald.; *σύναρος* P_2.

ἀγρία δάφνη. δοκεῖ δ' ἡ ἀνδράχλη καὶ ὁ κόμαρος τὰ μὲν κάτω φυλλοβολεῖν τὰ δὲ ἔσχατα τῶν ἀκρεμόνων ἀείφυλλα ἔχειν, ἐπιφύειν δὲ ἀεὶ τοὺς ἀκρεμόνας.

4 Τῶν μὲν οὖν δένδρων ταῦτα. τῶν δὲ θαμνωδῶν κιττὸς βάτος ῥάμνος κάλαμος κεδρίς· ἔστι γάρ τι μικρὸν ὃ οὐ δενδροῦται. τῶν δὲ φρυγανικῶν καὶ ποιωδῶν πήγανον ῥάφανος ῥοδωνία ἰωνία ἀβρότονον ἀμάρακον ἔρπυλλος ὀρίγανον σέλινον ἱπποσέλινον μήκων καὶ τῶν ἀγρίων εἴδη πλείω. διαμένει δὲ καὶ τούτων ἔνια τοῖς ἄκροις τὰ δὲ ἄλλα ἀποβάλλει οἷον ὀρίγανον σέλινον . . . ἐπεὶ καὶ τὸ πήγανον κακοῦται καὶ ἀλλάττεται.

5 Πάντα δὲ καὶ τῶν ἄλλων τὰ ἀείφυλλα στενοφυλλότερα καὶ ἔχοντά τινα λιπαρότητα καὶ εὐωδίαν. ἔνια δ' οὐκ ὄντα τῇ φύσει παρὰ τὸν τόπον ἐστὶν ἀείφυλλα, καθάπερ ἐλέχθη περὶ τῶν ἐν Ἐλεφαντίνῃ καὶ Μέμφει· κατωτέρω δ' ἐν τῷ Δέλτα μικρὸν πάνυ χρόνον διαλείπει τοῦ μὴ ἀεὶ βλαστάνειν. ἐν Κρήτῃ δὲ λέγεται πλάτανόν τινα εἶναι ἐν τῇ Γορτυναίᾳ πρὸς πηγῇ τινι ἣ οὐ φυλλοβολεῖ· μυθολογοῦσι δὲ ὡς ὑπὸ ταύτῃ ἐμίγη τῇ Εὐρώπῃ ὁ Ζεύς· τὰς δὲ πλησίας πάσας φυλλοβολεῖν. ἐν δὲ Συβάρει δρῦς ἐστιν εὐσύνοπτος ἐκ τῆς πόλεως ἣ οὐ φυλλοβολεῖ· φασὶ

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[1] Plin. 16. 80.
[2] Some words probably missing (W.) which would explain the next two clauses. [3] Plin. 16. 82. [4] 1. 3. 5.
[5] Plin. 12. 11 ; Varro, 1. 7.

andrachne arbutus terebinth 'wild bay' (oleander). Andrachne and arbutus seem to cast their lower leaves, but to keep those at the end of the twigs perennially, and to be always adding leafy twigs. These are the trees which are evergreen.

[1] Of shrubby plants these are evergreen:—ivy bramble buckthorn reed *kedris* (juniper)—for there is a small kind of *kedros* so called which does not grow into a tree. Among under-shrubs and herbaceous plants there are rue cabbage rose gilliflower southernwood sweet marjoram tufted thyme marjoram celery alexanders poppy, and a good many more kinds of wild plants. However some of these too, while evergreen as to their top growths, shed their other leaves, as marjoram and celery . . . . . .[2] for rue too is injuriously affected and changes its character.

[3] And all the evergreen plants in the other classes too have narrower leaves and a certain glossiness and fragrance. Some moreover which are not evergreen by nature become so because of their position, as was said[4] about the plants at Elephantine and Memphis, while lower down the Nile in the Delta there is but a very short period in which they are not making new leaves. It is said that in Crete[5] in the district of Gortyna there is a plane near a certain spring[6] which does not lose its leaves; (indeed the story is that it was under[7] this tree that Zeus lay with Europa), while all the other plants in the neighbourhood shed their leaves. [8] At Sybaris there is an oak within sight of the city which does not shed

[6] πηγῇ conj. H. from G; σκηνῇ UMVAld.; κηνῇ P_2; κρηνῇ mBas.

[7] ὑπὸ conj. Hemsterhuis; ἐπὶ Ald. [8] Plin. 16. 81.

δὲ οὐ βλαστάνειν αὐτὴν ἅμα ταῖς ἄλλαις ἀλλὰ μετὰ Κύνα. λέγεται δὲ καὶ ἐν Κύπρῳ πλάτανος εἶναι τοιαύτη.

6 Φυλλοβολεῖ δὲ πάντα τοῦ μετοπώρου καὶ μετὰ τὸ μετόπωρον, πλὴν τὸ μὲν θᾶττον τὸ δὲ βραδύτερον ὥστε καὶ τοῦ χειμῶνος ἐπιλαμβάνειν. οὐκ ἀνάλογοι δὲ αἱ φυλλοβολίαι ταῖς βλαστήσεσιν, ὥστε τὰ πρότερον βλαστήσαντα πρότερον φυλλοβολεῖν, ἀλλ' ἔνια πρωϊβλαστεῖ μὲν οὐδὲν δὲ προτερεῖ τῶν ἄλλων, ἀλλά τινων καὶ ὑστερεῖ, καθάπερ ἡ ἀμυγδαλῆ.

7 Τὰ δὲ ὀψιβλαστεῖ μὲν οὐδὲν δὲ ὡς εἰπεῖν ὑστερεῖ τῶν ἄλλων, ὥσπερ ἡ συκάμινος. δοκεῖ δὲ καὶ ἡ χώρα συμβάλλεσθαι καὶ ὁ τόπος ὁ ἔνικμος πρὸς τὸ διαμένειν. τὰ γὰρ ἐν τοῖς ξηροῖς καὶ ὅλως λεπτογείοις πρότερα φυλλοβολεῖ καὶ τὰ πρεσβύτερα δὲ τῶν νέων. ἔνια δὲ καὶ πρὸ τοῦ πεπᾶναι τὸν καρπὸν ἀποβάλλει τὰ φύλλα, καθάπερ αἱ ὄψιαι συκαῖ καὶ ἀχράδες.

Τῶν δ' ἀειφύλλων ἡ ἀποβολὴ καὶ ἡ αὔανσις κατὰ μέρος· οὐ γὰρ δὴ ταὐτὰ αἰεὶ διαμένει, ἀλλὰ τὰ μὲν ἐπιβλαστάνει τὰ δ' ἀφαυαίνεται. τοῦτο δὲ περὶ τροπὰς μάλιστα γίνεται θερινάς. εἰ δέ τινων καὶ μετ' Ἀρκτοῦρον ἢ καὶ κατ' ἄλλην ὥραν ἐπισκεπτέον. καὶ τὰ μὲν περὶ τὴν φυλλοβολίαν οὕτως ἔχει.

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[1] Plin. 16. 82 and 83.

its leaves, and they say that it does not come into leaf along with the others, but only after the rising of the dog-star. It is said that in Cyprus too there is a plane which has the same peculiarity.

[1] The fall of the leaves in all cases takes place in autumn or later, but it occurs later in some trees than in others, and even extends into the winter. However the fall of the leaf does not correspond to the growth of new leaves (in which case those that come into leaf earlier would lose their leaves earlier), but some (such as the almond) which are early in coming into leaf are not earlier than the rest in losing their leaves, but are even comparatively late.[2]

[3] Others again, such as the mulberry, come into leaf late, but are hardly at all later than the others in shedding their leaves. It appears also that position and a moist situation conduce to keeping the leaves late; for those which grow in dry places, and in general where the soil is light, shed their leaves earlier, and the older trees earlier than young ones. Some even cast their leaves before the fruit is ripe, as the late kinds of fig and pear.

In those which are evergreen the shedding and withering of leaves take place by degrees; for it is not the same [4] leaves which always persist, but fresh ones are growing while the old ones wither away. This happens chiefly about the summer solstice. Whether in some cases it occurs even after the rising of Arcturus or at a quite different season is matter for enquiry. So much for the shedding of leaves.

[2] ὕστερεῖ conj. H.; ὕστερον UMVPAld.
[3] Plin. 16. 84.
[4] ταὐτὰ conj. Sch.; ταῦτα Ald.

X. Τὰ δὲ φύλλα τῶν μὲν ἄλλων δένδρων ὅμοια πάντων αὐτὰ ἑαυτοῖς, τῆς δὲ λεύκης καὶ τοῦ κιττοῦ καὶ τοῦ καλουμένου κρότωνος ἀνόμοια καὶ ἑτεροσχήμονα· τὰ μὲν γὰρ νέα περιφερῆ τὰ δὲ παλαιότερα γωνοειδῆ, καὶ εἰς τοῦτο ἡ μετάστασις πάντων. τοῦ δὲ κιττοῦ ἀνάπαλιν νέου μὲν ὄντος ἐγγωνιώτερα πρεσβυτέρου δὲ περιφερέστερα· μεταβάλλει γὰρ καὶ οὗτος. ἴδιον δὲ καὶ τὸ τῇ ἐλάᾳ καὶ τῇ φιλύρᾳ καὶ τῇ πτελέᾳ καὶ τῇ λεύκῃ συμβαῖνον· στρέφειν γὰρ δοκοῦσιν τὰ ὕπτια μετὰ τροπὰς θερινάς, καὶ τούτῳ γνωρίζουσιν ὅτι γεγένηνται τροπαί.
2 πάντα δὲ τὰ φύλλα διαφέρει κατὰ τὰ ὕπτια καὶ τὰ πρανῆ. καὶ τῶν μὲν ἄλλων τὰ ὕπτια ποιωδέστερα καὶ λειότερα· τὰς γὰρ ἴνας καὶ τὰς φλέβας ἐν τοῖς πρανέσιν ἔχουσιν, ὥσπερ ἡ χεὶρ <τὰ ἄρθρα>· τῆς δ' ἐλάας λευκότερα καὶ ἧττον λεῖα ἐνίοτε καὶ τὰ ὕπτια. πάντα δὴ ἢ τά γε πλεῖστα ἐκφανῆ ἔχει τὰ ὕπτια καὶ ταῦτα γίνεται τῷ ἡλίῳ φανερά. καὶ στρέφεται τὰ πολλὰ πρὸς τὸν ἥλιον· δι' ὃ καὶ οὐ ῥᾴδιον εἰπεῖν ὁπότερον πρὸς τῷ κλῶνι μᾶλλόν ἐστιν· ἡ μὲν γὰρ ὑπτιότης μᾶλλον δοκεῖ ποιεῖν τὸ πρανές, ἡ δὲ φύσις οὐχ ἧττον βούλεται τὸ ὕπτιον, ἄλλως τε καὶ ἡ ἀνάκλασις διὰ τὸν ἥλιον· ἴδοι δ'

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[1] Plin. 16. 85.

[2] καὶ τοῦ κιττοῦ καὶ τοῦ MSS. *cf.* Plin. *l.c.*; Diosc. 4. 164. καὶ τοῦ κικίου τοῦ καὶ conj. W.; Galen, *Lex. Hipp.*, gives κίκιον as a name for the root of κρότων. *cf. C.P.* 2. 16. 4.

[3] *i.e.* not 'entire.' 'Young leaves' = leaves of the young tree.

[4] This seems to contradict what has just been said.

[5] τὰ ἄρθρα add. Sch. from Plin. 16. 88, *incisuras*. *cf.* Arist. *H.A.* 1. 15, where Plin. (11. 274) renders ἄρθρα *incisuras*.

Differences in leaves.

X. [1] Now, while the leaves of all other trees are all alike in each tree, those of the abele ivy [2] and of the plant called *kroton* (castor-oil plant) are unlike one another and of different forms. The young leaves in these are round, the old ones angular,[3] and eventually all the leaves assume that form. On the other hand [4] in the ivy, when it is young, the leaves are somewhat angular, but when it is older, they become rounder: for in this plant too a change of form takes place. There is a peculiarity special to the olive lime elm and abele: their leaves appear to invert the upper surface after the summer solstice, and by this men know that the solstice is past. Now all leaves differ as to their upper and under surfaces; and in most trees the upper surfaces are greener and smoother, as they have the fibres and veins in the under surfaces, even as the human hand has its 'lines,'[5] but even the upper surface of the leaf of the olive is sometimes whiter and less smooth.[6] So all or most leaves display their upper surfaces, and it is these surfaces which are exposed to the light.[7] Again most leaves turn towards the sun; wherefore also it is not easy to say which surface is next to the twig[8]; for, while the way in which the upper surface is presented seems rather to make the under surface closer to it, yet nature desires equally that the upper surface should be the nearer, and this is specially seen in the turning back[9] of the leaf towards the sun. One

[6] *ἐνίοτε καὶ τὰ ὕπτια* conj. W.; *λεῖα δὲ καὶ τὰ τοῦ κιττοῦ* MSS. A makeshift correction of an obscure passage.

[7] *cf.* Plin. *l.c.* [8] *i.e.* is the under one.

[9] Whereby the under surface is exposed to it: see above.

ἄν τις ὅσα πυκνὰ καὶ κατ' ἄλληλα, καθάπερ τὰ τῶν μυρρίνων.

3 Οἴονται δέ τινες καὶ τὴν τροφὴν τῷ ὑπτίῳ διὰ τοῦ πρανοῦς εἶναι, διὰ τὸ ἔνικμον ἀεὶ τοῦτο καὶ χνοώδες εἶναι, οὐ καλῶς λέγοντες. ἀλλὰ τοῦτο μὲν ἴσως συμβαίνει χωρὶς τῆς ἰδίας φύσεως καὶ διὰ τὸ μὴ ὁμοίως ἡλιοῦσθαι, ἡ δὲ τροφὴ διὰ τῶν φλεβῶν ἢ ἰνῶν ὁμοίως ἀμφοτέροις· ἐκ θατέρου δ' εἰς θάτερον οὐκ εὔλογον μὴ ἔχουσι πόρους μηδὲ βάθος δι' οὗ· ἀλλὰ περὶ μὲν τροφῆς διὰ τίνων ἕτερος λόγος.

4 Διαφέρουσι δὲ καὶ τὰ φύλλα πλείοσι διαφοραῖς· τὰ μὲν γάρ ἐστι πλατύφυλλα, καθάπερ ἄμπελος συκῆ πλάτανος, τὰ δὲ στενόφυλλα, καθάπερ ἐλάα ῥόα μύρρινος· τὰ δ' ὥσπερ ἀκανθόφυλλα, καθάπερ πεύκη πίτυς κέδρος· τὰ δ' οἷον σαρκόφυλλα· τοῦτο δ' ὅτι σαρκῶδες ἔχουσι τὸ φύλλον, οἷον κυπάριττος μυρίκη μηλέα, τῶν δὲ φρυγανικῶν κνέωρος στοιβὴ καὶ ποιωδῶν ἀείζωον πόλιον· [τοῦτο δὲ καὶ πρὸς τοὺς σῆτας τοὺς ἐν τοῖς ἱματίοις ἀγαθόν·] τὰ γὰρ αὖ τῶν τευτλίων ἢ ῥαφάνων ἄλλον τρόπον σαρκώδη καὶ τὰ τῶν πηγανίων καλουμένων· ἐν πλάτει γὰρ καὶ οὐκ ἐν στρογγυλότητι τὸ σαρκῶδες. καὶ τῶν θαμνωδῶν
5 δὲ ἡ μυρίκη σαρκῶδες τὸ φύλλον ἔχει. ἔνια δὲ

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[1] *cf.* 1. 8. 3; 1. 10. 8; Plin. 16. 92.

[2] *ἐκ θατέρου δ' εἰς* conj. Sch. from G; *δὲ ἐκ θατέρου εἰς* with stop at *ἰνῶν* Ald. [3] *δι' οὗ* I conj.; *δι' ὧν* U.

[4] *ἀκανθόφυλλα* conj. W.; *σπανόφυλλα* UMAld.; *ἀνόφυλλα* P_2; *cf.* 3. 9. 5, whence Sch. conj. *τριχόφυλλα*: Plin. *l.c.* has *capillata pino cedro.*

[5] *μηλέα* probably corrupt; omitted by Plin. *l.c.*

may observe this in trees whose leaves are crowded and opposite,[1] such as those of myrtle.

Some think that the nourishment too is conveyed to the upper surface through the under surface, because this surface always contains moisture and is downy, but they are mistaken. It may be that this is not due to the trees' special character, but to their not getting an equal amount of sunshine, though the nourishment conveyed through the veins or fibres is the same in both cases. That it should be conveyed from one side to the other[2] is improbable, when there are no passages for it nor thickness for it to pass through.[3] However it belongs to another part of the enquiry to discuss the means by which nourishment is conveyed.

Again there are various other differences between leaves; some trees are broad-leaved, as vine fig and plane, some narrow-leaved, as olive pomegranate myrtle. Some have, as it were, spinous[4] leaves, as fir Aleppo pine prickly cedar; some, as it were, fleshy leaves; and this is because their leaves are of fleshy substance, as cypress tamarisk apple,[5] among under-shrubs *kneoros* and *stoibe*, and among herbaceous plants house-leek and hulwort. [6] This plant is good against moth in clothes. For the leaves of beet and cabbage are fleshy in another way, as are those of the various plants called rue; for their fleshy character is seen in the flat instead of in the round.[7] Among shrubby plants the tamarisk[8] has fleshy

[6] Probably a gloss.

[7] Or 'solid,' such leaves being regarded as having, so to speak, three, and not two dimensions. στρόγγυλος = 'thick-set' in Arist. *H.A.* 9. 44.

[8] μυρίκη probably corrupt; μ. was mentioned just above, among *trees*; ἐρείκη conj. Dalec.

καὶ καλαμόφυλλα, καθάπερ ὁ φοῖνιξ καὶ ὁ κόϊξ καὶ ὅσα τοιαῦτα· ταῦτα δὲ ὡς καθ' ὅλου εἰπεῖν γωνιόφυλλα· καὶ γὰρ ὁ κάλαμος καὶ ὁ κύπειρος καὶ ὁ βούτομος καὶ τἆλλα δὲ τῶν λιμνωδῶν τοιαῦτα· πάντα δὲ ὥσπερ ἐκ δυοῖν σύνθετα καὶ τὸ μέσον οἷον τρόπις, οὗ ἐν τοῖς ἄλλοις μέγας πόρος ὁ μέσος. διαφέρουσι δὲ καὶ τοῖς σχήμασι· τὰ μὲν γὰρ περιφερῆ, καθάπερ τὰ τῆς ἀπίου, τὰ δὲ προμηκέστερα, καθάπερ τὰ τῆς μηλέας· τὰ δὲ εἰς ὀξὺ προήκοντα καὶ παρακανθίζοντα, καθάπερ τὰ τοῦ μίλακος. καὶ ταῦτα μὲν ἄσχιστα· <τὰ δὲ σχιστὰ> καὶ οἷον πριονώδη, καθάπερ τὰ τῆς ἐλάτης καὶ τὰ τῆς πτερίδος· τρόπον δέ τινα σχιστὰ καὶ τὰ τῆς ἀμπέλου, καὶ τὰ τῆς συκῆς
6 δὲ ὥσπερ ἂν εἴποι τις κορωνοποδώδη. ἔνια δὲ καὶ ἐντομὰς ἔχοντα, καθάπερ τὰ τῆς πτελέας καὶ τὰ τῆς Ἡρακλεωτικῆς καὶ τὰ τῆς δρυός. τὰ δὲ καὶ παρακανθίζοντα καὶ ἐκ τοῦ ἄκρου καὶ ἐκ τῶν πλαγίων, οἷον τὰ τῆς πρίνου καὶ τὰ τῆς δρυὸς καὶ μίλακος καὶ βάτου καὶ παλιούρου καὶ τὰ τῶν ἄλλων. ἀκανθῶδες δὲ ἐκ τῶν ἄκρων καὶ τὸ τῆς πεύκης καὶ πίτυος καὶ ἐλάτης ἔτι δὲ κέδρου καὶ κεδρίδος. φυλλάκανθον δὲ ὅλως ἐν μὲν τοῖς δένδροις οὐκ ἔστιν οὐδὲν ὧν ἡμεῖς ἴσμεν, ἐν δὲ τοῖς ἄλλοις ὑλήμασίν ἐστιν, οἷον ἥ τε ἄκορνα καὶ ἡ δρυπὶς καὶ ὁ ἄκανος καὶ σχεδὸν ἅπαν τὸ τῶν ἀκανωδῶν γένος· ὥσπερ γὰρ φύλλον ἐστὶν ἡ ἄκανθα πᾶσιν· εἰ δὲ μὴ φύλλα τις ταῦτα θήσει,

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[1] Plin. *l.c.* and 13. 30. [2] *οὗ ἐν* conj. W.; *ὅθεν* Ald. H.
[3] *παρακανθίζοντα* conj. Sch.; *παραγωνίζοντα* UMVAld.
[4] *τὰ δὲ σχιστὰ* add. W.

leaves. Some again have reedy leaves, as date-palm doum-palm and such like. But, generally speaking, the leaves of these end in a point; for reeds galingale sedge and the leaves of other marsh plants are of this character. [1] The leaves of all these are compounded of two parts, and the middle is like a keel, placed where in[2] other leaves is a large passage dividing the two halves. Leaves differ also in their shapes; some are round, as those of pear, some rather oblong, as those of the apple; some come to a sharp point and have spinous projections[3] at the side, as those of smilax. So far I have spoken of undivided leaves; but some are divided[4] and like a saw, as those of silver-fir and of fern. To a certain extent those of the vine are also divided, while those of the fig one might compare to a crow's foot.[5] [6] Some leaves again have notches, as those of elm filbert and oak, others have spinous projections both at the tip and at the edges, as those of kermes-oak oak smilax bramble Christ's thorn and others. The leaf of fir Aleppo pine silver-fir and also of prickly cedar and *kedris* (juniper)[7] has a spinous point at the tip. Among other trees there is none that we know which has spines for leaves altogether, but it is so with other woody plants, as *akorna drypis* pine-thistle and almost all the plants which belong to that class.[8] For in all these spines, as it were, take the place of leaves, and, if one is not to reckon these

[3] *κορωνοποδώδη* conj. Gesner. The fig-leaf is compared to a crow's foot, Plut. *de defect. orac.* 3; *σκολοπώδη* Ald., which word is applied to thorns by Diosc. [6] Plin. 16. 90.

[7] *κεδρίδος* conj. Dalec.; *κεδρίας* MSS. *cf.* Plin. *l.c.*, who seems to have read *ἀγρίας*.

[8] *ἀκανωδῶν* conj. W., *cf.* I. 13. 3: *ἀκανθωδῶν* MSS.; *ἀκανθῶν* P_2.

συμβαίνοι ἂν ὅλως ἄφυλλα εἶναι, ἐνίοις δὲ ἄκανθαν μὲν εἶναι φύλλον δὲ ὅλως οὐκ ἔχειν, καθάπερ ὁ ἀσφάραγος.

7 Πάλιν δ' ὅτι τὰ μὲν ἄμισχα, καθάπερ τὰ τῆς σκίλλης καὶ τοῦ βολβοῦ, τὰ δ' ἔχοντα μίσχον. καὶ τὰ μὲν μακρόν, οἷον ἡ ἄμπελος καὶ ὁ κιττός, τὰ δὲ βραχὺν καὶ οἷον ἐμπεφυκότα, καθάπερ ἐλάα καὶ οὐχ ὥσπερ ἐπὶ τῆς πλατάνου καὶ ἀμπέλου προσηρτημένον. διαφορὰ δὲ καὶ τὸ μὴ ἐκ τῶν αὐτῶν εἶναι τὴν πρόσφυσιν, ἀλλὰ τοῖς μὲν πλείστοις ἐκ τῶν κλάδων τοῖς δὲ καὶ ἐκ τῶν ἀκρεμόνων, τῆς δρυὸς δὲ καὶ ἐκ τοῦ στελέχους, τῶν δὲ λαχανωδῶν τοῖς πολλοῖς εὐθὺς ἐκ τῆς ῥίζης, οἷον κρομύου σκόρδου κιχορίου, ἔτι δὲ ἀσφοδέλου σκίλλης βολβοῦ σισυριγχίου καὶ ὅλως τῶν βολβωδῶν· καὶ τούτων δὲ οὐχ ἡ πρώτη μόνον ἔκφυσις ἀλλὰ καὶ ὅλος ὁ καυλὸς ἄφυλλον. ἐνίων δ' ὅταν γένηται, φύλλα εἰκός, οἷον θριδακίνης ὠκίμου σελίνου καὶ τῶν σιτηρῶν ὁμοίως. ἔχει δ' ἔνια τούτων καὶ τὸν καυλὸν εἶτ' ἀκανθίζοντα, ὡς ἡ θριδακίνη καὶ τὰ φυλλάκανθα πάντα καὶ τῶν θαμνωδῶν δὲ καὶ ἔτι μᾶλλον, οἷον βάτος παλίουρος.

8 Κοινὴ δὲ διαφορὰ πάντων ὁμοίως δένδρων καὶ τῶν ἄλλων ὅτι τὰ μὲν πολύφυλλα τὰ δ' ὀλιγόφυλλα. ὡς δ' ἐπὶ τὸ πᾶν τὰ πλατύφυλλα ταξίφυλλα, καθάπερ μύρρινος, τὰ δ' ἄτακτα καὶ ὡς ἔτυχε, καθάπερ σχεδὸν τὰ πλεῖστα τῶν ἄλλων

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[1] Plin. 16. 91. [2] ἐπὶ conj. W.; ἡ Ald.H.
[3] ἐνίων . . . εἰκός. So Sch. explains: text probably defective.

as leaves, they would be entirely leafless, and some would have spines but no leaves at all, as asparagus.

[1] Again there is the difference that some leaves have no leaf-stalk, as those of squill and purse-tassels, while others have a leaf-stalk. And some of the latter have a long leaf-stalk, as vine and ivy, some, as olive, a short one which grows, as it were, into the stem and is not simply attached to it, as it is in [2] plane and vine. Another difference is that the leaves do not in all cases grow from the same part, but, whereas in most trees they grow from the branches, in some they grow also from the twigs, and in the oak from the stem as well; in most pot-herbs they grow directly from the root, as in onion garlic chicory, and also in asphodel squill purse-tassels Barbary-nut, and generally in plants of the same class as purse-tassels; and in these not merely the original growth but the whole stalk is leafless. In some, when the stalk is produced, the leaves may be expected to grow,[3] as in lettuce basil celery, and in like manner in cereals. In some of these the stalk presently becomes spinous, as in lettuce and the whole class of plants with spinous leaves, and still more in shrubby plants, as bramble and Christ's thorn.

[4] Another difference which is found in all trees alike and in other plants as well is that some have many, some few leaves. And in general those that have flat leaves[5] have them in a regular series, as myrtle, while in other instances the leaves are in no particular order, but set at random, as in most other

[4] Plin. 16. 92.

[5] *πλατύφυλλα* UVP; *πολύφυλλα* conj. W.; but *πλατύτης* is one of the 'differences' given in the summary below.

[ἦν]. ἴδιον δὲ ἐπὶ τῶν λαχανωδῶν, οἷον κρομύου γητείου, τὸ κοιλόφυλλον.

Ἁπλῶς δ' αἱ διαφοραὶ τῶν φύλλων ἢ μεγέθει ἢ πλήθει ἢ σχήματι ἢ πλατύτητι ἢ στενότητι ἢ κοιλότητι ἢ τραχύτητι ἢ λειότητι καὶ τῷ παρακανθίζειν ἢ μή. ἔτι δὲ κατὰ τὴν πρόσφυσιν ὅθεν ἢ δι' οὗ· τὸ μὲν ὅθεν, ἀπὸ ῥίζης ἢ κλάδου ἢ καυλοῦ ἢ ἀκρεμόνος· τὸ δὲ δι' οὗ, ἢ διὰ μίσχου ἢ δι' αὐτοῦ καὶ εἰ δὴ πολλὰ ἐκ τοῦ αὐτοῦ. καὶ ἔνια καρποφόρα, μεταξὺ περιειληφότα τὸν καρπόν, ὥσπερ ἡ Ἀλεξανδρεία δάφνη ἐπιφυλλόκαρπος.

Αἱ μὲν οὖν διαφοραὶ τῶν φύλλων κοινοτέρως πᾶσαι εἴρηνται καὶ σχεδόν εἰσιν ἐν τούτοις.

(Σύγκειται δὲ τὰ μὲν ἐξ ἰνὸς καὶ φλοιοῦ καὶ σαρκός, οἷον τὰ τῆς συκῆς καὶ τῆς ἀμπέλου, τὰ δὲ ὥσπερ ἐξ ἰνὸς μόνον, οἷον τοῦ καλάμου καὶ σίτου.
9 τὸ δὲ ὑγρὸν ἁπάντων κοινόν· ἅπασι γὰρ ἐνυπάρχει καὶ τούτοις καὶ τοῖς ἄλλοις τοῖς ἐπετείοις [μίσχος ἄνθος καρπὸς εἴ τι ἄλλο]· μᾶλλον δὲ καὶ τοῖς μὴ ἐπετείοις· οὐδὲν γὰρ ἄνευ τούτου. δοκεῖ δὲ καὶ τῶν μίσχων τὰ μὲν ἐξ ἰνῶν μόνον συγκεῖσθαι, καθάπερ τὰ τοῦ σίτου καὶ τοῦ καλάμου, τὰ δ' ἐκ τῶν αὐτῶν, ὥσπερ οἱ καυλοί.

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[1] τῶν ἄλλων ἦν MSS.; τῶν ποιωδῶν conj. W. ἦν, at all events, cannot be right. [2] Plin. 19. 100.

[3] ἢ στενότητι ἢ κοιλότητι : so G; ἢ κοιλότητι ἢ στενότητι MSS. [4] *i.e.* petiolate. [5] *i.e.* sessile.

[6] *i.e.* compound : εἰ δὴ conj. W.; εἴδη UMVAld.

[7] The passage from here to the end of the chapter is a digression.

plants.[1] [2] It is peculiar to pot-herbs to have hollow leaves, as in onion and horn-onion.

To sum up, the differences between leaves are shewn in size, number, shape, hollowness, in breadth,[3] roughness and their opposites, and in the presence or absence of spinous projections; also as to their attachment, according to the part from which they spring or the means by which they are attached; the part from which they spring being the root or a branch or the stalk or a twig, while the means by which they are attached may be a leaf-stalk,[4] or they may be attached directly;[5] and there may be[6] several leaves attached by the same leaf-stalk. Further some leaves are fruit-bearing, enclosing the fruit between them, as the Alexandrian laurel, which has its fruit attached to the leaves.

These are all the differences in leaves stated somewhat generally, and this is a fairly complete list of examples.

Composition of the various parts of a plant.

[7] (Leaves are composed some of fibre bark and flesh, as those of the fig and vine, some, as it were, of fibre alone, as those of reeds and corn. But moisture is common to all, for it is found both in leaves and in the other annual parts,[8] leaf-stalk, flower, fruit and so forth but more especially in the parts which are not annual[9]; in fact no part is without it. Again it appears that some leaf-stalks are composed only of fibre, as those of corn and reeds, some of the same materials as the stalks.

[8] *μίσχος . . . ἄλλο* has no construction; probably a (correct) gloss, taken from 1, 2, 1.

[9] *i.e.* while these are young, W.

10 Τῶν δ' ἀνθῶν τὰ μὲν ἐκ φλοιοῦ καὶ φλεβὸς καὶ σαρκός, <τὰ δ' ἐκ σαρκὸς> μόνον, οἷον τὰ ἐν μέσῳ τῶν ἄρων.

Ὁμοίως δὲ καὶ ἐπὶ τῶν καρπῶν· οἱ μὲν γὰρ ἐκ σαρκὸς καὶ ἰνός, οἱ δὲ ἐκ σαρκὸς μόνον, οἱ δὲ καὶ ἐκ δέρματος σύγκεινται· τὸ δὲ ὑγρὸν ἀκολουθεῖ καὶ τούτοις. ἐκ σαρκὸς μὲν καὶ ἰνὸς ὁ τῶν κοκκυμήλων καὶ σικύων, ἐξ ἰνὸς δὲ καὶ δέρματος ὁ τῶν συκαμίνων καὶ τῆς ῥόας. ἄλλοι δὲ κατ' ἄλλον τρόπον μεμερισμένοι. πάντων δὲ ὡς εἰπεῖν τὸ μὲν ἔξω φλοιὸς τὸ δ' ἐντὸς σὰρξ τῶν δὲ καὶ πυρήν.)

XI. Ἔσχατον δ' ἐν ἅπασι τὸ σπέρμα. τοῦτο δὲ ἔχον ἐν ἑαυτῷ σύμφυτον ὑγρὸν καὶ θερμόν, ὧν ἐκλιπόντων ἄγονα, καθάπερ τὰ ὠά. καὶ τῶν μὲν εὐθὺ τὸ σπέρμα μετὰ τὸ περιέχον, οἷον φοίνικος καρύου ἀμυγδάλης, πλείω δὲ τούτων τὰ ἐμπεριέχοντα, ὡς τὰ τοῦ φοίνικος. τῶν δὲ μεταξὺ σὰρξ καὶ πυρήν, ὥσπερ ἐλάας καὶ κοκκυμηλέας καὶ ἑτέρων. ἔνια δὲ καὶ ἐν λοβῷ, τὰ δ' ἐν ὑμένι, τὰ δ' ἐν ἀγγείῳ, τὰ δὲ καὶ γυμνόσπερμα τελείως.

2 Ἐν λοβῷ μὲν οὐ μόνον τὰ ἐπέτεια, καθάπερ τὰ χεδροπὰ καὶ ἕτερα πλείω τῶν ἀγρίων, ἀλλὰ καὶ τῶν δένδρων ἔνια, καθάπερ ἥ τε κερωνία, ἣν τινες καλοῦσι συκῆν Αἰγυπτίαν, καὶ ἡ κερκὶς καὶ ἡ κολοιτία περὶ Λιπάραν· ἐν ὑμένι δ' ἔνια τῶν

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[1] τὰ U; τὸ Ald.

[2] τὰ δ' ἐκ σαρκὸς preserved only in mBas.; om. UMVP$_2$. Sch. reads τὸ.

[3] ἄρων conj. W.; αἰρῶν MSS. [4] *i.e.* rind.

[5] Plin. 18. 53. [6] οὐ conj. Sch.; οὖν Ald.H.

Of flowers some[1] are composed of bark veins and flesh, some of flesh only,[2] as those in the middle of cuckoo-pint.[3]

So too with fruits; some are made of flesh and fibre, some of flesh alone, and some of skin[4] also. And moisture is necessarily found in these also. The fruit of plums and cucumbers is made of flesh and fibre, that of mulberries and pomegranates of fibre and skin. The materials are differently distributed in different fruits, but of nearly all the outside is bark, the inside flesh, and this in some cases includes a stone.)

Differences in seeds.

XI. Last in all plants comes the seed. This possesses in itself natural moisture and warmth, and, if these fail, the seeds are sterile, like eggs in the like case. In some plants the seed comes immediately inside the envelope, as in date filbert almond (however, as in the case of the date, there may be more than one covering). In some cases again there is flesh and a stone between the envelope and the seed, as in olive plum and other fruits. Some seeds again are enclosed in a pod, some in a husk, some in a vessel, and some are completely naked.

[5] Enclosed in a pod are not[6] only the seeds of annual plants, as leguminous plants, and of considerable numbers of wild plants, but also those of certain trees, as the carob-tree (which some[7] call the 'Egyptian fig'), Judas-tree,[8] and the *koloitia*[9] of the Liparae islands. In a husk are enclosed the

[7] ἥν τινες conj. St. from G; ἥντινα Ald.H.
[8] Clearly not the κερκίς (aspen) described 3. 14. 2.
[9] κολοιτία MSS.; κολουτέα conj. St., *cf.* 3. 17. 2 n.

ἐπετείων, ὥσπερ ὁ πυρὸς καὶ ὁ κέγχρος· ὡσαύτως δὲ καὶ ἐναγγειοσπέρματα καὶ γυμνοσπέρματα. ἐναγγειοσπέρματα μὲν οἷον ἥ τε μήκων καὶ ὅσα μηκωνικά· τὸ γὰρ σήσαμον ἰδιωτέρως· γυμνοσπέρματα δὲ τῶν τε λαχάνων πολλά, καθάπερ ἄνηθον κορίαννον ἄννησον κύμινον μάραθον καὶ
3 ἕτερα πλείω. τῶν δὲ δένδρων οὐδὲν γυμνόσπερμον ἀλλ' ἢ σαρξὶ περιεχόμενον ἢ κελύφεσιν, τὰ μὲν δερματικοῖς, ὥσπερ ἡ βάλανος καὶ τὸ Εὐβοϊκόν, τὰ δὲ ξυλώδεσιν, ὥσπερ ἡ ἀμυγδάλη καὶ τὸ κάρυον. οὐδὲν δὲ ἐναγγειόσπερμον, εἰ μή τις τὸν κῶνον ἀγγεῖον θήσει διὰ τὸ χωρίζεσθαι τῶν καρπῶν.

Αὐτὰ δὲ τὰ σπέρματα τῶν μὲν εὐθὺ σαρκώδη, καθάπερ ὅσα καρυηρὰ καὶ βαλανηρά· τῶν δὲ ἐν πυρῆνι τὸ σαρκῶδες ἔχεται, καθάπερ ἐλάας καὶ δαφνίδος καὶ ἄλλων. τῶν δ' ἐμπύρηνα μόνον ἢ πυρηνώδη γε καὶ ὥσπερ ξηρά, καθάπερ τὰ κνηκώδη καὶ κεγχραμιδώδη καὶ πολλὰ τῶν λαχανηρῶν. ἐμφανέστατα δὲ τὰ τοῦ φοίνικος· οὐδὲ γὰρ κοιλότητα ἔχει τοῦτο οὐδεμίαν ἀλλ' ὅλον ξηρόν· οὐ μὴν ἀλλ' ὑγρότης δή τις καὶ θερμότης ὑπάρχει δῆλον ὅτι καὶ τούτῳ, καθάπερ εἴπομεν.

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[1] *μηκωνικὰ . . . τὸ γὰρ* conj. W. from G; *μήκωνι· κατὰ γὰρ* UMVAld.

[2] *κορίαννον ἄννησον* conj. Sch.; *κοριάννησον* UMAld.; *κοράννησον* V; *cf.* Plin. 19. 119.

[3] *ἢ κελύφεσιν* conj. Sch., *cf. C.P.* 4. 1. 2; *ἢ δὲ κύμασιν* U; Plin. 15. 112, *crusta teguntur glandes.* [4] Plin. 15. 113.

seeds of some annuals, as wheat and millet; and in like manner some plants have their seeds in a vessel, some have them naked. In a vessel are those of the poppy and plants of the poppy kind;[1] (the case of sesame however is somewhat peculiar), while many pot-herbs have their seeds naked, as dill coriander[2] anise cummin fennel and many others. No tree has naked seeds, but either they are enclosed in flesh or in shells,[3] which are sometimes of leathery nature, as the acorn and the sweet chestnut, sometimes woody, as almond and nut. Moreover no tree has its seeds in a vessel, unless one reckons a cone as a vessel, because it can be separated from the fruits.

The actual seeds are in some cases fleshy in themselves, as all those which resemble nuts or acorns;[4] in some cases the fleshy part is contained in a stone, as in olive bay and others. The seeds in some plants again merely consist of a stone,[5] or at least are of stone-like character, and are, as it were,[6] dry; for instance those of plants like safflower millet and many pot-herbs. Most obviously of this character are those of the date,[7] for they contain no cavity, but are throughout dry[8];—not but what there must be even in them some moisture and warmth, as we have said.[9]

[5] *ἐμπύρηνα μόνον ἢ πυρηνώδη* conj. Sch.; *ἐν πυρῆνι μόνον ἢ πυρηνώδει* Ald. (P has *πυρηνώδη*).

[6] *i.e.* no seed can really be without moisture; *cf.* 1. 11. 1.

[7] *cf. C.P.* 5. 18. 4.

[8] *ξηρὸν* I conj., as required by the next clause; *ἔξορθον* PAld.; *ἔξορρον* W. from Sch. conj. The germ in the date-stone is so small as to be undiscoverable, whence the stone seems to be homogeneous throughout, with no cavity for the germ.

[9] 1. 10. 9.

4 Διαφέρουσι δὲ καὶ τῷ τὰ μὲν ἀθρόα μετ' ἀλλήλων εἶναι, τὰ δὲ διεστῶτα καὶ στοιχηδόν, ὥσπερ τὰ τῆς κολοκύντης καὶ σικύας καὶ τῶν δένδρων, ὡς Περσικῆς μηλέας. καὶ τῶν ἀθρόων τὰ μὲν ἑνί τινι περιέχεσθαι, καθάπερ τὰ τῆς ῥόας καὶ τῆς ἀπίου καὶ μηλέας καὶ τῆς ἀμπέλου καὶ συκῆς· τὰ δὲ μετ' ἀλλήλων μὲν εἶναι, μὴ περιέχεσθαι δὲ ὑφ' ἑνός, ὥσπερ τὰ σταχυηρὰ τῶν ἐπετείων, εἰ μή τις θείη τὸν στάχυν ὡς περιέχον· οὕτω δ' ἔσται καὶ ὁ βότρυς καὶ τἆλλα τὰ βοτρυώδη καὶ ὅσα δὴ φέρει δι' εὐβοσίαν καὶ χώρας ἀρετὴν ἀθρόους τοὺς καρπούς, ὥσπερ ἐν Συρίᾳ φασὶ καὶ ἄλλοθι τὰς ἐλάας.

5 Ἀλλὰ καὶ αὕτη δοκεῖ τις εἶναι διαφορὰ τὸ τὰ μὲν ἀφ' ἑνὸς μίσχου καὶ μιᾶς προσφύσεως ἀθρόα γίνεσθαι, καθάπερ ἐπί τε τῶν βοτρυηρῶν καὶ σταχυηρῶν εἴρηται μὴ περιεχόμενα κοινῷ τινι γίνεσθαι· τὰ δὲ μὴ γίνεσθαι. ἐπεὶ καθ' ἕκαστόν γε λαμβάνοντι τῶν σπερμάτων ἢ τῶν περιεχόντων ἰδίαν ἀρχὴν ἔχει τῆς προσφύσεως, οἷον ἥ τε ῥὰξ καὶ ἡ ῥόα καὶ πάλιν ὁ πυρὸς καὶ ἡ κριθή. ἥκιστα δ' ἂν δόξειεν τὰ τῶν μήλων καὶ τὰ τῶν ἀπίων, ὅτι συμψαύει τε καὶ περιείληπται καθάπερ ὑμένι τινὶ δερματικῷ περὶ ὃν τὸ περι-
6 κάρπιον· ἀλλ' ὅμως καὶ τούτων ἕκαστον ἰδίαν ἀρχὴν ἔχει καὶ φύσιν· φανερώτατα δὲ τῷ

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[1] στοιχηδόν conj. W.; σχεδὸν Ald.
[2] ἑνί τινι conj. Sch.; ἐν τινι Ald.
[3] *cf.* Plin. 15. 15.
[4] αὕτη conj. Sch.; αὐτὴ Ald.
[5] τὸ conj. W.; τῷ Ald.

Further seeds differ in that in some cases they are massed together, in others they are separated and arranged in rows,[1] as those of the gourd and bottle-gourd, and of some trees, such as the citron. Again of those that are massed together some differ in being contained in a single[2] case, as those of pomegranate pear apple vine and fig; others in being closely associated together, yet not contained in a single case, as, among annuals, those which are in an ear—unless one regards the ear as a case. In that case the grape-cluster and other clustering fruits will come under the description, as well as all those plants which on account of good feeding or excellence of soil bear their fruits massed together,[3] as they say the olive does in Syria and elsewhere.

But this[4] too seems to be a point of difference, that[5] some grow massed together from a single stalk and a single attachment, as has been said in the case of plants with clusters or ears whose seeds do not grow contained in one common case; while others grow otherwise. For in these instances, if one takes each seed or case separately, it has its own special point of attachment, for instance each grape or pomegranate,[6] or again each grain of wheat or barley. This would seem to be least of all the case with the seeds of apples and pears, since[7] these touch one another[8] and are enclosed in a sort of skin-like membrane, outside which is the fruit-case.[9] However each of these too has its own peculiar point of attachment and character; this is most

[6] ἥ τε . . . ῥόα. : text perhaps defective; ἥ τε ῥὰξ βότρυας καὶ τῆς ῥόας ὁ πυρήν conj. Bod.

[7] ὅτι conj. Sch.; ὅπι U; ὅποι PMAld.

[8] *cf.* 8. 5. 2. [9] *i.e.* pulp.

κεχωρίσθαι τὰ τῆς ῥόας· ὁ γὰρ πυρὴν ἑκάστῳ προσπέφυκεν, οὐχ ὥσπερ τῶν συκῶν ἄδηλα διὰ τὴν ὑγρότητα. καὶ γὰρ τούτῳ ἔχουσι διαφορὰν καίπερ ἀμφότερα περιεχόμενα σαρκώδει τινὶ καὶ τῷ τοῦτο περιειληφότι μετὰ τῶν ἄλλων· τὰ μὲν γὰρ περὶ ἕκαστον ἔχει πυρῆνα τὸ σαρκῶδες τοῦτο τὸ ὑγρόν, αἱ δὲ κεγχραμίδες ὥσπερ κοινόν τι πᾶσαι, καθάπερ καὶ τὸ γίγαρτον καὶ ὅσα τὸν αὐτὸν ἔχει τρόπον. ἀλλὰ τὰς μὲν τοιαύτας διαφορὰς τάχ' ἄν τις λάβοι πλείους· ὧν δεῖ τὰς κυριωτάτας καὶ μάλιστα τῆς φύσεως μὴ ἀγνοεῖν.

XII. Αἱ δὲ κατὰ τοὺς χυλοὺς καὶ τὰ σχήματα καὶ τὰς ὅλας μορφὰς σχεδὸν φανεραὶ πᾶσιν, ὥστε μὴ δεῖσθαι λόγου· πλὴν τοσοῦτόν γ' ὅτι σχῆμα οὐδὲν περικάρπιον εὐθύγραμμον οὐδὲ γωνίας ἔχει. τῶν δὲ χυλῶν οἱ μέν εἰσιν οἰνώδεις, ὥσπερ ἀμπέλου συκαμίνου μύρτου· οἱ δ' ἐλαώδεις, ὥσπερ ἐλάας δάφνης καρύας ἀμυγδαλῆς πεύκης πίτυος ἐλάτης· οἱ δὲ μελιτώδεις, οἷον σύκου φοίνικος διοσβαλάνου· οἱ δὲ δριμεῖς, οἷον ὀριγάνου θύμβρας καρδάμου νάπυος· οἱ δὲ πικροί, ὥσπερ ἀψινθίου κενταυρίου. διαφέρουσι δὲ καὶ ταῖς εὐωδίαις, οἷον ἀννήσου κεδρίδος· ἐνίων δὲ ὑδαρεῖς ἂν δόξαιεν, οἷον οἱ τῶν κοκκυμηλέων· οἱ δὲ ὀξεῖς, ὥσπερ ῥοῶν

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[1] *i.e.* of the pulp. [2] *τούτῳ* conj. Sch.; *τοῦτο* Ald.
[3] *τὸν* om. St.: *i.e.* the seeds are arranged in compartments of the pulp.

obvious in the separation of the pomegranate seeds, for the stone is attached to each, and the connexion is not, as in figs, obscured by the moisture.[1] For here[2] too there is a difference, although in both cases the seeds are enclosed in a sort of fleshy substance, as well as in the case which encloses this and the other parts of the fruit. For in the pomegranate the stones have this moist fleshy substance enclosing each[3] separate stone; but in the case of fig-seeds, as well as in that of grape-stones and other plants which have the same arrangement, the same pulp is common to all.[4] However one might find more such differences, and one should not ignore the most important of them, namely those which specially belong to the plant's natural character.

Differences in taste.

XII. The differences in taste, shape, and form as a whole are tolerably evident to all, so that they do not need explanation; except that it should be stated that[5] the case containing the fruit is never right-lined in shape and never has angles.[6] Of tastes some are like wine, as those of vine mulberry and myrtle; some are like olive-oil, as, besides olive itself, bay hazel almond fir Aleppo pine silver-fir; some like honey, as fig date chestnut; some are pungent, as marjoram savory cress mustard; some are bitter, as wormwood centaury. Some also are remarkably fragrant, as anise and juniper[7]; of some the smell would seem to be insipid,[8] as in plums; of others sharp, as in pomegranates and

[4] *i.e.* the fruit is not divided into compartments.
[5] πλὴν ἢ τοσοῦτον conj. W.; πλὴν τοσοῦτον ἢ UMAld.
[6] Plin. 19. 186; 15. 109. [7] *cf.* 1. 9. 4. [8] Lit. watery.

καὶ ἐνίων μήλων. ἁπάντων δὲ οἰνώδεις καὶ τοὺς ἐν τούτῳ τῷ γένει θετέον· ἄλλοι δὲ ἐν ἄλλοις εἴδεσιν· ὑπὲρ ὧν ἁπάντων ἀκριβέστερον ἐν τοῖς περὶ χυλῶν ῥητέον, αὐτάς τε τὰς ἰδέας διαριθμουμένους ὁπόσαι καὶ τὰς πρὸς ἀλλήλους διαφορὰς καὶ τίς ἡ ἑκάστου φύσις καὶ δύναμις.

2 Ἔχει δὲ καὶ ἡ τῶν δένδρων αὐτῶν ὑγρότης, ὥσπερ ἐλέχθη, διάφορα εἴδη· ἡ μὲν γάρ ἐστιν ὀπώδης, ὥσπερ ἡ τῆς συκῆς καὶ τῆς μήκωνος· ἡ δὲ πιττώδης, οἷον ἐλάτης πεύκης τῶν κωνοφόρων· ἄλλη δ' ὑδαρής, οἷον ἀμπέλου ἀπίου μηλέας, καὶ τῶν λαχανωδῶν δέ, οἷον σικύου κολοκύντης θριδακίνης· αἱ δὲ [ἤδη] δριμύτητά τινα ἔχουσι, καθάπερ ἡ τοῦ θύμου καὶ θύμβρας· αἱ δὲ καὶ εὐωδίαν, ὥσπερ αἱ τοῦ σελίνου ἀνήθου μαράθου καὶ τῶν τοιούτων. ὡς δ' ἁπλῶς εἰπεῖν ἅπασαι κατὰ τὴν ἰδίαν φύσιν ἑκάστου δένδρου καὶ ὡς καθ' ὅλου εἰπεῖν φυτοῦ· πᾶν γὰρ ἔχει κρᾶσίν τινα καὶ μίξιν ἰδίαν, ἥπερ οἰκεία δῆλον ὅτι τυγχάνει τοῖς ὑποκειμένοις καρποῖς· ὧν τοῖς πλείστοις συνεμφαίνεταί τις ὁμοιότης οὐκ ἀκριβὴς οὐδὲ σαφής· ἀλλ' ἐν τοῖς περικαρπίοις· διὸ μᾶλλον κατεργασίαν λαμβάνει καὶ πέψιν καθαρὰν καὶ εἰλικρινῆ ἡ τοῦ

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[1] *cf. C.P.* 6. 6. 4.

[2] T. is said to have written a treatise *περὶ χυμῶν*.

[3] *ὀπώδης*. *ὀπός* is used specially of the juice of the fig itself.

[4] *μήκωνος* probably corrupt: it should be a tree.

some kinds of apples. [1] But the smells even of those in this class must in all cases be called wine-like, though they differ in different kinds, on which matter we must speak more precisely, when we come to speak of flavours,[2] reckoning up the different kinds themselves, and stating what differences there are between them, and what is the natural character and property of each.

Now the sap of the trees themselves assumes different kinds of tastes as was said; sometimes it is milky,[3] as that of the fig and poppy,[4] sometimes like pitch, as in silver-fir fir and the conifers; sometimes it is insipid, as in vine pear and apple, as well as such pot-herbs as cucumber gourd lettuce; while others[5] again have a certain pungency, such as the juice of thyme and savory; others have a fragrance, such as the juices of celery dill fennel and the like. To speak generally, all saps correspond to the special character of the several trees, one might almost add, to that of each plant. For every plant has a certain temperament and composition of its own, which[6] plainly belongs in a special sense to the fruits of each. And in most of these is seen a sort of correspondence with the character of the plant as a whole, which is not however exact nor obvious; it is chiefly[7] in the fruit-cases[8] that it is seen, and that is why it is the character of the flavour which becomes more complete and matures into something separate and

[5] I have bracketed ἤδη: ? a dittography of αἱ δὲ.

[6] ἥπερ mBas. H; εἴπερ MAld.

[7] ἀλλ' ἐν . . . μᾶλλον MSS. (?) Ald. H; γὰρ for διὸ conj. W., omitting stop before it.

[8] *i.e.* the pulp: so G. *cf.* 1. 11. 6.

χυλοῦ φύσις· δεῖ γὰρ ὥσπερ τὸ μὲν ὕλην ὑπολαβεῖν τὸ δὲ εἶδος καὶ μορφήν.

3 Ἔχει δὲ αὐτὰ τὰ σπέρματα καὶ οἱ χιτῶνες οἱ περὶ αὐτὰ διαφορὰν τῶν χυλῶν. ὡς δ' ἁπλῶς εἰπεῖν ἅπαντα τὰ μόρια τῶν δένδρων καὶ φυτῶν, οἷον ῥίζα καυλὸς ἀκρεμὼν φύλλον καρπός, ἔχει τινὰ οἰκειότητα πρὸς τὴν ὅλην φύσιν, εἰ καὶ παραλλάττει κατά τε τὰς ὀσμὰς καὶ τοὺς χυλούς, ὡς τὰ μὲν εὔοσμα καὶ εὐώδη τὰ δ' ἄοσμα καὶ ἄχυλα παντελῶς εἶναι τῶν τοῦ αὐτοῦ μορίων.

4 Ἐνίων γὰρ εὔοσμα τὰ ἄνθη μᾶλλον ἢ τὰ φύλλα, τῶν δὲ ἀνάπαλιν τὰ φύλλα μᾶλλον καὶ οἱ κλῶνες, ὥσπερ τῶν στεφανωματικῶν· τῶν δὲ οἱ καρποί· τῶν δ' οὐδέτερον· ἐνίων δ' αἱ ῥίζαι· τῶν δέ τι μέρος. ὁμοίως δὲ καὶ κατὰ τοὺς χυλούς· τὰ μὲν γὰρ βρωτὰ τὰ δ' ἄβρωτα τυγχάνει καὶ ἐν φύλλοις καὶ περικαρπίοις. ἰδιώτατον δὲ τὸ ἐπὶ τῆς φιλύρας· ταύτης γὰρ τὰ μὲν φύλλα γλυκέα καὶ πολλὰ τῶν ζώων ἐσθίει, ὁ δὲ καρπὸς οὐδενὶ βρωτός· ἐπεὶ τό γε ἀνάπαλιν οὐδὲν θαυμαστόν, ὥστε τὰ μὲν φύλλα μὴ ἐσθίεσθαι τοὺς δὲ καρποὺς οὐ μόνον ὑφ' ἡμῶν ἀλλὰ καὶ ὑπὸ τῶν ἄλλων ζώων. ἀλλὰ καὶ περὶ τούτου καὶ τῶν ἄλλων τῶν τοιούτων ὕστερον πειρατέον θεωρεῖν τὰς αἰτίας.

XIII. Νῦν δὲ τοσοῦτον ἔστω δῆλον, ὅτι κατὰ πάντα τὰ μέρη πλείους εἰσὶ διαφοραὶ πολλαχῶς·

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[1] *i.e.* the pulp. [2] *i.e.* the flavour.

[3] Sense: Every tree has a characteristic juice of its own, which is however specially recognisable in its fruit; in the tree as a whole its character is not always apparent. Hence the importance of the flavour (which is seen in the fruit-pulp), since it is this which determines the specific character,

distinct; in fact we must consider the one[1] as 'matter,' the other[2] as 'form' or specific character.[3]

Again the seeds themselves and the coats containing them have different flavours. And, to speak generally, all parts of trees and plants, as root stem branch leaf fruit, have a certain relationship to the character of the whole, even if[4] there is variation in scents and tastes, so that of the parts of the same plant some are fragrant and sweet to the taste, while others are entirely scentless and tasteless.

For in some plants the flowers are more fragrant than the leaves, in others on the contrary it is rather the leaves and twigs which are fragrant, as in those used for garlands. In others again it is the fruits; in others it is neither[5] of these parts, but, in some few cases, the root or some part of it. And so too with the flavours. Some leaves and some fruit-pulps are, and some are not good for food. [6] Most peculiar is the case of the lime: the leaves of this are sweet, and many animals eat them, but the fruit no creature eats, (for, as to the contrary case, it would not be at all surprising that the leaves should not be eaten, while the fruits were eaten not only by us but by other animals). But concerning this and other such matters we must endeavour to consider the causes on some other occasion.

Differences in flowers.

XIII. For the present let so much be clear, that in all the parts of plants there are numerous differ-

the pulp of fruit in general being, in Aristotelian language, the 'matter,' while the flavour is 'form.' *cf. C.P.* 6. 6. 6.

[4] εἰ καὶ conj. Sch.; ἡ δὲ U; εἰ δὲ MVAld.

[5] οὐδέτερον seems inaccurately used, as four parts have been mentioned. [6] *cf.* 3 10. 5; Plin 16. 65.

ἐπεὶ καὶ τῶν ἀνθῶν τὰ μέν ἐστι χνοώδη, καθάπερ τὸ τῆς ἀμπέλου καὶ συκαμίνου καὶ τοῦ κιττοῦ· τὰ δὲ φυλλώδη, καθάπερ ἀμυγδαλῆς μηλέας ἀπίου κοκκυμηλέας. καὶ τὰ μὲν μέγεθος ἔχει, τὸ δὲ τῆς ἐλάας φυλλῶδες ὂν ἀμέγεθες. ὁμοίως δὲ καὶ ἐν τοῖς ἐπετείοις καὶ ποιώδεσι τὰ μὲν φυλλώδη τὰ δὲ χνοώδη. πάντων δὲ τὰ μὲν δίχροα τὰ δὲ μονόχροα. τὰ μὲν τῶν δένδρων τά γε πολλὰ μονόχροα καὶ λευκανθῆ· μόνον γὰρ ὡς εἰπεῖν τὸ τῆς ῥόας φοινικοῦν καὶ ἀμυγδαλῶν τινων ὑπέρυθρον· ἄλλου δὲ οὐδενὸς τῶν ἡμέρων οὔτε ἀνθῶδες οὔτε δίχρουν, ἀλλ' εἴ τινος τῶν ἀγρίων, οἷον τὸ τῆς ἐλάτης· κρόκινον γὰρ τὸ ταύτης ἄνθος· καὶ ὅσα δή φασιν ἐν τῇ ἔξω θαλάττῃ ῥόδων ἔχειν τὴν χρόαν.

2 Ἐν δὲ τοῖς ἐπετείοις σχεδὸν τά γε πλείω τοιαῦτα καὶ δίχροα καὶ διανθῆ. λέγω δὲ διανθὲς ὅτι ἕτερον ἄνθος ἐν τῷ ἄνθει ἔχει κατὰ μέσον, ὥσπερ τὸ ῥόδον καὶ τὸ κρίνον καὶ τὸ ἴον τὸ μέλαν. ἔνια δὲ καὶ μονόφυλλα φύεται διαγραφὴν ἔχοντα μόνον τῶν πλειόνων, ὥσπερ τὸ τῆς ἰασιώνης· οὐ γὰρ κεχώρισται ταύτης ἐν τῷ ἄνθει τὸ φύλλον ἕκαστον· οὐδὲ δὴ τοῦ λειρίου τὸ κάτω μέρος, ἀλλὰ ἐκ τῶν ἄκρων ἀποφύσεις γωνιώδεις. σχεδὸν δὲ καὶ τὸ τῆς ἐλάας τοιοῦτόν ἐστιν.

3 Διαφέρει δὲ καὶ κατὰ τὴν ἔκφυσιν καὶ θέσιν· τὰ μὲν γὰρ ἔχει περὶ αὐτὸν τὸν καρπόν, οἷον ἄμ-

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[1] *i.e.* petaloid.
[2] ἀγρίων Ald.; αἰτίων U; ἀντιῶν MV; ποντίων conj. W.
[3] *i.e.* corolla and stamens, etc.
[4] *i.e.* are gamopetalous (or gamosepalous).

ences shewn in a variety of ways. Thus of flowers some are downy, as that of the vine mulberry and ivy, some are 'leafy,'[1] as in almond apple pear plum. Again some of these flowers are conspicuous, while that of the olive, though it is 'leafy,' is inconspicuous. Again it is in annual and herbaceous plants alike that we find some leafy, some downy. All plants again have flowers either of two colours or of one; most of the flowers of trees are of one colour and white, that of the pomegranate being almost the only one which is red, while that of some almonds is reddish. The flower of no other cultivated trees is gay nor of two colours, though it may be so with some uncultivated[2] trees, as with the flower of silver-fir, for its flower is of saffron colour; and so with the flowers of those trees by the ocean which have, they say, the colour of roses.

However, among annuals, most are of this character—their flowers are two-coloured and twofold.[3] I mean by 'twofold' that the plant has another flower inside the flower, in the middle, as with rose lily violet. Some flowers again consist of a single 'leaf,'[4] having merely an indication of more, as that of bindweed.[5] For in the flower of this the separate 'leaves' are not distinct; nor is it so in the lower part of the narcissus,[6] but there are angular projections[7] from the edges. And the flower of the olive is nearly of the same character.

But there are also differences in the way of growth and the position of the flower; some plants have it

[5] *cf. C.P.* 2. 18. 2 and 3; Plin. 21. 65.

[6] λειρίου conj. Sch., *i.e.* narcissus, *cf.* 6. 6. 9; χειρίου MSS.

[7] *i.e.* something resembling separate 'leaves' (petals or sepals).

πελος ἐλάα· ἧς καὶ ἀποπίπτοντα διατετρημένα φαίνεται, καὶ τοῦτο σημεῖον λαμβάνουσιν εἰ καλῶς ἀπήνθηκεν· ἐὰν γὰρ συγκαυθῇ ἢ βρεχθῇ, συναποβάλλει τὸν καρπὸν καὶ οὐ τετρημένον γίγνεται· σχεδὸν δὲ καὶ τὰ πολλὰ τῶν <ἀνθῶν>[2] ἐν μέσῳ τὸ περικάρπιον ἔχει, τάχα δὲ καὶ ἐπ' αὐτοῦ τοῦ περικαρπίου, καθάπερ ῥόα μελέα ἄπιος κοκκυμηλεα μύρρινος, καὶ τῶν γε φρυγανικῶν ῥοδωνία καὶ τὰ πολλὰ τῶν στεφανωτικῶν· κάτω γὰρ ὑπὸ τὸ ἄνθος ἔχει τὰ σπέρματα· φανερώτατον δὲ ἐπὶ τοῦ ῥόδου διὰ τὸν ὄγκον. ἔνια δὲ καὶ ἐπ' αὐτῶν τῶν σπερμάτων, ὥσπερ ὁ ἄκανος καὶ ὁ κνῆκος καὶ πάντα τὰ ἀκανώδη· καθ' ἕκαστον γὰρ ἔχει τὸ ἄνθος. ὁμοίως δὲ καὶ τῶν ποιωδῶν ἔνια, καθάπερ τὸ ἄνθεμον· ἐν δὲ τοῖς λαχανηροῖς ὅ τε σίκυος καὶ ἡ κολοκύντη καὶ ἡ σικύα· πάντα γὰρ ἐπὶ τῶν καρπῶν ἔχει καὶ προσαυξανομένων ἐπιμένει τὰ ἄνθη πολὺν χρόνον.

4 Ἄλλα δὲ ἰδιωτέρως, οἷον ὁ κιττὸς καὶ ἡ συκάμινος· ἐν αὐτοῖς μὲν γὰρ ἔχει τοῖς ὅλοις περικαρπίοις, οὐ μὴν οὔτε ἐπ' ἄκροις οὔτ' ἐπὶ περιειληφόσι καθ' ἕκαστον, ἀλλ' ἐν τοῖς ἀνὰ μέσον· εἰ μὴ ἄρα οὐ σύνδηλα διὰ τὸ χνοῶδες.

Ἔστι δὲ καὶ ἄγονα τῶν ἀνθῶν ἔνια, καθάπερ ἐπὶ τῶν σικύων ἃ ἐκ τῶν ἄκρων φύεται τοῦ κλή-

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[1] *cf.* 3. 16. 4. [2] Lacuna in text ; ἀνθῶν I conj.
[3] τάχα Ald.; τινα W. after Sch. conj.
[4] ἄπιος conj. Bod.; ἄγνος Ald.H.
[5] *i.e.* composites.
[6] σπερμάτων conj. Dalec. from G ; στομάτων Ald.
[7] ἄκανος conj. W.; ἄκαρος UV.
[8] ἀκανώδη conj. W.; ἀνθώδη Ald.H. *cf.* 1. 10. 6 ; 6. 4. 4.

close above the fruit, as vine and olive; in the latter, when the flowers drop off, they are seen to have a hole through them,[1] and this men take for a sign whether the tree has blossomed well; for if the flower is burnt up or sodden, it sheds the fruit along with itself, and so there is no hole through it. The majority of flowers[2] have the fruit-case in the middle of them, or, it may be,[3] the flower is on the top of the fruit-case, as in pomegranate apple pear[4] plum and myrtle, and among under-shrubs, in the rose and in many of the coronary plants. For these have their seeds below, beneath the flower, and this is most obvious in the rose because of the size of the seed-vessel. In some cases[5] again the flower is on top of the actual seeds,[6] as in pine-thistle[7] safflower and all thistle-like[8] plants; for these have a flower attached to each seed. So too with some herbaceous plants, as *anthemon*, and among pot-herbs, with cucumber[9] gourd and bottle-gourd; all these have their flowers attached on top of the fruits,[10] and the flowers persist for a long time while the fruits are developing.

In some other plants the attachment is peculiar, as in ivy and mulberry; in these the flower is closely attached to the whole[11] fruit-case; it is not however set above it, nor in a seed-vessel that envelops each[12] separately, but it occurs in the middle part of the structure—except that in some cases it is not easily recognised because it is downy.

[13] Again some flowers are sterile, as in cucumbers those which grow at the ends of the shoot, and that

[9] *ὅ τε σίκυος* conj. W.; *ὅπερ σίκυος* UM; *ὁ περσίκυος* Ald.
[10] *καρπῶν* conj. Sch.; *ἄκρων* Ald.H.
[11] *i.e.* compound. [12] *οὔτ' ἐπὶ* I conj. for *οὐτὲ*.
[13] *cf.* Arist. *Probl.* 20. 3.

ματος, δι' ὃ καὶ ἀφαιροῦσιν αὐτά· κωλύει γὰρ τὴν τοῦ σικύου βλάστησιν. φασὶ δὲ καὶ τῆς μηλέας τῆς Μηδικῆς ὅσα μὲν ἔχει τῶν ἀνθῶν ὥσπερ ἠλακάτην τινὰ πεφυκυῖαν ἐκ μέσου ταῦτ' εἶναι γόνιμα, ὅσα δὲ μὴ ἔχει ταῦτ' ἄγονα. εἰ δὲ καὶ ἐπ' ἄλλου τινὸς ταῦτα συμβαίνει τῶν ἀνθοφόρων ὥστε ἄγονον ἄνθος φύειν εἴτε κεχωρισμένον εἴτε μή, σκεπτέον. ἐπεὶ γένη γε ἔνια καὶ ἀμπέλου καὶ ῥόας ἀδυνατεῖ τελεοκαρπεῖν, ἀλλὰ μέχρι τοῦ ἄνθους ἡ γένεσις.

(Γίνεται δὲ καὶ τό γε τῆς ῥόας ἄνθος πολὺ καὶ πυκνὸν καὶ ὅλως ὁ ὄγκος πλατὺς ὥσπερ ὁ τῶν ῥόδων· κάτωθεν δ' ἑτεροῖος· οἷος δίωτος μικρὸς ὥσπερ ἐκτετραμμένος ὁ κύτινος ἔχων τὰ χείλη μυχώδη.)

Φασὶ δέ τινες καὶ τῶν ὁμογενῶν τὰ μὲν ἀνθεῖν τὰ δ' οὔ, καθάπερ τῶν φοινίκων τὸν μὲν ἄρρενα ἀνθεῖν τὸν δὲ θῆλυν οὐκ ἀνθεῖν ἀλλ' εὐθὺ προφαίνειν τὸν καρπόν.

Τὰ μὲν οὖν τῷ γένει ταὐτὰ τοιαύτην τὴν δια-

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[1] *i.e.* the pistil.

[2] *i.e.* as seen from above: καὶ ὅλων . . . ῥόδων describes the corolla, κάτωθεν . . . μυχώδη the undeveloped ovary, including the adherent calyx.

[3] ῥόδων conj. Bod.; ῥοῶν Ald.

[4] κάτωθεν . . . μυχώδη I conj.; δ' ἕτεροι δι' ὧν ὡς μικρὸν ὥσπερ ἐκτετραμμένος κότινος ἔχων τὰ χείλη μυχώδη UMVAld. (except that Ald. has ἄνω for χείλη and ἐκτετραμμένον: so also P, but ἐκτετραμμένος). The sentence explains incidentally why the pomegranate flower was called κύτινος (*cf.* 2. 6. 12; *C.P.* 1. 14. 4; 2. 9. 3; 2. 9. 9; Diosc. 1. 110; Plin. 23. 110

is why men pluck them off, for they hinder the growth of the cucumber. And they say that in the citron those flowers which have a kind of distaff[1] growing in the middle are fruitful, but those that have it not are sterile. And we must consider whether it occurs also in any other flowering plants that they produce sterile flowers, whether apart from the fertile flowers or not. For some kinds of vine and pomegranate certainly are unable to mature their fruit, and do not produce anything beyond the flower.

(The flower of the pomegranate is produced abundantly and is solid[2]: in general appearance it is a substantial structure with a flat top, like the flower of the rose[3]; but,[4] as seen from below, the inferior part of the flower is different-looking, being like a little two-eared jar turned on one side and having its rim indented.)

Some say that even of plants of the same kind[5] some specimens flower while others do not; for instance that the 'male' date-palm flowers but the 'female' does not, but exhibits its fruit without any antecedent flower.

Such[6] is the difference which we find between

and 111), *i.e.* because it resembled a *κύτος* (see LS. *s.v.*). T. chooses the particular form of jar called *δίωτος*, because the indentations between the sepals suggest this:  . This is called *ἐκτετραμμένος*, because the weight of the developing fruit causes it to take up at one stage a horizontal position, like a jar lying on its side; *χείλη* refers to the jar (for the plural *cf.* the use of *ἄντυγες*), *μυχώδη* to the indentations in the calyx (a jar having ordinarily an unindented rim).

[5] *δμογενῶν* conj. Sch.; *ὁμοιογενῶν* Ald.

[6] *ταὐτὰ τοιαύτην* I conj. from G; *τοιαῦτα τὴν* UM: *τοιαύτην* P.

φορὰν ἔχει, καθάπερ ὅλως ὅσα μὴ δύναται τελεοκαρπεῖν. ἡ δὲ τοῦ ἄνθους φύσις ὅτι πλείους ἔχει διαφορὰς φανερὸν ἐκ τῶν προειρημένων.

XIV. Διαφέρει δὲ τὰ δένδρα καὶ τοῖς τοιούτοις κατὰ τὴν καρποτοκίαν· τὰ μὲν γὰρ ἐκ τῶν νέων βλαστῶν φέρει τὰ δ' ἐκ τῶν ἔνων τὰ δ' ἐξ ἀμφοτέρων. ἐκ μὲν τῶν νέων συκῆ ἄμπελος· ἐκ δὲ τῶν ἔνων ἐλάα ῥόα μηλέα ἀμυγδαλῆ ἄπιος μύρρινος καὶ σχεδὸν τὰ τοιαῦτα πάντα· ἐκ δὲ τῶν νέων ἐὰν ἄρα τι συμβῇ κυῆσαι καὶ ἀνθῆσαι (γίνεται γὰρ καὶ ταῦτ' ἐνίοις, ὥσπερ καὶ τῷ μυρρίνῳ καὶ μάλισθ' ὡς εἰπεῖν περὶ τὰς βλαστήσεις τὰς μετ' Ἀρκτοῦρον) οὐ δύναται τελεοῦν ἀλλ' ἡμιγενῆ φθείρεται· ἐξ ἀμφοτέρων δὲ καὶ τῶν ἔνων καὶ τῶν νέων εἴ τινες ἄρα μηλέαι τῶν διφόρων ἢ εἴ τι ἄλλο κάρπιμον· ἔτι δὲ ὁ ὄλυνθος ἐκπέττων καὶ σῦκα φέρων ἐκ τῶν νέων.

2 Ἰδιωτάτη δὲ ἡ ἐκ τοῦ στελέχους ἔκφυσις, ὥσπερ τῆς ἐν Αἰγύπτῳ συκαμίνου· ταύτην γάρ φασι φέρειν ἐκ τοῦ στελέχους· οἱ δὲ ταύτῃ τε καὶ ἐκ τῶν ἀκρεμόνων, ὥσπερ τὴν κερωνίαν· αὕτη γὰρ καὶ ἐκ τούτων φέρει πλὴν οὐ πολύν· καλοῦσι δὲ κερωνίαν ἀφ' ἧς τὰ σῦκα τὰ Αἰγύπτια καλούμενα.

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[1] ? *i.e.* that, like the 'female' date-palm, they have no flower.

[2] τοιαῦτα πάντα· ἐκ δὲ τῶν νέων ἐὰν ἄρα τι conj. W. ; τοιαῦτα· πάντα γὰρ ἐκ τῶν ἔνων· ἐὰν δὲ ἄρα τι MSS.

[3] *cf.* 3. 5. 4.

[4] διφόρων conj. Sch. from G ; διαφόρων UAld.

plants of the same kind; and the like may be said[1] in general of those which cannot mature their fruit. And it is plain from what has been said that flowers shew many differences of character.

Differences in fruits.

XIV. Again as to the production of fruit trees differ in the following respects. Some bear on their new shoots, some on last year's wood, some on both. Fig and vine bear on their new shoots; on last year's wood olive pomegranate apple almond pear myrtle and almost all such trees. And, if any of these does[2] happen to conceive and to produce flowers on its new shoots, (for this does occur in some cases, as with myrtle, and especially, one may say, in the growth which is made after the rising of Arcturus)[3] it can not bring them to perfection, but they perish half-formed. Some apples again of the twice-bearing[4] kinds and certain other fruit-trees bear both on last year's wood and on the new shoots; and so does the *olynthos*,[5] which ripens its fruit as well as bearing figs on the new shoots.

Most peculiar is the growth of fruit direct from the stem, as in the sycamore; for this, they say, bears fruit on the stem. Others say that it bears both in this way and[6] also on the branches, like the carob; for the latter bears on the branches too, though not abundantly: (the name carob is given to the tree which produces what are called 'Egyptian

[5] ὄλυνθος is not elsewhere used for a kind of fig: ἔτι δὲ συκῆ τοὺς ὀλύνθους ἐκπέττουσα καὶ σῦκα φέρουσα conj. Sch. somewhat drastically.

[6] ταύτῃ τε καὶ ἐκ conj. W.; ταύτης μὲν ἐκ UMVAld. *cf.* 4. 2. 4.

ἔστι δὲ καὶ τὰ μὲν ἀκρόκαρπα τῶν δένδρων καὶ ὅλως τῶν φυτῶν τὰ δὲ πλαγιόκαρπα τὰ δ' ἀμφοτέρως. πλείω δ' ἀκρόκαρπα τῶν ἄλλων ἢ τῶν δένδρων, οἷον τῶν τε σιτηρῶν τὰ σταχυώδη καὶ τῶν θαμνωδῶν ἐρείκη καὶ σπειραία καὶ ἄγνος καὶ ἄλλ' ἄττα καὶ τῶν λαχανωδῶν τὰ κεφαλόρριζα. ἐξ ἀμφοτέρων δὲ καὶ τῶν δένδρων ἔνια καὶ τῶν λαχανωδῶν, οἷον βλίτον ἀδράφαξυς ῥάφανος· ἐπεὶ καὶ ἐλάα ποιεῖ πως τοῦτο, καί φασιν ὅταν ἄκρον ἐνέγκῃ σημεῖον εὐφορίας εἶναι. ἀκρόκαρπος δέ πως καὶ ὁ φοῖνιξ· πλὴν τοῦτό γε καὶ ἀκρόφυλλον καὶ ἀκρόβλαστον· ὅλως γὰρ ἐν τῷ ἄνω πᾶν τὸ ζωτικόν. τὰς μὲν οὖν κατὰ <τὰ> μέρη διαφορὰς πειρατέον ἐκ τούτων θεωρεῖν.

3 Αἱ δὲ τοιαῦται τῆς ὅλης οὐσίας φαίνονται· δῆλον ὅτι τὰ μὲν ἥμερα τὰ δ' ἄγρια· καὶ τὰ μὲν κάρπιμα τὰ δ' ἄκαρπα· καὶ ἀείφυλλα καὶ φυλλοβόλα, καθάπερ ἐλέχθη, τὰ δ' ὅλως ἄφυλλα· καὶ τὰ μὲν ἀνθητικὰ τὰ δ' ἀνανθῆ· καὶ πρωΐβλαστῆ δὲ καὶ πρωΐκαρπα τὰ δὲ ὀψιβλαστῆ καὶ ὀψίκαρπα· ὡσαύτως δὲ καὶ ὅσα παραπλήσια τούτοις. καί πως τά γε τοιαῦτα ἐν τοῖς μέρεσιν ἢ οὐκ ἄνευ τῶν μερῶν ἐστιν. ἀλλ' ἐκείνη ἰδιωτάτη καὶ τροπόν τινα μεγίστη διάστασις, ἥπερ καὶ ἐπὶ τῶν ζώων, ὅτι τὰ μὲν ἔννυδρα τὰ δὲ χερσαῖα· καὶ γὰρ τῶν φυτῶν

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[1] Plin. 16. 112.
[2] τοῦτο conj. Sch.; τούτου UAld.; τοῦτον M.
[3] τὰ add. W.; *cf.* 1. 13. 1.

figs'). [1] Again some trees, and some plants in general, produce fruit at the top, others at the sides, others in both ways. But bearing fruit at the top is less common in trees than in other plants, as among grains in those which have an ear, among shrubby plants in heath privet chaste tree and certain others, and among pot-herbs in those with a bulbous root. Among plants which bear both on the top and at the sides are certain trees and certain pot-herbs, as blite orach cabbage. I say trees, since the olive does this too in a way, and they say that, when it bears at the top, it is a sign of fruitfulness. The date-palm too bears at the top, in a sense, but this [2] tree also has its leaves and shoots at the top; indeed it is in the top that its whole activity is seen. Thus we must endeavour to study in the light of the instances mentioned the differences seen in the [3] various parts of the plant.

General differences (affecting the whole plant).

But there appear to be the following differences which affect the plant's whole being: some are cultivated, some wild; some fruitful, some barren; some evergreen, some deciduous, as was said, while some again have no leaves at all; some are flowering plants, some flowerless; some are early, some late in producing their shoots and fruits; and there are other differences similar to these. Now it may be said that [4] such differences are seen in the parts, or at least that particular parts are concerned in them. But the special, and in a way the most important distinction is one which may be seen in animals too, namely, that some are of the water, some of the land. For

[4] καί πως τά γε τοιαῦτα conj. Sch.; καὶ πῶν τά γε ταῦτα U; καὶ τά γε τοιαῦτα Ald.

ἔστι τι τοιοῦτον γένος ὃ οὐ δύναται φύεσθαι <μὴ> ἐν ὑγρῷ· τὰ δὲ φύεται μέν, οὐχ ὅμοια δὲ ἀλλὰ χείρω. πάντων δὲ τῶν δένδρων ὡς ἁπλῶς εἰπεῖν καὶ τῶν φυτῶν εἴδη πλείω τυγχάνει καθ' ἕκαστον
4 γένος· σχεδὸν γὰρ οὐδέν ἐστιν ἁπλοῦν· ἀλλ' ὅσα μὲν ἥμερα καὶ ἄγρια λέγεται ταύτην ἐμφανεστάτην καὶ μεγίστην ἔχει διαφοράν, οἷον συκῆ ἐρινεός, ἐλάα κότινος, ἄπιος ἀχράς· ὅσα δ' ἐν ἑκατέρῳ τούτων τοῖς καρποῖς τε καὶ φύλλοις καὶ ταῖς ἄλλαις μορφαῖς τε καὶ τοῖς μορίοις. ἀλλὰ τῶν μὲν ἀγρίων ἀνώνυμα τὰ πλεῖστα καὶ ἔμπειροι ὀλίγοι· τῶν δὲ ἡμέρων καὶ ὠνομασμένα τὰ πλείω καὶ ἡ αἴσθησις κοινοτέρα· λέγω δ' οἷον ἀμπέλου συκῆς ῥόας μηλέας ἀπίου δάφνης μυρρίνης τῶν ἄλλων· ἡ γὰρ χρῆσις οὖσα κοινὴ συνθεωρεῖν ποιεῖ τὰς διαφοράς.

5 Ἴδιον δὲ καὶ τοῦτ' ἐφ' ἑκατέρων· τὰ μὲν γὰρ ἄγρια τῷ ἄρρενι καὶ τῷ θήλει ἢ μόνοις ἢ μάλιστα διαιροῦσι, τὰ δὲ ἥμερα πλείοσιν ἰδέαις. ἔστι δὲ τῶν μὲν ῥᾷον λαβεῖν καὶ διαριθμῆσαι τὰ εἴδη, τῶν δὲ χαλεπώτερον διὰ τὴν πολυχοΐαν.

Ἀλλὰ δὴ τὰς μὲν τῶν μορίων διαφορὰς καὶ τῶν ἄλλων οὐσιῶν ἐκ τούτων πειρατέον θεωρεῖν. περὶ δὲ τῶν γενέσεων μετὰ ταῦτα λεκτέον· τοῦτο γὰρ ὥσπερ ἐφεξῆς τοῖς εἰρημένοις ἐστίν.

of plants too there is a class which cannot grow except[1] in moisture, while others will indeed grow on dry land, but they lose their character and are inferior. Again of all trees, one might almost say, and of all plants there are several forms to each kind; for hardly any kind contains but a single form. But the plants which are called respectively cultivated and wild shew this difference in the clearest and most emphatic way, for instance the cultivated and wild forms of fig olive and pear. In each of these pairs there are differences in fruit and leaves, and in their forms and parts generally. But most of the wild kinds have no names and few know about them, while most of the cultivated kinds have received names[2] and they are more commonly observed; I mean such plants as vine fig pomegranate apple pear bay myrtle and so forth; for, as many people make use of them, they are led also to study the differences.

But there is this peculiarity as to the two classes respectively; in the wild kinds men find only or chiefly the distinction of 'male' and 'female,' while in the cultivated sorts they recognise a number of distinguishing features. In the former case it is easy to mark and count up the different forms, in the latter it is harder because the points of difference are numerous.

However we have said enough for study of the differences between parts and between general characters. We must now speak of the methods of growth, for this subject comes naturally after what has been said.

[1] *μὴ* add. W.

[2] *ὠνομασμένα τὰ πλείω* conj. Sch.; *ὠνομασμένων πλείω* Ald.

BOOK II

B

I. Αἱ γενέσεις τῶν δένδρων καὶ ὅλως τῶν φυτῶν ἢ αὐτόμαται ἢ ἀπὸ σπέρματος ἢ ἀπὸ ῥίζης ἢ ἀπὸ παρασπάδος ἢ ἀπὸ ἀκρεμόνος ἢ ἀπὸ κλωνὸς ἢ ἀπ᾽ αὐτοῦ τοῦ στελέχους εἰσίν, ἢ ἔτι τοῦ ξύλου κατακοπέντος εἰς μικρά· καὶ γὰρ οὕτως ἔνια φύεται. τούτων δὲ ἡ μὲν αὐτόματος πρώτη τις, αἱ δὲ ἀπὸ σπέρματος καὶ ῥίζης φυσικώταται δόξαιεν ἄν· ὥσπερ γὰρ αὐτόμαται καὶ αὐταί· δι᾽ ὃ καὶ τοῖς ἀγρίοις ὑπάρχουσιν· αἱ δὲ ἄλλαι τέχνης ἢ δὴ προαιρέσεως.

2 Ἅπαντα δὲ βλαστάνει κατά τινα τῶν τρόπων τούτων, τὰ δὲ πολλὰ κατὰ πλείους· ἐλάα μὲν γὰρ πάντως φύεται πλὴν ἀπὸ τοῦ κλωνός· οὐ γὰρ δύναται καταπηγνυμένη, καθάπερ ἡ συκῆ τῆς κράδης καὶ ἡ ῥόα τῆς ῥάβδου. καίτοι φασί γέ τινες ἤδη καὶ χάρακος παγείσης καὶ πρὸς τὸν κιττὸν συμβιῶσαι καὶ γενέσθαι δένδρον· ἀλλὰ σπάνιόν τι τὸ τοιοῦτον· θάτερα δὲ τὰ πολλὰ τῆς φύσεως. συκῆ δὲ τοὺς μὲν ἄλλους τρόπους

[1] ἔνια φύεται conj. Sch.; ἀναφύεται Ald.

BOOK II

Of Propagation, especially of Trees.

Of the ways in which trees and plants originate. Instances of degeneration from seed.

I. The ways in which trees and plants in general originate are these:—spontaneous growth, growth from seed, from a root, from a piece torn off, from a branch or twig, from the trunk itself; or again from small pieces into which the wood is cut up (for some trees can be produced [1] even in this manner). Of these methods spontaneous growth comes first, one may say, but growth from seed or root would seem most natural; indeed these methods too may be called spontaneous; wherefore they are found even in wild kinds, while the remaining methods depend on human skill or at least on human choice.

However all plants start in one or other of these ways, and most of them in more than one. Thus the olive is grown in all the ways mentioned, except from a twig; for an olive-twig will not grow if it is set in the ground, as a fig or pomegranate will grow from their young shoots. Not but what some say that cases have been known in which, when a stake of olive-wood was planted to support ivy, it actually lived along with it and became a tree; but such an instance is a rare exception, while the other methods of growth are in most cases the natural ones. The fig grows in all the ways mentioned,

φύεται πάντας, ἀπὸ δὲ τῶν πρέμνων καὶ τῶν ξύλων οὐ φύεται· μηλέα δὲ καὶ ἄπιος καὶ ἀπὸ τῶν ἀκρεμόνων σπανίως. οὐ μὴν ἀλλὰ τά γε πολλὰ ἢ πάνθ' ὡς εἰπεῖν ἐνδέχεσθαι δοκεῖ καὶ ἀπὸ τούτων, ἐὰν λεῖοι καὶ νέοι καὶ εὐαυξεῖς ὦσιν. ἀλλὰ φυσικώτεραί πως ἐκεῖναι· τὸ δὲ ἐνδεχόμενον ὡς δυνατὸν ληπτέον.

3 Ὅλως γὰρ ὀλίγα τὰ ἀπὸ τῶν ἄνω μᾶλλον βλαστάνοντα καὶ γεννώμενα, καθάπερ ἄμπελος ἀπὸ τῶν κλημάτων· αὕτη γὰρ οὐκ ἀπὸ τῆς πρώρας ἀλλ' ἀπὸ τοῦ κλήματος φύεται, καὶ εἰ δή τι τοιοῦτον ἕτερον ἢ δένδρον ἢ φρυγανῶδες, ὥσπερ δοκεῖ τό τε πήγανον καὶ ἡ ἰωνία καὶ τὸ σισύμβριον καὶ ὁ ἕρπυλλος καὶ τὸ ἑλένιον. κοινοτάτη μὲν οὖν ἐστὶ πᾶσιν ἥ τε ἀπὸ τῆς παρασπάδος καὶ ἀπὸ σπέρματος. ἅπαντα γὰρ ὅσα ἔχει σπέρματα καὶ ἀπὸ σπέρματος γίνεται· ἀπὸ δὲ παρασπάδος καὶ τὴν δάφνην φασίν, ἐάν τις τὰ ἔρνη παρελὼν φυτεύσῃ. δεῖ δὲ ὑπόρριζον εἶναι μάλιστά γε τὸ παρασπώμενον ἢ ὑπόπρεμνον. οὐ μὴν ἀλλὰ καὶ ἄνευ τούτου θέλει βλαστάνειν καὶ ῥόα καὶ μηλέα ἐαρινή· βλαστάνει δὲ καὶ ἀμυγδαλῇ φυτευομένη.

4 κατὰ πλείστους δὲ τρόπους ὡς εἰπεῖν ἡ ἐλάα βλαστάνει· καὶ γὰρ ἀπὸ τοῦ στελέχους καὶ ἀπὸ τοῦ πρέμνου κατακοπτομένου καὶ ἀπὸ τῆς ῥίζης [καὶ ἀπὸ τοῦ ξύλου] καὶ ἀπὸ ῥάβδου καὶ χάρακος ὥσπερ εἴρηται. τῶν δ' ἄλλων ὁ μύρρινος· καὶ γὰρ οὗτος ἀπὸ τῶν ξύλων καὶ τῶν πρέμνων

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[1] τά γε πολλὰ πάνθ' conj. Sch.; ἢ before πάνθ' ins. St.; τά τε πολλὰ πάνθ' Ald.

[2] εὐαυξεῖς conj. H; αὐξεῖς UMVAld.

[3] οὐκ I conj.; οὐδ' MSS.

except from root-stock and cleft wood; apple and pear grow also from branches, but rarely. However it appears that most, if not practically all,[1] trees may grow from branches, if these are smooth young and vigorous.[2] But the other methods, one may say, are more natural, and we must reckon what may occasionally occur as a mere possibility.

In fact there are quite few plants which grow and are brought into being more easily from the upper parts, as the vine is grown from branches; for this, though it cannot[3] be grown from the 'head,'[4] yet can be grown from the branch, as can all similar trees and under-shrubs, for instance, as it appears, rue gilliflower bergamot-mint tufted thyme calamint. So the commonest ways of growth with all plants are from a piece torn off or from seed; for all plants that have seeds grow also from seed. And they say that the bay too grows[5] from a piece torn off, if one takes off the young shoots and plants them; but it is necessary that the piece torn off should have part of the root or stock[6] attached to it. However the pomegranate and 'spring apple'[7] will grow even without this, and a slip of almond[8] grows if it is planted. The olive grows, one may say, in more ways than any other plant; it grows from a piece of the trunk or of the stock,[9] from the root, from a twig, and from a stake, as has been said.[10] Of other plants the myrtle also can be propagated in several ways; for this too grows from pieces of wood

[4] *πρώρας*, *cf.* Col. 3. 10. 1, *caput vitis vocat πρώραν.* Sch. restores the word, *C.P.* 3. 14. 7.

[5] *cf. C.P.* 1. 3. 2. [6] *i.e.* a 'heel' (Lat. *perna*).

[7] *cf. C.P.* 2. 11. 6; Athen. 3. 23. [8] *cf. Geop.* 10. 3. 9.

[9] *καὶ ἀπὸ τοῦ ξύλου* om. Julius Pontedeva on Varro 1. 39. 3: a gloss on *ἀπὸ τοῦ πρέμνου κατακ.* [10] 2. 1. 2.

φύεται. δεῖ δὲ καὶ τούτου καὶ τῆς ἐλάας τὰ ξύλα διαιρεῖν μὴ ἐλάττω σπιθαμιαίων καὶ τὸν φλοιὸν μὴ περιαιρεῖν.

Τὰ μὲν οὖν δένδρα βλαστάνει καὶ γίνεται κατὰ τοὺς εἰρημένους τρόπους· αἱ γὰρ ἐμφυτεῖαι καὶ οἱ ἐνοφθαλμισμοὶ καθάπερ μίξεις τινές εἰσιν ἢ κατ' ἄλλον τρόπον γενέσεις, περὶ ὧν ὕστερον λεκτέον.

II. Τῶν δὲ φρυγανωδῶν καὶ ποιωδῶν τὰ μὲν πλεῖστα ἀπὸ σπέρματος ἢ ῥίζης τὰ δὲ καὶ ἀμφοτέρως· ἔνια δὲ καὶ ἀπὸ τῶν βλαστῶν, ὥσπερ εἴρηται. ῥοδωνία δὲ καὶ κρινωνία κατακοπέντων τῶν καυλῶν, ὥσπερ καὶ ἡ ἄγρωστις. φύεται δὲ ἡ κρινωνία καὶ ἡ ῥοδωνία καὶ ὅλου τοῦ καυλοῦ τεθέντος. ἰδιωτάτη δὲ ἡ ἀπὸ δακρύου· καὶ γὰρ οὕτω δοκεῖ τὸ κρίνον φύεσθαι, ὅταν ξηρανθῇ τὸ ἀπορρυέν. φασὶ δὲ καὶ ἐπὶ τοῦ ἱπποσελίνου· καὶ γὰρ τοῦτο ἀφίησι δάκρυον. φύεται δέ τις καὶ κάλαμος, ἐάν τις διατέμνων τὰς ἡλακάτας πλαγίας τιθῇ καὶ κατακρύψῃ κόπρῳ καὶ γῇ. ἰδίως δὲ ἀπὸ ῥίζης [τῷ] φύεσθαι καὶ τὰ κεφαλόρριζα.

2 Τοσαυταχῶς δὲ οὔσης τῆς δυνάμεως τὰ μὲν πολλὰ τῶν δένδρων, ὥσπερ ἐλέχθη πρότερον, ἐν πλείοσι τρόποις φύεται· ἔνια δὲ ἀπὸ σπέρματος

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[1] ἐμφυτεῖαι conj. R. Const.; ἐμφυλέαι (with erasures) U; ἐμφυλείαι V; ἐμφυλεῖαι Ald.

[2] 2. 1. 3; *cf. C.P.* 1. 4. 4 and 6.

[3] *i.e.* bulbil. *cf.* 6. 6. 8; 9. 1. 4; *C.P.* 1. 4. 6; Plin. 21. 24.

[4] ἐπὶ conj. W.; ἀπὸ P_2Ald.

[5] δέ τις καὶ Ald,; τις om. W. after Sch.

and also from pieces of the stock. It is necessary however with this, as with the olive, to cut up the wood into pieces not less than a span long and not to strip off the bark.

Trees then grow and come into being in the above-mentioned ways; for as to methods of grafting[1] and inoculation, these are, as it were, combinations of different kinds of trees; or at all events these are methods of growth of a quite different class and must be treated of at a later stage.

II. Of under-shrubs and herbaceous plants the greater part grow from seed or a root, and some in both ways; some of them also grow from cuttings, as has been said,[2] while roses and lilies grow from pieces of the stems, as also does dog's-tooth grass. Lilies and roses also grow when the whole stem is set. Most peculiar is the method of growth from an exudation[3]; for it appears that the lily grows in this way too, when the exudation that has been produced has dried up. They say the same of[4] alexanders, for this too produces an exudation. There is a certain[5] reed also which grows if one cuts it in lengths from joint to joint and sets them[6] sideways, burying it in dung and soil. Again they say that plants which have a bulbous root are peculiar in their way of growing[7] from the root.

The capacity for growth being shewn in so many ways, most trees, as was said before,[8] originate in several ways; but some come[9] only from seed, as silver-

[6] *cf.* 1. 4. 4; Plin. 17. 145; Col. 4. 32. 2; *τιθῇ* conj. Sch.; *ἢ* Ald.; ? *θῇ*.

[7] *i.e.* by offset bulbs. Text probably defective; *cf. C.P.* 1. 4. 1. *τῷ* U; *τὸ* UMV. [8] 2. 1. 1.

[9] *φύεται* I conj.; *φησίν ἐστιν* or *φασίν ἐστιν* MSS.; *ὡς φασίν ἐστιν* Ald.; *παραγίνεται* conj. W.

φύεται μόνον, οἷον ἐλάτη πεύκη πίτυς ὅλως πᾶν τὸ κωνοφόρον· ἔτι δὲ καὶ φοῖνιξ, πλὴν εἰ ἄρα ἐν Βαβυλῶνι καὶ ἀπὸ τῶν ῥάβδων [ὥς] φασί τινες μολεύειν.[1] κυπάριττος δὲ παρὰ μὲν τοῖς ἄλλοις ἀπὸ σπέρματος, ἐν Κρήτῃ δὲ καὶ ἀπὸ τοῦ στελέχους, οἷον ἐπὶ τῆς ὀρείας ἐν Τάρρᾳ· παρὰ τούτοις γάρ ἐστιν ἡ κουριζομένη κυπάριττος· αὕτη δὲ ἀπὸ τῆς τομῆς βλαστάνει πάντα τρόπον τεμνομένη καὶ ἀπὸ γῆς καὶ ἀπὸ τοῦ μέσου καὶ ἀπὸ τοῦ ἀνωτέρω· βλαστάνει δὲ ἐνιαχοῦ καὶ ἀπὸ τῶν ῥιζῶν σπανίως δέ.

3 Περὶ δὲ δρυὸς ἀμφισβητοῦσιν· οἱ μὲν γὰρ ἀπὸ σπέρματός φασι μόνον, οἱ δὲ καὶ ἀπὸ ῥίζης γλίσχρως· οἱ δὲ καὶ ἀπ' αὐτοῦ τοῦ στελέχους κοπέντος. ἀπὸ παρασπάδος δὲ καὶ ῥίζης οὐδὲν φύεται τῶν μὴ παραβλαστανόντων.

4 Ἁπάντων δὲ ὅσων πλείους αἱ γενέσεις, ἡ ἀπὸ παρασπάδος καὶ ἔτι μᾶλλον ἡ ἀπὸ παραφυάδος ταχίστη καὶ εὐαυξής, ἐὰν ἀπὸ ῥίζης ἡ παραφυὰς ᾖ. καὶ τὰ μὲν οὕτως ἢ ὅλως ἀπὸ φυτευτηρίων πεφυτευμένα πάντα δοκεῖ τοὺς καρποὺς ἐξομοιοῦν. ὅσα δ' ἀπὸ τοῦ καρποῦ τῶν δυναμένων καὶ οὕτως βλαστάνειν, ἅπανθ' ὡς εἰπεῖν χείρω, τὰ δὲ καὶ ὅλως ἐξίσταται τοῦ γένους, οἷον ἄμπελος μηλέα συκῆ ῥοιὰ ἄπιος· ἔκ τε γὰρ τῆς κεγχραμίδος οὐδὲν γίνεται γένος ὅλως ἥμερον, ἀλλ' ἢ ἐρινεὸς ἢ ἀγρία συκῆ, διαφέρουσα πολλάκις καὶ τῇ χροιᾷ· καὶ γὰρ ἐκ μελαίνης λευκὴ καὶ ἐκ λευκῆς μέλαινα

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[1] μολεύειν conj. Sch.; μωλύειν MSS.; μοσχεύειν conj. R. Const. (*cf. C.P.* 1. 2 1). But *cf.* Hesych. *s.v.* μολεύειν.
[2] Plin. 16. 141. [3] ἐπὶ conj. W.; τὸ UMVAld.

fir fir Aleppo pine, and in general all those that bear cones: also the date-palm, except that in Babylon it may be that, as some say, they take cuttings[1] from it. The cypress in most regions grows from seed, but in Crete[2] from the trunk also, for instance in[3] the hill country about Tarra; for there grows the cypress which they clip, and when cut it shoots in every possible way, from the part which has been cut, from the ground, from the middle, and from the upper parts; and occasionally, but rarely, it shoots from the roots also.

About the oak accounts differ; some say it only grows from seed, some from the root also, but not vigorously, others again that it grows from the trunk itself, when this is cut. But no tree grows from a piece torn off or from a root except those which make side-growths.

However in all the trees which have several methods of originating the quickest method and that which promotes the most vigorous growth is from a piece torn off, or still better from a sucker, if this is taken from the root. And, while all the trees which are propagated thus or by some kind of slip[4] seem to be alike in their fruits to the original tree, those raised from the fruit, where this method of growing is also possible, are nearly all inferior, while some quite lose the character of their kind, as vine apple fig pomegranate pear. As for the fig,[5] no cultivated kind is raised from its seed, but either the ordinary wild fig or some wild kind is the result, and this often differs in colour from the parent; a black fig gives a

[4] *φυτευτήριον*: a general term including *παραφυάς* and *παρασπάς*.

[5] *cf. C.P.* 1. 9.

γίνεται· ἔκ τε τῆς ἀμπέλου τῆς γενναίας ἀγεννής· καὶ πολλάκις ἕτερον γένος· ὁτὲ δὲ ὅλως οὐδὲν ἥμερον ἀλλ' ἄγριον ἐνίοτε καὶ τοιοῦτον ὥστε μὴ ἐκπέττειν τὸν καρπόν· αἱ δ' ὥστε μηδὲ ἀδρύνειν ἀλλὰ μέχρι τοῦ ἀνθῆσαι μόνον ἀφικνεῖσθαι.

5 Φύονται δὲ καὶ ἐκ τῶν τῆς ἐλάας πυρήνων ἀγριέλαιος, καὶ ἐκ τῶν τῆς ῥόας κόκκων τῶν γλυκέων ἀγεννεῖς, καὶ ἐκ τῶν ἀπυρήνων σκληραί, πολλάκις δὲ καὶ ὀξεῖαι. τὸν αὐτὸν δὲ τρόπον καὶ ἐκ τῶν ἀπίων καὶ ἐκ τῶν μηλέων· ἐκ μὲν γὰρ τῶν ἀπίων μοχθηρὰ ἡ ἀχράς, ἐκ δὲ τῶν μηλέων χείρων τε τῷ γένει καὶ ἐκ γλυκείας ὀξεῖα, καὶ ἐκ στρουθίου Κυδώνιος. χείρων δὲ καὶ ἡ ἀμυγδαλῆ καὶ τῷ χυλῷ καὶ τῷ σκληρὰ ἐκ μαλακῆς· δι' ὃ καὶ αὐξηθεῖσαν ἐγκεντρίζειν κελεύουσιν, εἰ δὲ μὴ τὸ μόσχευμα μεταφυτεύειν πολλάκις.

6 Χείρων δὲ καὶ ἡ δρῦς· ἀπὸ γοῦν τῆς ἐν Πύρρᾳ πολλοὶ φυτεύσαντες οὐκ ἐδύναντ' ὁμοίαν ποιεῖν. δάφνην δὲ καὶ μυρρίνην διαφέρειν ποτέ φασιν, ὡς ἐπὶ τὸ πολὺ δ' ἐξίστασθαι καὶ οὐδὲ τὸ χρῶμα διασώζειν, ἀλλ' ἐξ ἐρυθροῦ καρποῦ γίνεσθαι μέλαιναν, ὥσπερ καὶ τὴν ἐν Ἀντάνδρῳ· πολλάκις δὲ καὶ τὴν κυπάριττον ἐκ θηλείας ἄρρενα. μάλιστα δὲ τούτων ὁ φοῖνιξ δοκεῖ διαμένειν ὥσπερ εἰπεῖν τελείως τῶν ἀπὸ σπέρματος, καὶ πεύκη ἡ κωνοφόρος καὶ πίτυς ἡ φθειροποιός. ταῦτα μὲν οὖν ἐν τοῖς ἡμερωμένοις. ἐν δὲ τοῖς

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[1] *φύονται* conj. W.; *φυτεύονται* Ald.H.; *φύεται* Vo.cod.Cas.
[2] *γλυκέων* conj. St.; *γλαυκίων* UMVAld.
[3] *cf.* Athen. 3. 20 and 23.
[4] *cf. C.P.* 1. 9. 1.
[5] In Lesbos; *cf.* 3. 9. 5.
[6] *cf. C.P.* 1. 9. 2.

white, and conversely. Again the seed of an excellent vine produces a degenerate result, which is often of quite a different kind; and at times this is not a cultivated kind at all, but a wild one of such a character that it does not ripen its fruit; with others again the result is that the seedlings do not even mature fruit, but only get as far as flowering.

Again the stones of the olive give[1] a wild olive, and the seeds of a sweet pomegranate[2] give a degenerate kind, while the stoneless kind gives a hard sort and often an acid fruit. So also is it with seedlings of pears and apples; pears give a poor sort of wild pears, apples produce an inferior kind which is acid instead of sweet; quince produces wild quince.[3] Almond again raised from seed is inferior in taste and in being hard instead of soft; and this is why men[4] bid us graft on to the almond, even when it is fully grown, or, failing that, frequently plant the offsets.

The oak also deteriorates from seed; at least many persons having raised trees from acorns of the oak at Pyrrha[5] could not produce one like the parent tree. On the other hand they say that bay and myrtle sometimes improve by seeding, though usually they degenerate and do not even keep their colour, but red fruit gives black—as happened with the tree in Antandros; and frequently seed of a 'female' cypress produces a 'male' tree. The date-palm seems to be about the most constant of these trees, when raised from seed, and also the 'cone-bearing pine'[6] (stone-pine) and the 'lice-bearing pine.'[7] So much for degeneration in cultivated trees; among wild kinds it is plain that more in proportion

[7] Plin. 16. 49. The 'lice' are the seeds which were eaten. *cf.* Hdt. 4. 109, *φθειροτραγέουσι*; Theocr. 5. 49.

ἀγρίοις δῆλον ὅτι πλείω κατὰ λόγον ὡς ἰσχυροτέροις· ἐπεὶ θάτερόν γε καὶ ἄτοπον, εἰ δὴ χείρω καὶ ἐν ἐκείνοις καὶ ὅλως ἐν τοῖς ἀπὸ σπέρματος μόνον· εἰ μή τι τῇ θεραπείᾳ δύνανται μεταβάλλειν.

7 Διαφέρουσι δὲ καὶ τόποι τόπων καὶ ἀὴρ ἀέρος· ἐνιαχοῦ γὰρ ἐκφέρειν ἡ χώρα δοκεῖ τὰ ὅμοια, καθάπερ καὶ ἐν Φιλίπποις· ἀνάπαλιν ὀλίγα καὶ ὀλιγαχοῦ λαμβάνειν μεταβολήν, ὥστε ἐκ σπέρματος ἀγρίου ποιεῖν ἥμερον ἢ ἐκ χείρονος ἁπλῶς βέλτιον· τοῦτο γὰρ ἐπὶ τῆς ῥόας μόνον ἀκηκόαμεν ἐν Αἰγύπτῳ καὶ ἐν Κιλικίᾳ συμβαίνειν· ἐν Αἰγύπτῳ μὲν γὰρ τὴν ὀξεῖαν καὶ σπαρεῖσαν καὶ φυτευθεῖσαν γλυκεῖαν γίνεσθαί πως ἢ οἰνώδη· περὶ δὲ Σόλους τῆς Κιλικίας περὶ ποταμὸν τὸν Πίναρον, οὗ ἡ μάχη πρὸς Δαρεῖον ἐγένετο, πᾶσαι γίνονται ἀπύρηνοι.

8 Εὔλογον δὲ καὶ εἴ τις τὸν παρ' ἡμῶν φοίνικα φυτεύοι ἐν Βαβυλῶνι, κάρπιμόν τε γίνεσθαι καὶ ἐξομοιοῦσθαι τοῖς ἐκεῖ. τὸν αὐτὸν δὲ τρόπον καὶ εἴ τις ἑτέρα προσάλληλον ἔχει καρπὸν τόπῳ· κρείττων γὰρ οὗτος τῆς ἐργασίας καὶ τῆς θεραπείας. σημεῖον δ' ὅτι μεταφερόμενα τἀκεῖθεν ἄκαρπα τὰ δὲ καὶ ὅλως ἀβλαστῆ γίνεται.

9 Μεταβάλλει δὲ καὶ τῇ τροφῇ καὶ διὰ τὴν

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[1] *i.e.* that they should improve from seed.
[2] Whereas wild trees are produced *only* from seed.
[3] *i.e.* improve a degenerate seedling.
[4] ἁπλῶς : ? om. Sch. [5] *cf. C.P.* 1. 9. 2.

degenerate from seed, since the parent trees are stronger. For the contrary[1] would be very strange, seeing that degenerate forms are found even in cultivated trees,[2] and among these only in those which are raised from seed. (As a general rule these are degenerate, though men may in some cases effect a change[3] by cultivation).

Effects of situation, climate, tendance.

Again differences in situation and climate affect the result. In some places, as at Philippi, the soil seems to produce plants which resemble their parent; on the other hand a few kinds in some few places seem to undergo a change, so that wild seed gives a cultivated form, or a poor form one actually better.[4] We have heard that this occurs, but only with the pomegranate, in Egypt[5] and Cilicia; in Egypt a tree of the acid kind both from seeds and from cuttings produces one whose fruit has a sort of sweet taste,[6] while about Soli in Cilicia near the river Pinaros (where the battle with Darius was fought) all those pomegranates raised from seed are without stones.

If anyone were to plant our palm at Babylon, it is reasonable to expect that it would become fruitful and like the palms of that country. And so would it be with any other country which has fruits that are congenial to that particular locality; for the locality[7] is more important than cultivation and tendance. A proof of this is the fact that things transplanted thence become unfruitful, and in some cases refuse to grow altogether.

There are also modifications due to feeding[8] and

[6] Or 'wine-like.' Cited by Apollon. *Hist. Mir.* 43.
[7] *οὗτος* conj. W.; *αὐτὸς* Ald.
[8] *τῇ τροφῇ* conj. W.; *τῆς τροφῆς* UMVAld.

ἄλλην ἐπιμέλειαν, οἷς καὶ τὸ ἄγριον ἐξημεροῦται καὶ αὐτῶν δὲ τῶν ἡμέρων ἔνια ἀπαγριοῦται, οἷον ῥόα καὶ ἀμυγδαλῆ. ἤδη δέ τινες καὶ ἐκ κριθῶν ἀναφῦναί φασι πυροὺς καὶ ἐκ πυρῶν κριθὰς καὶ
10 ἐπὶ τοῦ αὐτοῦ πυθμένος ἄμφω. ταῦτα μὲν οὖν ὡς μυθωδέστερα δεῖ δέχεσθαι. μεταβάλλει δ' οὖν τὰ μεταβάλλοντα τὸν τρόπον τοῦτον αὐτομάτως· ἐξαλλαγῇ δὲ χώρας, ὥσπερ ἐν Αἰγύπτῳ καὶ Κιλικίᾳ περὶ τῶν ῥοῶν εἴπομεν, οὐδὲ διὰ μίαν θεραπείαν.

Ὡσαύτως δὲ καὶ ὅπου τὰ κάρπιμα ἄκαρπα γίνεται, καθάπερ τὸ πέρσιον τὸ ἐξ Αἰγύπτου καὶ ὁ φοῖνιξ ἐν τῇ Ἑλλάδι καὶ εἴ δή τις κομίσειε τὴν ἐν Κρήτῃ λεγομένην αἴγειρον. ἔνιοι δέ φασι καὶ τὴν ὄην ἐὰν εἰς ἀλεεινὸν ἔλθῃ σφόδρα τόπον ἄκαρπον γίνεσθαι· φύσει γὰρ ψυχρόν. εὔλογον δὲ ἀμφότερα συμβαίνειν κατὰ τὰς ἐναντιώσεις, εἴπερ μηδ' ὅλως ἔνια φύεσθαι θέλει μεταβάλλοντα τοὺς τόπους. καὶ κατὰ μὲν τὰς χώρας αἱ τοιαῦται μεταβολαί.

11 Κατὰ δὲ τὴν φυτείαν τὰ ἀπὸ τῶν σπερμάτων φυτευόμενα, καθάπερ ἐλέχθη· παντοῖαι γὰρ αἱ ἐξαλλαγαὶ καὶ τούτων. τῇ θεραπείᾳ δὲ μεταβάλλει ῥόα καὶ ἀμυγδαλῆ· ῥόα μὲν κόπρον ὑείαν λαβοῦσα καὶ ὕδατος πλῆθος ῥυτοῦ· ἀμυγδαλῇ δὲ ὅταν πάτταλόν τις ἐνθῇ, καὶ τὸ δάκρυον ἀφαιρῇ τὸ ἐπιρρέον πλείω χρόνον καὶ τὴν ἄλλην ἀποδιδῷ

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[1] ἔνια ἀπαγριοῦται οἷον conj. W.; ἔνια καὶ ἀπορῇ τε ῥόα UV; ἐ. καὶ ἀπορῇ τὰ ῥόα M; ἐ. καὶ ἀπορρεῖ τὰ ῥόα Ald.
[2] *i.e.* cultivation has nothing to do with it.
[3] 2. 2. 7. [4] *cf.* 3. 3. 4. [5] Plin. 17. 242.
[6] *i.e.* improve. *cf.* 2. 2. 6 *ad fin.*

attention of other kinds, which cause the wild to become cultivated, or again cause some cultivated kinds to go wild,[1] such as pomegranate and almond. Some say that wheat has been known to be produced from barley, and barley from wheat, or again both growing on the same stool; but these accounts should be taken as fabulous. Anyhow those things which do change in this manner do so spontaneously,[2] and the alteration is due to a change of position (as we said[3] happens with pomegranates in Egypt and Cilicia), and not to any particular method of cultivation.

So too is it when fruit-bearing trees become unfruitful, for instance the *persion* when moved from Egypt, the date-palm when planted in Hellas, or the tree which is called 'poplar' in Crete,[4] if anyone should transplant it. [5]Some again say that the sorb becomes unfruitful if it comes into a very warm position, since it is by nature cold-loving. It is reasonable to suppose that both results follow because the natural circumstances are reversed, seeing that some things entirely refuse to grow when their place is changed. Such are the modifications due to position.

As to those due to method of culture, the changes which occur in things grown from seed are as was said; (for with things so grown also the changes are of all kinds). Under cultivation the pomegranate and the almond change character,[6] the pomegranate if it receives pig-manure [7] and a great deal of river water, the almond if one inserts a peg and [8] removes for some time the gum which exudes and gives the other

[7] *cf. C.P.* 2. 14. 2; 3. 9. 3; Plin. 17. 259; Col. 5. 10. 15 and 16.

[8] *cf.* 2. 7. 6; *C.P.* 1. 17. 10; 2. 14. 1; Plin. 17. 252.

12 θεραπείαν. ὡσαύτως δὲ δῆλον ὅτι καὶ ὅσα ἐξημεροῦται τῶν ἀγρίων ἢ ἀπαγριοῦται τῶν ἡμέρων· τὰ μὲν γὰρ θεραπείᾳ τὰ δ' ἀθεραπευσίᾳ μεταβάλλει· πλὴν εἴ τις λέγοι μηδὲ μεταβολὴν ἀλλ' ἐπίδοσιν εἰς τὸ βέλτιον εἶναι καὶ χεῖρον· οὐ γὰρ οἷόν τε τὸν κότινον ποιεῖν ἐλάαν οὐδὲ τὴν ἀχράδα ποιεῖν ἄπιον οὐδὲ τὸν ἐρινεὸν συκῆν. ὃ γὰρ ἐπὶ τοῦ κοτίνου φασὶ συμβαίνειν, ὥστ' ἐὰν περικοπεὶς τὴν θαλίαν ὅλως μεταφυτευθῇ φέρειν φαυλίας, μετακίνησίς τις γίνεται οὐ μεγάλη. ταῦτα μὲν οὖν ὁποτέρως δεῖ λαβεῖν οὐθὲν ἂν διαφέροι.

III. Φασὶ δ' οὖν αὐτομάτην τινὰ γίνεσθαι τῶν τοιούτων μεταβολήν, ὁτὲ μὲν τῶν καρπῶν ὁτὲ δὲ καὶ ὅλως αὐτῶν τῶν δένδρων, ἃ καὶ σημεῖα νομίζουσιν οἱ μάντεις· οἷον ῥόαν ὀξεῖαν γλυκεῖαν ἐξενεγκεῖν καὶ γλυκεῖαν ὀξεῖαν· καὶ πάλιν ἁπλῶς αὐτὰ τὰ δένδρα μεταβάλλειν, ὥστε ἐξ ὀξείας γλυκεῖαν γίνεσθαι καὶ ἐκ γλυκείας ὀξεῖαν· χεῖρον δὲ τὸ εἰς γλυκεῖαν μεταβάλλειν. καὶ ἐξ ἐρινεοῦ συκῆν καὶ ἐκ συκῆς ἐρινεόν· χεῖρον δὲ τὸ ἐκ συκῆς. καὶ ἐξ ἐλάας κότινον καὶ ἐκ κοτίνου ἐλάαν· ἥκιστα δὲ τοῦτο. πάλιν δὲ συκῆν ἐκ

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[1] περικοπεὶς conj. W.; περισκοπτεῖς U; περικόπτης Ald.

[2] φαυλίας conj. Salm.; φαύλους U; θάλος Ald. *cf.* Plin. 16. 244. These olives produced little oil, but were valued for perfumery: see *C.P.* 6. 8. 3 and 5; *de odor.*, 15.

[3] οὐ add. Salm.; om. MSS. (?) Ald.H.

attention required. In like manner plainly some wild things become cultivated and some cultivated things become wild; for the one kind of change is due to cultivation, the other to neglect:—however it might be said that this is not a change but a natural development towards a better or an inferior form; (for that it is not possible to make a wild olive pear or fig into a cultivated olive pear or fig). As to that indeed which is said to occur in the case of the wild olive, that if the tree is transplanted with its top-growth entirely cut off,[1] it produces 'coarse olives,'[2] this is no[3] very great change. However it can make no difference which way[4] one takes this.

Of spontaneous changes in the character of trees, and of certain marvels.

III. [5]Apart from these changes it is said that in such plants there is a spontaneous kind of change, sometimes of the fruit, sometimes of the tree itself as a whole, and soothsayers call such changes portents. For instance, an acid pomegranate, it is said, may produce sweet fruit, and conversely; and again, in general, the tree itself sometimes undergoes a change, so that it becomes sweet[6] instead of acid, or the reverse happens. And the change to sweet is considered a worse portent. Again a wild fig may turn into a cultivated one, or the contrary change take place; and the latter is a worse portent. So again a cultivated olive may turn into a wild one, or conversely, but the latter change is rare. So again a white fig

[4] *i.e.* whether nature or man is said to cause the admitted change. [5] Plin. 17. 242.

[6] *i.e. all* the fruit are now acid instead of sweet, or the reverse. Sch. brackets ἐξ ὀξείας . . . ὀξεῖαν.

λευκῆς μέλαιναν καὶ ἐκ μελαίνης λευκήν. ὁμοίως δὲ τοῦτο καὶ ἐπὶ ἀμπέλου.

2 Καὶ ταῦτα μὲν ὡς τέρατα καὶ παρὰ φύσιν ὑπολαμβάνουσιν· ὅσα δὲ συνήθη τῶν τοιούτων οὐδὲ θαυμάζουσιν ὅλως· οἷον τὸ τὴν κάπνειον ἄμπελον καλουμένην καὶ ἐκ μέλανος βότρυος λευκὸν καὶ ἐκ λευκοῦ μέλανα φέρειν· οὐδὲ γὰρ οἱ μάντεις τὰ τοιαῦτα κρίνουσιν· ἐπεὶ οὐδὲ ἐκεῖνα, παρ' οἷς πέφυκεν ἡ χώρα μεταβάλλειν, ὥσπερ ἐλέχθη περὶ τῆς ῥόας ἐν Αἰγύπτῳ· ἀλλὰ τὸ ἐνταῦθα θαυμαστόν, διὰ τὸ μίαν μόνον ἢ δύο, καὶ ταύτας ἐν τῷ παντὶ χρόνῳ σπανίας. οὐ μὴν ἀλλ' εἴπερ συμβαίνει, μᾶλλον ἐν τοῖς καρποῖς γίνεσθαι τὴν παραλλαγὴν ἢ ἐν ὅλοις τοῖς δένδροις.

3 Ἐπεὶ καὶ τοιαύτη τις ἀταξία γίνεται περὶ τοὺς καρπούς· οἷον ἤδη ποτὲ συκῆ τὰ σῦκα ἔφυσεν ἐκ τοῦ ὄπισθεν τῶν θρίων· καὶ ῥόα δὲ καὶ ἄμπελος ἐκ τῶν στελεχῶν, καὶ ἄμπελος ἄνευ φύλλων καρπὸν ἤνεγκεν. ἐλάα δὲ τὰ μὲν φύλλα ἀπέβαλε τὸν δὲ καρπὸν ἐξήνεγκεν· ὃ καὶ Θετταλῷ τῷ Πεισιστράτου γενέσθαι λέγεται. συμβαίνει δὲ καὶ διὰ χειμῶνας τοῦτο καὶ δι' ἄλλας αἰτίας ἔνια τῶν δοκούντων εἶναι παρὰ λόγον οὐκ ὄντων δέ· οἷον ἐλάα ποτ' ἀποκαυθεῖσα τελέως ἀνεβλάστησεν ὅλη, καὶ αὐτὴ καὶ ἡ θαλία. ἐν δὲ τῇ Βοιωτίᾳ καταβρωθέντων τῶν ἐρνῶν ὑπ' ἀττελέβων πάλιν

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[1] ἐπὶ conj. Sch.; ἐξ Ald.H.
[2] *cf. C.P.* 5. 3. 1 and 2; Arist. *de gen. an.* 4. 4; Hesych. *s.v.* καπνίας; Schol. ad Ar. *Vesp.* 151.
[3] 2. 2. 7.
[4] εἰκὸς has perhaps dropped out. Sch.
[5] θρίων conj. R. Const., *cf. C.P.* 5. 1. 7 and 8; 5. 2. 2; ἐρινεῶν P_2Ald. *cf.* also Athen. 3. 11.

may change into a black one, and conversely; and similar changes occur in[1] the vine.

Now these changes they interpret as miraculous and contrary to nature; but they do not even feel any surprise at the ordinary changes, for instance, when the 'smoky' vine,[2] as it is called, produces alike white grapes instead of black or black grapes instead of white. Of such changes the soothsayers take no account, any more than they do of those instances in which the soil produces a natural change, as was said[3] of the pomegranate in Egypt. But it is surprising when such a change occurs in our own country, because there are only one or two instances and these separated by wide intervals of time. However, if such changes occur, it is natural[4] that the variation should be rather in the fruit than in the tree as a whole. In fact the following irregularity also occurs in fruits; a fig-tree has been known to produce its figs from behind the leaves,[5] pomegranate and vines from the stem, while the vine has been known to bear fruit without leaves. The olive again has been known to lose its leaves and yet produce its fruit; this is said to have happened to Thettalos, son of Pisistratus. This may be due to inclement weather; and some changes, which seem to be abnormal, but are not really so, are due to other accidental causes;[6] for instance, there was an olive that, after being completely burnt down, sprang up again entire, the tree and all its branches. And in Boeotia an olive whose young shoots[7] had been eaten off by locusts grew again: in this case however[8] the

[6] *cf.* Hdt. 8. 55; Plin. 17. 241.

[7] ἐρνῶν conj. Sch.; ἔργων P_2Ald.; κλάδων mU.

[8] *i.e.* the portent was not so great as in the other case quoted, as the tree itself had not been destroyed.

ἀνεβλάστησε· τὰ δ' οἷον ἀπέπεσεν. ἥκιστα δ' ἴσως τὰ τοιαῦτα ἄτοπα διὰ τὸ φανερὰς ἔχειν τὰς αἰτίας, ἀλλὰ μᾶλλον τὸ μὴ ἐκ τῶν οἰκείων τόπων φέρειν τοὺς καρποὺς ἢ μὴ οἰκείους· καὶ μάλιστα δ' εἰ τῆς ὅλης φύσεως γίνεται μεταβολή, καθάπερ ἐλέχθη. περὶ μὲν οὖν τὰ δένδρα τοιαῦταί τινές εἰσι μεταβολαί.

IV. Τῶν δὲ ἄλλων τό τε σισύμβριον εἰς μίνθαν δοκεῖ μεταβάλλειν, ἐὰν μὴ κατέχηται τῇ θεραπείᾳ, δι' ὃ καὶ μεταφυτεύουσι πολλάκις, καὶ ὁ πυρὸς εἰς αἶραν. ταῦτα μὲν οὖν ἐν τοῖς δένδροις αὐτομάτως, εἴπερ γίνεται. τὰ δ' ἐν τοῖς ἐπετείοις διὰ παρασκευῆς· οἷον ἡ τίφη καὶ ἡ ζειὰ μεταβάλλουσιν εἰς πυρὸν ἐὰν πτισθεῖσαι σπείρωνται, καὶ τοῦτ' οὐκ εὐθὺς ἀλλὰ τῷ τρίτῳ ἔτει. σχεδὸν δὲ παραπλήσιον τοῦτό γε τῷ τὰ σπέρματα κατὰ τὰς χώρας μεταβάλλειν· μεταβάλλει γὰρ καὶ ταῦτα καθ' ἑκάστην χώραν καὶ σχεδὸν ἐν τῷ ἴσῳ χρόνῳ καὶ ἡ τίφη. μεταβάλλουσι δὲ καὶ οἱ ἄγριοι πυροὶ καὶ αἱ κριθαὶ θεραπευόμεναι καὶ ἐξημερούμεναι κατὰ τὸν ἴσον χρόνον.

2 Καὶ ταῦτα μὲν ἔοικε χώρας τε μεταβολῇ καὶ θεραπείᾳ γίνεσθαι· καὶ ἔνια ἀμφοτέροις, τὰ δὲ τῇ θεραπείᾳ μόνον· οἷον πρὸς τὸ τὰ ὄσπρια μὴ γίνεσθαι ἀτεράμονα βρέξαντα κελεύουσιν ἐν νίτρῳ

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[1] οἰκείους· καὶ I conj.; οἰκειοῦται UMV; οἰκείως Ald.H.; ἐοικότας conj. W. [2] εἰ ins. Sch. [3] 2. 3. 1.
[4] *cf.* 6. 7. 2; Plin. 19. 176.
[5] *i.e.* to prevent the change which cultivated soil induces.

shoots had, so to speak, only been shed. But after all such phenomena are perhaps far from strange, since the cause in each case is obvious; rather is it strange that trees should bear fruit not at the places where it naturally forms, or else fruit which does not belong to the character[1] of the tree. And most surprising of all is it when,[2] as has been said,[3] there is a change in the entire character of the tree. Such are the changes which occur in trees.

Of spontaneous and other changes in other plants.

IV. [4] Of other plants it appears that bergamot-mint turns into cultivated mint, unless it is fixed by special attention; and this is why men frequently transplant[5] it; [6] so too wheat turns into darnel. Now in trees such changes, if they occur, are spontaneous, but in annual plants they are deliberately brought about: for instance, one-seeded wheat and rice-wheat change[7] into wheat, if bruised before they are sown; and this does not happen at once, but in the third year. This change resembles that produced in the seeds by difference of soil[8]; for these grains vary according to the soil, and the change takes about the same time as that which occurs in one-seeded wheat. Again wild wheats and barleys also with tendance and cultivation change in a like period.

These changes appear to be due to change of soil and cultivation, and in some cases the change is due to both, in others to cultivation alone; for instance, in order that pulses may not become uncookable,[9]

[6] But see reff. under ἄῤῥα in Index.
[7] *cf. C.P.* 5. 6. 12; Plin. 18. 93.
[8] χώραν conj. St.; ὥραν Ald.H.
[9] ἀτεράμονα conj. W.; ἀτέραμνα UAld. *cf.* 8. 8. 6 and 7: *C.P.* 4. 7. 2; 4. 12. 1 and 8; *Geop.* 2. 35. 2; 2. 41.

νύκτα τῇ ὑστεραίᾳ σπείρειν ἐν ξηρᾷ· φακοὺς ὥστε ἁδροὺς γίνεσθαι φυτεύουσιν ἐν βολίτῳ· τοὺς ἐρεβίνθους δέ, ὥστε μεγάλους, αὐτοῖς τοῖς κελύφεσι βρέξαντα σπείρειν. μεταβάλλουσι δὲ καὶ κατὰ τὰς ὥρας τοῦ σπόρου πρὸς κουφότητα καὶ ἀλυπίαν· οἷον ἐάν τις τοὺς ὀρόβους ἐαρινοὺς σπείρῃ τρισάλυποι γίνονται, καὶ οὐχ ὡς οἱ μετοπωρινοὶ βαρεῖς.

3 Γίνεται δὲ καὶ ἐν τοῖς λαχάνοις μεταβολὴ διὰ τὴν θεραπείαν· οἷον τὸ σέλινον, ἐὰν σπαρὲν καταπατηθῇ καὶ κυλινδρωθῇ, ἀναφύεσθαί φασιν οὖλον. μεταβάλλει δὲ καὶ τὴν χώραν ἐξαλλάττοντα, καθάπερ καὶ τἆλλα. καὶ τὰ μὲν τοιαῦτα κοινὰ πάντων ἐστίν. εἰ δὲ κατά τινα πήρωσιν ἢ ἀφαίρεσιν μέρους δένδρον ἄγονον γίνεται, καθάπερ τὰ ζῶα, τοῦτο σκεπτέον· οὐδὲν γοῦν φανερὸν κατά γε τὴν διαίρεσιν εἰς τὸ πλείω καὶ ἐλάττω φέρειν ὥσπερ κακούμενον, ἀλλ' ἢ ἀπόλλυται τὸ ὅλον ἢ διαμένον καρποφορεῖ. τὸ δὲ γῆρας κοινή τις φθορὰ πᾶσιν.

4 Ἄτοπον δ' ἂν δόξειε μᾶλλον εἰ ἐν τοῖς ζώοις αἱ τοιαῦται μεταβολαὶ φυσικαὶ καὶ πλείους· καὶ γὰρ κατὰ τὰς ὥρας ἔνια δοκεῖ μεταβάλλειν, ὥσπερ ὁ ἱέραξ καὶ ἔποψ καὶ ἄλλα τῶν ὁμοίων ὀρνέων. καὶ κατὰ τὰς τῶν τόπων ἀλλοιώσεις, ὥσπερ ὁ ὕδρος εἰς ἔχιν ξηραινομένων τῶν λιβά-

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[1] *νύκτα* I conj.; *νυκτὶ* MSS.

[2] *ἐν βολίτῳ* conj. Milas. on *Geop.* 3. 27; *ἔμβολον* UMV Ald. *cf. C.P.* 5. 6. 11; Col. 2. 10. 15; Plin. 18. 198.

[3] *cf. C.P.* 5. 6. 11; *Geop.* 2. 3. 6.

[4] *ἀλυπίαν* conj. Sch.; *δι' ἀλυπίας* M; *δι' ἀλυπίαν* Ald.

men bid one moisten the seed in nitre for a night [1] and sow it in dry ground the next day. To make lentils vigorous they plant the seeds in dung [2]; to make chick-peas large they bid one moisten the seed while still in the pods,[3] before sowing. Also the time of sowing makes differences which conduce to digestibility and harmlessness [4]: thus, if one sows vetches [5] in spring, they become quite harmless and are not indigestible like those sown in autumn.

Again in pot-herbs change is produced by cultivation; for instance, they say that,[6] if celery seed is trodden and rolled in after sowing, it comes up curly; it also varies from change of soil, like other things. Such variations are common to all; we must now consider whether a tree, like animals, becomes unproductive from mutilation or removal of a part. At all events it does not appear that division [7] is an injury, as it were, which affects the amount of fruit produced; either the whole tree perishes, or else, if it survives,[8] it bears fruit. Old age however is a cause which in all plants puts an end to life. . . . .[9]

It would seem more surprising if [10] the following changes occurred in animals naturally and frequently; some animals do indeed seem to change according to the seasons, for instance, the hawk the hoopoe and other similar birds. So also changes in the nature of the ground produce changes in animals, for instance, the water-snake changes into a viper, if the marshes

[5] *cf.* Plin. 18. 139; Col. 2. 10. 34.
[6] *cf. C.P.* 5. 6. 7; *Geop.* 12. 23. 2.
[7] γε conj. Sch.; τε Ald.
[8] διάμενον conj. Sch; διαμένοντα Ald.
[9] Something seems to have been lost at the end of § 3.
[10] εἰ ins. Sch.; τοιαῦται may however mean 'the above-mentioned,' and refer to something which has been lost.

δων. φανερώτατα δὲ καὶ κατὰ τὰς γενέσεις ἔνια, καὶ μεταβάλλει διὰ πλειόνων ζώων· οἷον ἐκ κάμπης γίνεται χρυσαλλὶς εἶτ' ἐκ ταύτης ψυχή· καὶ ἐπ' ἄλλων δ' ἐστὶ τοῦτο πλειόνων, οὐδὲν ἴσως ἄτοπον, οὐδ' ὅμοιον τὸ ζητούμενον. ἀλλ' ἐκεῖνο συμβαίνει περὶ τὰ δένδρα καὶ ὅλως πᾶσαν τὴν ὕλην, ὥσπερ ἐλέχθη καὶ πρότερον, ὥστε αὐτομάτην μεταβλαστάνειν μεταβολῆς τινος γινομένης ἐκ τῶν οὐρανίων τοιαύτης. τὰ μὲν οὖν περὶ τὰς γενέσεις καὶ μεταβολὰς ἐκ τούτων θεωρητέον.

V. Ἐπεὶ δὲ καὶ αἱ ἐργασίαι καὶ αἱ θεραπεῖαι μεγάλα συμβάλλονται, καὶ ἔτι πρότερον αἱ φυτεῖαι καὶ ποιοῦσι μεγάλας διαφοράς, λεκτέον καὶ περὶ τούτων.

Καὶ πρῶτον περὶ τῶν φυτειῶν. αἱ μὲν οὖν ὧραι πρότερον εἴρηνται καθ' ἃς δεῖ. τὰ δὲ φυτὰ λαμβάνειν κελεύουσιν ὡς κάλλιστα καὶ ἐξ ὁμοίας γῆς εἰς ἣν μέλλεις φυτεύειν, ἢ χείρονος· τοὺς δὲ γυροὺς προορύττειν ὡς πλείστου χρόνου καὶ βαθυτέρους αἰεὶ καὶ τοῖς ἐπιπολαιορριζοτέροις.

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[1] *i.e.* in the instance given the development of an insect exhibits, not one, but a series of changes from one creature to another.

[2] Whereas the metamorphoses mentioned above are independent of climatic conditions.

[3] δὲ conj. W.; τε Ald.

[4] κάλλιστα conj. W., *cf. C.P.* 3. 24. 1; τάχιστα MVAld.; τὰ χίστα U.

dry up. Most obvious are certain changes in regard to the way in which animals are produced, and such changes run through a series of creatures[1]; thus a caterpillar changes into a chrysalis, and this in turn into the perfect insect; and the like occurs in a number of other cases. But there is hardly anything abnormal in this, nor is the change in plants, which is the subject of our enquiry, analogous to it. That kind of change occurs in trees and in all woodland plants generally, as was said before, and its effect is that, when a change of the required character occurs in the climatic conditions, a spontaneous change in the way of growth ensues.[2] These instances must suffice for investigation of the ways in which plants are produced or modified.

Of methods of propagation, with notes on cultivation.

V. Since however methods of cultivation and tendance largely contribute, and, before these, methods of planting, and cause great differences, of these too we must speak.

And first of methods of planting: as to the seasons, we have already stated at what seasons one should plant. Further[3] we are told that the plants chosen should be the best possible,[4] and should be taken from soil resembling that in which you are going to plant them, or else inferior[5]; also the holes should be dug[6] as long as possible beforehand, and should always be deeper than the original holes, even for those whose roots do not run very deep.

[5] *i.e.* the shift should be into better soil, if possible. *cf. C.P.* 3. 5. 2.

[6] γυρὸν προορύττειν conj. R. Const.; κυρὸν προσορύττειν UMVAld. *cf. C.P.* 3. 4. 1.

2 Λέγουσι δέ τινες ὡς οὐδεμία κατωτέρω διϊκνεῖται τριῶν ἡμιποδίων· δι' ὃ καὶ ἐπιτιμῶσι τοῖς ἐν μείζονι βάθει φυτεύουσιν· οὐκ ἐοίκασι δὲ ὀρθῶς λέγειν ἐπὶ πολλῶν· ἀλλ' ἐὰν ἢ χώματος ἐπιλάβηται βαθέος ἢ καὶ χώρας τοιαύτης ἢ καὶ τόπου, πολλῷ μακροτέραν ὠθεῖ τὸ τῇ φύσει βαθύρριζον. πεύκην δέ τις ἔφη μεταφυτεύων μεμοχλευμένην μείζω τὴν ῥίζαν ἔχειν ὀκτάπηχυν καίπερ οὐχ ὅλης ἐξαιρεθείσης ἀλλ' ἀπορραγείσης.

3 Τὰ δὲ φυτευτήρια ἐὰν μὲν ἐνδέχηται ὑπόρριζα, εἰ δὲ μή, δεῖ μᾶλλον ἀπὸ τῶν κάτω ἢ τῶν ἄνω λαμβάνειν, πλὴν ἀμπέλου· καὶ τὰ μὲν ἔχοντα ῥίζας ὀρθὰ ἐμβάλλειν, τὰ δὲ μὴ ἔχοντα ὑποβάλλειν τοῦ φυτευτηρίου ὅσον σπιθαμὴν ἢ μικρῷ πλεῖον. ἔνιοι δὲ κελεύουσι καὶ τῶν ὑπορρίζων ὑποβάλλειν, τιθέναι δὲ καὶ τὴν θέσιν ὁμοίως ἥνπερ εἶχεν ἐπὶ τῶν δένδρων τὰ πρόσβορρα καὶ τὰ πρὸς ἕω καὶ τὰ πρὸς μεσημβρίαν. ὅσα δὲ ἐνδέχεται τῶν φυτῶν καὶ προμοσχεύειν· τὰ μὲν ἐπ' αὐτῶν τῶν δένδρων, οἷον ἐλάας ἀπίου μηλέας συκῆς· τὰ δ' ἀφαιροῦντας, οἷον ἀμπέλου· ταύτην γὰρ οὐχ οἷόν τε ἐπ' αὐτῆς μοσχεύειν.

4 Ἐὰν δὲ μὴ ὑπόρριζα τὰ φυτὰ μηδὲ ὑπόπρεμνα

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[1] ἀλλ' ἐὰν . . . τοιούτου. ἐὰν ἢ μὲν σώματος M ; so V, but ᾖ ; ἢ om. PAld.; χώματος H ; κενώματος for σώματος and εὐδιάδου for ἢ καὶ τόπου conj. W. χώρας refers to exposure, etc., τόπου (sc. τοιούτου) to quality of soil : so G.

[2] Plin. 16. 129 ; Xen. *Oec.* 19. 3. [3] *cf. C.P.* 3. 6.

Some say that no root goes down further than a foot and a half, and accordingly they blame those who plant deeper. However there are many instances in which it appears that what they say does not hold good; a plant which is naturally deep-rooting pushes much deeper if it finds either a deep mass of soil or a position which favours such growth or again the kind of ground which favours it.[1] In fact,[2] a man once said that when he was transplanting a fir which he had uprooted with levers, he found that it had a root more than eight cubits long, though the whole of it had not been removed, but it was broken off.

The slips for planting should be taken, if possible, with roots attached, or, failing that, from the lower[3] rather than from the higher parts of the tree, except in the case of the vine; those that have roots should be set upright,[4] while in the case of those which have none about[5] a handsbreadth or rather more of the slip should be buried. Some say that part even of those which have roots should be buried, and that the position[6] should be the same as that of the tree from which the slip was taken, facing north or east or south, as the case may be. With those plants with which it is possible, shoots from the boughs should also, they say, be planted, some being set on the trees themselves,[7] as with olive pear apple and fig, but in other cases, as in that of the vine, they must be set separately, for that the vine cannot be grafted on itself.

If the slips cannot be taken with root or stock

[1] *cf. C.P.* 3. 6. 4; Xen. *Oec.* 19. 9.
[2] ὅσον conj. Sch.; οἷον P_2Ald.
[3] *cf. C.P.* 3. 5. 2. [4] *i.e.* grafted.

λαμβάνειν, καθάπερ τῆς ἐλάας, σχίσαντά τε τὸ ξύλον κάτωθεν καὶ λίθον ἐμβαλόντα φυτεύειν· ὁμοίως δὲ καὶ τῆς ἐλάας καὶ συκῆς καὶ τῶν ἄλλων. φυτεύεται δὲ ἡ συκῆ καὶ ἐάν τις κράδην παχεῖαν ἀποξύνας σφύρᾳ παίῃ, ἄχρι οὗ ἂν ἀπολίπῃ μικρὸν ὑπὲρ τῆς γῆς, εἶτ' αὐτῆς ἄμμον βαλὼν ἄνωθεν ἐπιχώσῃ· καὶ γίνεσθαι δή φασι καὶ καλλίω ταῦτα τὰ φυτά, μέχρι οὗ ἂν ᾖ νέα.

5 Παραπλησία καὶ τῶν ἀμπέλων, ὅταν ἀπὸ τοῦ παττάλου· προοδοποιεῖ γὰρ ὁ πάτταλος ἐκείνῳ τῷ κλήματι διὰ τὴν ἀσθένειαν· φυτεύουσιν οὕτω καὶ ῥόαν καὶ ἄλλα τῶν δένδρων. ἡ συκῆ δέ, ἐὰν ἐν σκίλλῃ φυτευθῇ, θᾶττον παραγίνεται καὶ ἧττον ὑπὸ σκωλήκων κατεσθίεται. ὅλως δὲ πᾶν ἐν σκίλλῃ φυτευόμενον εὐβλαστὲς καὶ θᾶττον αὐξάνεται. ὅσα δὲ ἐκ τοῦ στελέχους καὶ διακοπτόμενα φυτεύεται, κάτω τρέποντα τὴν τομὴν δεῖ φυτεύειν, διακόπτειν δὲ μὴ ἐλάττω σπιθαμιαίων, ὥσπερ ἐλέχθη, καὶ τὸν φλοιὸν προσεῖναι· φύεται δ' ἐκ τῶν τοιούτων ἔρνη· βλαστανόντων δ' ἀεὶ προσχωννύειν, ἄχρι οὗ ἂν γένηται ἄρτιον· αὕτη μὲν οὖν τῆς ἐλάας ἰδία καὶ τοῦ μυρρίνου, αἱ δ' ἄλλαι κοινότεραι πᾶσιν.

6 Ἄριστον δὲ καὶ ῥιζώσασθαι καὶ φυτείας μάλιστα τῆς τυχούσης ἡ συκῆ. φυτεύειν δὲ ῥόας μὲν

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[1] ἡ before τῆς om. W. [2] τε τὸ conj. W.; τό τε MVP.
[3] καὶ τῆς ἐλαίας U; ἐλάας MVP; so W.
[4] Plin. 17, 123. [5] *cf. C.P.* 3. 12. 1.
[6] *cf.* 7. 13. 4; *C.P.* 5. 6. 10 (where another bulb, σχῖνος, is mentioned as being put to the same use); Athen. 3. 13; Plin. 17. 87.

attached, as with the olive,[1] they say that one must[2] split the wood at the lower end and plant with a stone on top; and the fig and other trees must be treated in like manner with the olive.[3] The fig[4] is also propagated by sharpening a stout shoot and driving it in with a hammer, till only a small piece of it is left above ground, and then piling sand above so as to earth it up; and they say that the plants thus raised grow finer up to a certain age.

Similar is the method used with vines, when they are propagated by the 'peg'[5] method; for the peg makes a passage for that sort of shoot on account of its weakness; and in the same manner men plant the pomegranate and other trees. The fig progresses more quickly and is less eaten by grubs, if the cutting is set in a squill-bulb[6]; in fact anything so planted is vigorous and grows faster. All those trees which are propagated by pieces cut from the stem should be planted with the cut part downwards,[7] and the pieces cut off should not be less than a handsbreadth in length, as was said,[8] and the bark should be left on. From such pieces new shoots grow, and as they grow, one should keep on heaping up earth about them, till the tree becomes strong.[9] This kind of propagation is peculiar to the olive and myrtle, while the others are more or less common to all trees.

The fig is better than any other tree at striking roots, and will, more than any other tree, grow by any method of propagation.[10] We are told that,

[7] *cf. Geop.* 9. 11. 8.

[8] 2. 5. 3, where however the method of propagation is different.

[9] ἄρτιον Ald.; ἀρτιτελῆ conj. W. (*quoad satis corroboretur* G; *donec robur planta capiat* Plin. 17. 124); ἄρτιτεων U; ἄρτι -έων MV; ἄρτι τεῶν P_2.

[10] *cf. C.P.* 3. 7.

καὶ μυρρίνους καὶ δάφνας πυκνὰς κελεύουσι, μὴ πλέον διεστώσας ἢ ἐννέα πόδας, μηλέας δὲ μικρῷ μακρότερον, ἀπίους δὲ καὶ ὄγχνας ἔτι μᾶλλον, ἀμυγδαλᾶς δὲ καὶ συκᾶς πολλῷ πλέον, ὡσαύτως δὲ καὶ τὴν ἐλάαν. ποιεῖσθαι δὲ καὶ πρὸς τὸν τόπον τὰς ἀποστάσεις· ἐν γὰρ τοῖς ὀρεινοῖς ἐλάττους[2] ἢ ἐν τοῖς πεδεινοῖς.

7 Μέγιστον δὲ ὡς εἰπεῖν τὸ τὴν πρόσφορον ἑκάστῳ χώραν ἀποδιδόναι· τότε γὰρ εὐθενεῖ μάλιστα. ὡς δ' ἁπλῶς εἰπεῖν ἐλάᾳ μὲν καὶ συκῇ καὶ ἀμπέλῳ τὴν πεδεινήν φασιν οἰκειοτάτην εἶναι, τοῖς δὲ ἀκροδρύοις τὰς ὑπωρείας. χρὴ δὲ καὶ ἐν αὐτοῖς τοῖς ὁμογενέσι μὴ ἀγνοεῖν τὰς οἰκείας. ἐν πλείστῃ δὲ ὡς εἰπεῖν διαφορᾷ τὰ τῶν ἀμπέλων ἐστίν· ὅσα γάρ ἐστι γῆς εἴδη, τοσαῦτά τινές φασι καὶ ἀμπέλων εἶναι. φυτευόμενα μὲν οὖν κατὰ φύσιν ἀγαθὰ γίνεσθαι παρὰ φύσιν δὲ ἄκαρπα. ταῦτα μὲν οὖν ὥσπερ κοινὰ πάντων.

VI. Τῶν δὲ φοινίκων ἴδιος ἡ φυτεία παρὰ τἆλλα καὶ ἡ μετὰ ταῦτα θεραπεία. φυτεύουσι γὰρ πλείους εἰς ταὐτὸ τιθέντες δύο κάτω καὶ δύο ἄνωθεν ἐπιδοῦντες, πρανεῖς δὲ πάντας. τὴν γὰρ ἔκφυσιν οὐκ ἐκ τῶν ὑπτίων καὶ κοίλων ποιεῖται, καθάπερ τινές φασιν, ἀλλ' ἐκ τῶν ἄνω, δι' ὃ καὶ ἐν τῇ ἐπιζεύξει τῶν ἐπιτιθεμένων οὐ δεῖ περικαλύπτειν τὰς ἀρχὰς ὅθεν ἡ ἔκφυσις· φανεραὶ δ'

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[1] ἐλάαν conj. Bod. (*cf.* Plin. 17. 88); ῥοιὰν UAld.H.
[2] ἐλάττονι conj. Sch.; ἔλαττον Ald.
[3] *i.e.* apples pears plums, etc.

in planting the pomegranate myrtle or bay, one should set two trees close together, not further than nine feet apart, apples a little further, pears and wild pears still further, almonds and figs further still, and in like manner the olive.[1] Again the distance apart must be regulated by the nature of the ground, being less [2] in hilly parts than in low ground.

Most important of all, one may say, is it to assign to each the suitable soil; for then is the tree most vigorous. Speaking generally, they say that low ground is most suitable for the olive fig and vine, and the lower slopes of hills for fruit trees.[3] Nor should one fail to note what soil suits each variety even of those closely related. There is the greatest difference, one may say, between the different kinds of vine: for they say that there are as many kinds of vine as there are of soil. If they are planted as their nature requires, they turn out well, if otherwise, they are unfruitful. And these remarks apply almost equally to all trees.

Of the propagation of the date-palm; of palms in general.

VI. [4] The method of propagating date-palms is peculiar and exceptional, as also is their subsequent cultivation. They plant several seeds together, putting two below and two above, which are fastened on; but all face downwards.[5] For germination starts not, as some say, from the 'reverse' or hollow side,[6] but from the part [7] which is uppermost; wherefore in joining on the seeds which are placed above one must not cover up the points from which the growth

[4] Plin. 13. 32.
[5] *i.e.* with the grooved side downwards.
[6] *i.e.* the grooved side. [7] *i.e.* the round side.

εἰσὶ τοῖς ἐμπείροις. διὰ τοῦτο δ' εἰς τὸ αὐτὸ πλείους τιθέασιν ὅτι ἀπὸ τοῦ ἑνὸς ἀσθενὴς ἡ φυτεία. τούτων δὲ αἵ τε ῥίζαι πρὸς ἀλλήλας συμπλέκονται καὶ εὐθὺς αἱ πρῶται βλαστήσεις, ὥστε ἓν γίνεσθαι τὸ στέλεχος.

2 Ἡ μὲν οὖν ἀπὸ τῶν καρπῶν φυτεία τοιαύτη τις· ἡ δ' ἀφ' αὑτοῦ, ὅταν ἀφέλωσι τὸ ἄνω ἐν ᾧπερ ὁ ἐγκέφαλος· ἀφαιροῦσι δὲ ὅσον δίπηχυ· σχίσαντες δὲ τοῦτο κάτω τιθέασι τὸ ὑγρόν· φιλεῖ δὲ χώραν ἀλμώδη· δι' ὃ καὶ ὅπου μὴ τοιαύτη τυγχάνει περιπάττουσιν ἅλας οἱ γεωργοί· τοῦτο δὲ δεῖ ποιεῖν μὴ περὶ αὐτὰς τὰς ῥίζας ἀλλ' ἄποθεν ἀποστήσαντα περιπάττειν ὅσον ἡμίεκτον· ὅτι δὲ τοιαύτην ζητεῖ χώραν κἀκεῖνο ποιοῦνται σημεῖον· πανταχοῦ γὰρ ὅπου πλῆθος φοινίκων ἀλμώδεις αἱ χῶραι· καὶ γὰρ ἐν Βαβυλῶνί φασιν, ὅπου οἱ φοίνικες πεφύκασι, καὶ ἐν Λιβύῃ δὲ καὶ ἐν Αἰγύπτῳ καὶ Φοινίκῃ καὶ τῆς Συρίας δὲ τῆς κοίλης, ἐν ᾗ γ' οἱ πλεῖστοι τυγχάνουσιν, ἐν τρισὶ μόνοις τόποις ἁλμώδεσιν εἶναι τοὺς δυναμένους θησαυρίζεσθαι· τοὺς δ' ἐν τοῖς ἄλλοις οὐ διαμένειν ἀλλὰ σήπεσθαι, χλωροὺς δ' ἡδεῖς εἶναι καὶ καταναλίσκειν οὕτω.

3 Φιλεῖ δὲ καὶ ὑδρείαν σφόδρα τὸ δένδρον· περὶ δὲ κόπρου διαμφισβητοῦσιν· οἱ μὲν γὰρ οὔ φασι χαίρειν ἀλλ' ἐναντιώτατον εἶναι, οἱ δὲ καὶ χρῆσθαι καὶ ἐπίδοσιν πολλὴν ποιεῖν. δεῖν δ' ὑδρεύειν εὖ μάλα κατὰ τῆς κόπρου, καθάπερ οἱ ἐν

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[1] *i.e.* 'cabbage.'

[2] τοῦτο . . . ὑγρόν : I have inserted δὲ, otherwise retaining the reading of Ald.; τούτου κάτω· τιθέασι δ' ἔνυγρον conj. W. *cf.* Plin. 13. 36. τὸ ὑγρόν, viz. the cut end.

[3] ἁλμώδη conj. W.; ἀμμώδη P_2Ald.H.

is to come; and these can be recognised by experts. And the reason why they set several together is that a plant that grows from one only is weak. The roots which grow from these seeds become entangled together and so do the first shoots from the very start, so that they combine to make a single stem.

Such is the method of growing from the fruits. But propagation is also possible from the tree itself, by taking off the top, which contains the 'head.'[1] They take off about two cubits' length, and, splitting it, set the moist end.[2] It likes a soil which contains salt[3]; wherefore, where such soil is not available, the growers sprinkle salt about it; and this must not be done about the actual roots: one must keep the salt some way off and sprinkle about a gallon. To shew that it seeks such a soil they offer the following proof; wherever date-palms grow abundantly, the soil is salt,[4] both in Babylon, they say, where the tree is indigenous, in Libya in Egypt and in Phoenicia; while in Coele-Syria, where are[5] most palms, only in three districts, they say, where the soil is salt, are dates produced which can be stored; those that grow in other districts do not keep, but rot, though when fresh they are sweet and men use[6] them at that stage.

[7]The tree is likewise very fond of irrigation; as to dung there is a difference of opinion: some say that the date-palm does not like it, but that it is most injurious, others that it gladly accepts[8] it and makes good growth thereby, but plenty of water should be

[1] Plin. 13. 28.

[2] ἀλμώδεις conj. W.; ἀμμώδεις Ald. H.

[3] ἐν ᾗ γ' οἱ conj. W.; ἵν' Ἰνδοὶ U; ἣν Ἰνδοὶ MV Ald.

[4] καταναλίσκειν Ald.; καταναλίσκεσθαι conj. W.

[5] καὶ χρῆσθαι conj. Sch.; κεχρῆσθαι Ald.; ? κεχάρησθαι.

Ῥόδῳ. τοῦτο μὲν οὖν ἐπισκεπτέον· ἴσως γὰρ οἱ μὲν οὕτως οἱ δ' ἐκείνως θεραπεύουσιν, καὶ μετὰ μὲν τοῦ ὕδατος ὠφέλιμον ἡ κόπρος ἄνευ δὲ τούτου βλαβερά. ὅταν δὲ ἐνιαύσιος γένηται, μεταφυτεύουσι καὶ τῶν ἀλῶν συμπαραβάλλουσι, καὶ πάλιν ὅταν διετής· χαίρει γὰρ σφόδρα τῇ μεταφυτείᾳ.

4 Μεταφυτεύουσι δὲ οἱ μὲν ἄλλοι τοῦ ἦρος· οἱ δὲ ἐν Βαβυλῶνι περὶ τὸ ἄστρον, ὅτε καὶ ὅλως οἵ γε πολλοὶ φυτεύουσιν, ὡς καὶ παραγινομένου καὶ αὐξανομένου θᾶττον. νέου μὲν ὄντος οὐχ ἅπτονται, πλὴν ἀναδοῦσι τὴν κόμην, ὅπως ὀρθοφυῆ τ' ᾖ καὶ αἱ ῥάβδοι μὴ ἀπαρτῶνται. μετὰ δὲ ταῦτα περιτέμνουσιν, ὁπόταν ἀδρὸς ἤδη γένηται καὶ πάχος ἔχῃ. ἀπολείπουσι δὲ ὅσον σπιθαμὴν τῶν ῥάβδων. φέρει δὲ ἕως μὲν ἂν ᾖ νέος ἀπύρηνον τὸν καρπόν, μετὰ δὲ τοῦτο πυρηνώδη.

5 Ἄλλοι δέ τινες λέγουσιν ὡς οἵ γε κατὰ Συρίαν οὐδεμίαν προσάγουσιν ἐργασίαν ἀλλ' ἢ διακαθαίρουσι καὶ ἐπιβρέχουσιν, ἐπιζητεῖν δὲ μᾶλλον τὸ ναματιαῖον ὕδωρ ἢ τὸ ἐκ τοῦ Διός· εἶναι δὲ πολὺ τοιοῦτον ἐν τῷ αὐλῶνι ἐν ᾧ καὶ τὰ φοινικόφυτα τυγχάνει, τὸν αὐλῶνα δὲ τοῦτον λέγειν τοὺς Σύρους ὅτι διατείνει διὰ τῆς Ἀραβίας μέχρι τῆς ἐρυθρᾶς θαλάσσης καὶ πολλοὺς φάσκειν ἐληλυθέναι· τούτου δὲ ἐν τῷ κοιλοτάτῳ πεφυκέναι τοὺς φοίνικας. ταῦτα μὲν οὖν τάχ' ἀμφοτέρως ἂν εἴη· κατὰ γὰρ τὰς χώρας, ὥσπερ καὶ

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[1] *cf.* 7. 5. 1. [2] Plin. 13. 37.
[3] *συμπαραβάλλουσι* conj. Sch. from G; *συμπαραλαμβάνουσι* UAld. [4] *cf.* Plin. 13. 38.

given, after manuring, as the Rhodians use. This then is matter for enquiry; it may be that there are two distinct methods of cultivation, and that dung, if accompanied by watering,[1] is beneficial, though without it it is harmful. [2] When the tree is a year old, they transplant it and give plenty[3] of salt, and this treatment is repeated when it is two years old, for it delights greatly in being transplanted.

[4] Most transplant in the spring, but the people of Babylon about the rising of the dog-star, and this is the time when most people propagate it, since it then germinates and grows more quickly. As long as it is young, they do not touch it, except that they tie up the foliage, so that it may grow straight[5] and the slender branches may not hang down.[6] At a later stage they prune it, when it is more vigorous and has become a stout tree, leaving the slender branches only about a handsbreadth long. So long as it is young, it produces its fruit without a stone, but later on the fruit has a stone.

However some say that the people of Syria use no cultivation, except cutting out wood and watering, also that the date-palm requires spring water rather than water from the skies; and that such water is abundant in the valley in which are the palm-groves. And they add that the Syrians say that this valley[7] extends through Arabia to the Red Sea,[8] and that many profess to have visited it,[9] and that it is in the lowest part of it that the date-palms grow. Now both accounts may be true, for it is not strange that

[5] *ὀρθοφυῆ τ' ἢ* conj. W.; *ὀρθοφύηται* P_2Ald.
[6] *ἀπαρτῶνται* conj. R. Const.; *ἀπορθῶνται* P_2MAld.
[7] *cf.* Diod. 3. 41.
[8] *i.e.* the Arabian Gulf.
[9] *ἐληλυθέναι* Ald.; *διεληλυθέναι* conj. W.

αὐτὰ τὰ δένδρα, διαφέρειν καὶ τὰς ἐργασίας οὐκ ἄτοπον.

6 Γένη δὲ τῶν φοινίκων ἐστὶ πλείω· πρῶτον μὲν καὶ ὥσπερ ἐν μεγίστῃ διαφορᾷ τὸ μὲν κάρπιμον τὸ δὲ ἄκαρπον, ἐξ ὧν οἱ περὶ Βαβυλῶνα τάς τε κλίνας καὶ τἆλλα σκεύη ποιοῦνται. ἔπειτα τῶν καρπίμων οἱ μὲν ἄρρενες αἱ δὲ θήλειαι· διαφέρουσι δὲ ἀλλήλων, καθ' ἃ ὁ μὲν ἄρρην ἄνθος πρῶτον φέρει ἐπὶ τῆς σπάθης, ἡ δὲ θήλεια καρπὸν εὐθὺ μικρόν. αὐτῶν δὲ τῶν καρπῶν διαφοραὶ πλείους· οἱ μὲν γὰρ ἀπύρηνοι οἱ δὲ μαλακοπύρηνοι· τὰς χροιὰς οἱ μὲν λευκοὶ οἱ δὲ μέλανες οἱ δὲ ξανθοί· τὸ δ' ὅλον οὐκ ἐλάττω χρώματά φασιν εἶναι τῶν συκῶν οὐδ' ἁπλῶς τὰ γένη· διαφέρειν δὲ καὶ κατὰ τὰ μεγέθη καὶ κατὰ τὰ σχήματα· καὶ γὰρ σφαιροειδεῖς ἐνίους ὡσανεὶ μῆλα καὶ τὰ μεγέθη τηλικούτους ὡς τέτταρας εἰς τὸν πῆχυν εἶναι, [ἕπτα καὶ εὐπόδους]· ἄλλους δὲ μικροὺς ἡλίκους ἐρεβίνθους. καὶ τοῖς χυλοῖς δὲ πολὺ διαφέροντας.

7 Κράτιστον δὲ καὶ τῶν λευκῶν καὶ τῶν μελάνων τὸ βασιλικὸν καλούμενον γένος ἐν ἑκατέρῳ καὶ μεγέθει καὶ ἀρετῇ· σπάνια δ' εἶναι ταῦτα λέγουσι· σχεδὸν γὰρ ἐν μόνῳ τῷ Βαγῴου κήπῳ τοῦ παλαιοῦ περὶ Βαβυλῶνα. ἐν Κύπρῳ δὲ ἴδιόν τι γένος φοινίκων ἐστὶν ὃ οὐ πεπαίνει τὸν καρπόν, ἀλλ' ὠμὸς ὢν ἡδὺς σφόδρα καὶ γλυκύς ἐστι· τὴν δὲ γλυκύτητα ἰδίαν ἔχει. ἔνιοι δ' οὐ μόνον δια-

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[1] Plin. 13. 39.

[2] πρῶτον conj. Sch.; πρῶτος UMVAld.

[3] πῆχυν conj. R. Const. from Plin. 13. 45. and G, *cf.* Diod. 2. 53; στάχυν UMVAld.

[4] ἕπτα καὶ εὐπόδους UMV: the words perhaps conceal a

in different soils the methods of cultivation should differ, like the trees themselves.

[1] There are several kinds of palm. To begin with, to take first the most important difference;—some are fruitful and some not; and it is from this latter kind that the people of Babylon make their beds and other furniture. Again of the fruitful trees some are 'male,' others 'female'; and these differ from one another in that the 'male' first[2] bears a flower on the spathe, while the 'female' at once bears a small fruit. Again there are various differences in the fruits themselves; some have no stones, others soft stones; as to colour, some are white, some black, some yellow; and in general they say that there is not less variety of colour and even of kind than in figs; also that they differ in size and shape, some being round like apples and of such a size that four of them make up a cubit[3] in length, . . .[4] while others are small,[5] no bigger than chick-peas; and that there is also much difference in flavour.

The best kind alike in size and in quality, whether of the white or black variety, is that which in either form is called 'the royal palm'; but this, they say, is rare; it grows hardly anywhere except in the park of the ancient Bagoas,[6] near Babylon. In Cyprus[7] there is a peculiar kind of palm which does not ripen its fruit, though, when it is unripe, it is very sweet and luscious, and this lusciousness is of a peculiar kind. Some palms again[8] differ not merely

gloss on πῆχυν, *e.g.* εἰς πῆχυς δύο πόδες (Salm.); om. G; ἐνίοτε καὶ ἐπὶ πόδα conj. W. [5] Plin. 13. 42.

[6] Βαγῴου: Βάττου MSS. corr. by R. Const. from Plin. 13. 41. τοῦ παλαίου apparently distinguishes this Bagoas from some more recent wearer of the name.

[7] Plin. 13. 33. [8] Plin. 13. 28.

φέρουσι τοῖς καρποῖς ἀλλὰ καὶ αὐτῷ τῷ δένδρῳ κατά τε τὸ μῆκος καὶ τὴν ἄλλην μορφήν· οὐ γὰρ μεγάλοι καὶ μακροὶ ἀλλὰ βραχεῖς, ἔτι δὲ καρπιμώτεροι τῶν ἄλλων καὶ καρποφοροῦντες εὐθὺς τριετεῖς· πολλοὶ δὲ καὶ οὗτοι περὶ Κύπρον. εἰσὶ δὲ καὶ περὶ Συρίαν καὶ περὶ Αἴγυπτον φοίνικες οἳ φέρουσι τετραετεῖς καὶ πενταετεῖς ἀνδρομήκεις ὄντες.

8 Ἕτερον δ' ἔτι γένος ἐν Κύπρῳ, ὃ καὶ τὸ φύλλον πλατύτερον ἔχει καὶ τὸν καρπὸν μείζω πολλῷ καὶ ἰδιόμορφον· μεγέθει μὲν ἡλίκος ῥόα τῷ σχήματι δὲ προμήκης, οὐκ εὔχυλος δὲ ὥσπερ ἄλλοι ἀλλ' ὅμοιος ταῖς ῥόαις, ὥστε μὴ καταδέχεσθαι ἀλλὰ διαμασησαμένους ἐκβάλλειν. γένη μὲν οὖν, ὥσπερ εἴρηται, πολλά. θησαυρίζεσθαι δὲ μόνους δύνασθαί φασι τῶν ἐν Συρίᾳ τοὺς ἐν τῷ αὐλῶνι, τοὺς δ' ἐν Αἰγύπτῳ καὶ Κύπρῳ καὶ παρὰ τοῖς ἄλλοις χλωροὺς ἀναλίσκεσθαι.

9 Ἔστι δὲ ὁ φοῖνιξ ὡς μὲν ἁπλῶς εἰπεῖν μονοστέλεχες καὶ μονοφυές· οὐ μὴν ἀλλὰ γίνονταί τινες καὶ διφυεῖς, ὥσπερ ἐν Αἰγύπτῳ, καθάπερ δικρόαν ἔχοντες· τὸ δ' ἀνάστημα τοῦ στελέχους ἀφ' οὗ ἡ σχίσις καὶ πεντάπηχυ· πρὸς ἄλληλα δέ πως ἰσάζοντα. φασὶ δὲ καὶ τοὺς ἐν Κρήτῃ πλείους εἶναι τοὺς διφυεῖς, ἐνίους δὲ καὶ τριφυεῖς· ἐν δὲ τῇ Λαπαίᾳ τινὰ καὶ πεντακέφαλον· οὐκ ἄλογον γοῦν ἐν ταῖς εὐτροφωτέραις χώραις πλείω γίνεσθαι τὰ τοιαῦτα καὶ τὸ ὅλον δὲ τὰ εἴδη πλείω καὶ τὰς διαφοράς.

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[1] *ὅμοιος* conj. Bod.; *ὁμοίως* UMVAld. [2] *cf.* § 5.

[3] Plin. 13. 38; *cf.* 4. 2. 7, where the name (*κουκιόφορον*) of this tree is given.

in their fruits but in the character of the tree itself as to stature and general shape; for instead of being large and tall they are low growing; but these are more fruitful than the others, and they begin to bear as soon as they are three years old; this kind too is common in Cyprus. Again in Syria and Egypt there are palms which bear when they are four or five years old, at which age they are the height of a man.

There is yet another kind in Cyprus, which has broader leaves and a much larger fruit of peculiar shape; in size it is as large as a pomegranate, in shape it is long; it is not however juicy like others, but like[1] a pomegranate, so that men do not swallow it, but chew it and then spit it out. Thus, as has been said, there are many kinds. The only dates that will keep, they say, are those which grow in the Valley[2] of Syria, while those that grow in Egypt Cyprus and elsewhere are used when fresh.

The palm, speaking generally, has a single and simple stem; however there are some with two stems, as in Egypt,[3] which make a fork, as it were; the length of the stem up to the point where it divides is as much as five cubits, and the two branches of the fork are about equal in length. They say that the palms in Crete more often than not have this double stem, and that some of them have three stems; and that in Lapaia one with five heads has been known. It is after all not surprising[4] that in more fertile soils such instances should be commoner, and in general that more kinds and more variation should be found under such conditions.

[4] *οὐκ ἄλογον γοῦν* conj. W. (*οὐκ ἄλογον δ'* Sch.); *οὐ καλῶς γοῦν* Ald. MU (marked doubtful).

10 Ἄλλο δέ τι γένος ἐστὶν ὃ φασι γίνεσθαι πλεῖστον περὶ τὴν Αἰθιοπίαν, ὃ καλοῦσι κόϊκας· οὗτοι δὲ θαμνώδεις, οὐχὶ ἓν τὸ στέλεχος ἔχοντες ἀλλὰ πλείω καὶ ἐνίοτε συνηρτημένα μέχρι τινὸς εἰς ἕν, τὰς δὲ ῥάβδους οὐ μακρὰς μὲν ἀλλ' ὅσον πηχυαίας, ἀλλὰ λείας, ἐπὶ δὲ τῶν ἄκρων τὴν κόμην. ἔχουσι δὲ καὶ τὸ φύλλον πλατὺ καὶ ὥσπερ ἐκ δυοῖν συγκείμενον ἐλαχίστοιν. καλοὶ δὲ καὶ τῇ ὄψει φαίνονται· τὸν δὲ καρπὸν καὶ τῷ σχήματι καὶ τῷ μεγέθει καὶ τῷ χυλῷ διάφορον ἔχουσι· στρογγυλώτερον γὰρ καὶ μείζω καὶ εὐστομώτερον ἧττον δὲ γλυκύν. πεπαίνουσι δὲ ἐν τρισὶν ἔτεσιν ὥστ' ἀεὶ καρπὸν ἔχειν, ἐπικαταλαμβάνοντος τοῦ νέου τὸν ἔνον· ποιοῦσι δὲ καὶ ἄρτους ἐξ αὐτῶν· περὶ μὲν οὖν τούτων ἐπισκεπτέον.

11 Οἱ δὲ χαμαιρριφεῖς καλούμενοι τῶν φοινίκων ἕτερόν τι γένος ἐστὶν ὥσπερ ὁμώνυμον· καὶ γὰρ ἐξαιρεθέντος τοῦ ἐγκεφάλου ζῶσι καὶ κοπέντες ἀπὸ τῶν ῥιζῶν παραβλαστάνουσι. διαφέρουσι δὲ καὶ τῷ καρπῷ καὶ τοῖς φύλλοις· πλατὺ γὰρ καὶ μαλακὸν ἔχουσι τὸ φύλλον, δι' ὃ καὶ πλέκουσιν ἐξ αὐτοῦ τάς τε σπυρίδας καὶ τοὺς φορμούς· πολλοὶ δὲ καὶ ἐν τῇ Κρήτῃ γίνονται καὶ ἔτι μᾶλλον ἐν Σικελίᾳ. ταῦτα μὲν οὖν ἐπὶ πλεῖον εἴρηται τῆς ὑποθέσεως.

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[1] Plin. 13. 47.

[2] *κόϊκας* conj. Salm. *cf.* 1. 10. 5, and the probable reading in Plin. *l.c.*

[3] *συνηρτημένα μέχρι τινὸς εἰς ἕν* conj. W.; *συνηρτημένας μὲν*

[1] There is another kind which is said to be abundant in Ethiopia, called the doum-palm[2]; this is a shrubby tree, not having a single stem but several, which sometimes are joined together up to a certain point[3]; and the leaf-stalks are not long,[4] only the length of a cubit, but they are plain,[5] and the leafage is borne only at the tip. The leaf is broad and, as it were, made up of at least[6] two leaflets. This tree is fair to look upon, and its fruit in shape size and flavour differs from the date, being rounder larger and pleasanter to the taste, though not so luscious. It ripens in three years, so that there is always fruit on the tree, as the new fruit overtakes that of last year. And they make bread out of it. These reports then call for enquiry.

[7] The dwarf-palm, as it is called, is a distinct kind, having nothing but its name[8] in common with other palms. For if the head is removed, it survives, and, if it is cut down, it shoots again from the roots. It differs too in the fruit and leaves; for the leaf is broad and flexible, and so they weave their baskets and mats out of it. It is common in Crete and still more so in Sicily.[9] However in these matters we have said more than our purpose required.

εἰς ἓν U; *συνηρτημένα μέχρι τινός εἰσι* Ald.; *συνηρτημέναι μὲν μέχρι τινὸς εἶεν* MV.

[4] *μὲν* ins. W. after Sch. (omitted above).

[5] *i.e.* without leaflets, except at the tip.

[6] *ἐλαχίστοιν* Bas.; *ἐλαχίστων* U. *cf.* Arist. *Eth. N.* 5. 3. 3, *ἐν ἐλαχίστοις δυσίν.*

[7] Plin. 13. 39. [8] For *δμώνυμον cf.* 9. 10. 1 n.

[9] A dwarf palm is now abundant at Selinunte: *cf.* Verg. *Aen.* 3. 705, *palmosa Selinus.*

12 Ἐν δὲ ταῖς τῶν ἄλλων φυτείαις ἀνάπαλιν τίθενται τὰ φυτευτήρια, καθάπερ τῶν κλημάτων. οἱ μὲν οὖν οὐθὲν διαφέρειν φασὶν ἥκιστα δὲ ἐπὶ τῶν ἀμπέλων· ἔνιοι δὲ ῥόαν δασύνεσθαι καὶ σκιάζειν μᾶλλον τὸν καρπόν· ἔτι δὲ ἧττον ἀποβάλλειν τοὺς κυτίνους. συμβαίνειν δὲ τοῦτό φασι καὶ ἐπὶ τῆς συκῆς· οὐ γὰρ ἀποβάλλειν ἀνάπαλιν φυτευθεῖσαν, ἔτι δ' εὐβατωτέραν γίνεσθαι· οὐκ ἀποβάλλειν δὲ οὐδ' ἐάν τις ἀποκλάσῃ φυομένης εὐθὺς τὸ ἄκρον.

Αἱ μὲν οὖν φυτεῖαι καὶ γενέσεις ὃν τρόπον ἔχουσι σχεδὸν ὡς τύπῳ περιλαβεῖν εἴρηνται.

VII. Περὶ δὲ τῆς ἐργασίας καὶ τῆς θεραπείας τὰ μέν ἐστι κοινὰ τὰ δὲ ἴδια καθ' ἕκαστον. κοινὰ μὲν ἥ τε σκαπάνη καὶ ἡ ὑδρεία καὶ ἡ κόπρωσις, ἔτι δὲ ἡ διακάθαρσις καὶ ἀφαίρεσις τῶν αὔων. διαφέρουσι δὲ τῷ μᾶλλον καὶ ἧττον. τὰ μὲν φίλυδρα καὶ φιλόκοπρα τὰ δ' οὐχ ὁμοίως, οἷον ἡ κυπάριττος, ἥπερ οὐ φιλόκοπρον οὐδὲ φίλυδρον, ἀλλὰ καὶ ἀπόλλυσθαί φασιν ἐάν γε νέαν οὖσαν ἐφυδρεύωσι πολλῷ. ῥόα δὲ καὶ ἄμπελος φίλυδρα. συκῆ δὲ εὐβλαστοτέρα μὲν ὑδρευομένη τὸν δὲ καρπὸν ἴσχει χείρω πλὴν τῆς Λακωνικῆς· αὕτη δὲ φίλυδρος.

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[1] ἀνάπαλιν conj. Sch.; τἀνάπαλιν Ald. *cf. C.P.* 2. 9. 4; *Geop.* 10. 45; Plin. 17. 84. [2] οὖν ins. H.

[3] δασύνεσθαι: see LS. reff. *s.v.* δασύς.

[4] *cf. C.P.* 2. 9. 3.

[5] εὐβατωτέραν (*i.e.* 'more manageable'). The reference is to a method of keeping the tree dwarf (Bod.). Plin. *l.c.* has

Further notes on the propagation of trees.

To return to the other trees :—in propagating them they set the cuttings upside down,[1] as with vine-shoots. Some however[2] say that that makes no difference, and least of all in propagating the vine ; while others contend that the pomegranate thus propagated has a bushier growth[3] and shades the fruit better, and also that it is then[4] less apt to shed the flower. This also occurs, they say, with the fig ; when it is set upside down, it does not shed its fruit, and it makes a more accessible[5] tree ; and it does not shed its fruit, even if one breaks off the top[6] as it begins to grow.

Thus we have given a general sketch of what we find about methods of propagation, and of the ways in which these trees are reproduced.

Of the cultivation of trees.

VII.[7] As to cultivation and tendance some requirements apply equally to all trees, some are peculiar to one. Those which apply equally to all are spade-work watering and manuring, and moreover pruning and removal of dead wood. But different trees differ in the degree. Some love moisture and manure, some not so much, as the cypress,[8] which[9] is fond neither of manure nor of water, but actually dies, they say, if it is overwatered when young. But the pomegranate and vine are water-loving. The fig grows more vigorously if it is watered, but then its fruit is inferior, except in the case of the Laconian variety, which is water-loving.[10]

scansilem (so also G), which seems to be a rendering of *εὐβατ.* *εὐβατοτέραν* U.

[6] *τὸ ἄκρον* conj. R. Const. after G ; *τὸν καρπὸν* UMVP$_2$Ald.

[7] Plin. 17. 246. [8] Plin. 17. 247.

[9] *ἥπερ* conj. W. from G ; *ὥσπερ* Ald. [10] *cf. C.P.* 3. 6. 6.

2 Διακαθαίρεσθαι δὲ πάντα ζητεῖ· βελτίω γὰρ τῶν αὔων ἀφαιρουμένων ὥσπερ ἀλλοτρίων, ἃ καὶ τὰς αὐξήσεις καὶ τὰς τροφὰς ἐμποδίζει. δι' ὃ καὶ . . . ὅταν ᾖ γεράνδρυον ὅλως κόπτουσιν· ἡ γὰρ βλάστησις νέα γίνεται τοῦ δένδρου. πλείστης δὲ διακαθάρσεώς φησιν Ἀνδροτίων δεῖσθαι μύρρινον καὶ ἐλάαν· ὅσῳ γὰρ ἂν ἐλάττω καταλίπῃς, ἄμεινον βλαστήσει καὶ τὸν καρπὸν οἴσει πλείω· πλὴν ἀμπέλου δῆλον ὅτι· ταύτῃ γὰρ ἀναγκαιότερον καὶ πρὸς βλάστησιν καὶ πρὸς εὐκαρπίαν. ἁπλῶς δὲ καὶ ταύτην καὶ τὴν ἄλλην θεραπείαν πρὸς τὴν ἰδίαν φύσιν ἑκάστῳ ποιητέον.

3 Δεῖσθαι δέ φησιν Ἀνδροτίων καὶ κόπρου δριμυτάτης καὶ πλείστης ὑδρείας, ὥσπερ καὶ τῆς διακαθάρσεως, ἐλάαν καὶ μύρρινον καὶ ῥόαν· οὐ γὰρ ἔχειν μήτραν οὐδὲ νόσημα κατὰ γῆς οὐδέν· ἀλλ' ἐπειδὰν παλαιὸν ᾖ τὸ δένδρον, ἀποτέμνειν δεῖν τοὺς ἀκρεμόνας ἔπειτα τὸ στέλεχος θεραπεύειν ὡσπερὰν ἐξ ἀρχῆς φυτευθέν· οὕτω δέ φασι πολυχρονιώτερα καὶ ἰσχυρότατα μύρρινον εἶναι καὶ ἐλάαν. ταῦτα μὲν οὖν ἐπισκέψαιτ' ἄν τις, εἰ καὶ μὴ πάντα ἀλλὰ περί γε τῆς μήτρας.

4 Ἡ δὲ κόπρος οὔτε πᾶσιν ὁμοίως οὔθ' ἡ αὐτὴ πᾶσιν ἁρμόττει· τὰ μὲν γὰρ δριμείας δεῖται τὰ δ' ἧττον τὰ δὲ παντελῶς κούφης. δριμυτάτη δὲ ἡ τοῦ ἀνθρώπου· καθάπερ καὶ Χαρτόδρας ἀρίστην μὲν ταύτην εἶναί φησι, δευτέραν δὲ τὴν ὑείαν, τρίτην δὲ αἰγός, τετάρτην δὲ προβάτου,

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[1] Plin. 17. 248.
[2] Name of tree missing. Sch.
[3] *cf. C.P.* 3. 10. 4.
[4] *ταύτῃ* conj. W.; *ταύτης* Ald.

[1] All trees require pruning; for they are improved by removal of the dead wood, which is, as it were, a foreign body, and prevents growth and nourishment. Wherefore when the (tree)[2] becomes old, they cut off all its boughs: for then the tree breaks afresh. Androtion[3] says that the myrtle and olive need more pruning than any other trees; for the smaller you leave them, the better they will grow, and they will bear better fruit. But the vine of course needs pruning even more; for it is in the case of this tree[4] more necessary for promoting both growth and fruitfulness. However, speaking generally, both this and other kinds of tendance must be suited to the particular natural character in each case.

Androtion further says that the olive the myrtle and the pomegranate require the most pungent manure and the heaviest watering, as well as the most thorough pruning, for that then they do not get 'softwood'[5] nor any disease underground; but when the tree is old, he adds, one should cut off the boughs, and then attend to the stem as though it were a tree just planted. Thus[6] treated they say that the myrtle and olive are longer lived and very robust. These statements might be a subject for further enquiry, or, if not all of them, at least what is stated of the 'softwood.'

Manure does not suit all alike, nor is the same manure equally good for all. Some need it pungent, some less so, some need it quite light. The most pungent is human dung: thus Chartodras[7] says that this is the best, pig-manure being second to it, goat-manure third, fourth that of sheep, fifth that of

[5] *i.e.* effete sap-wood. [6] *οὕτω* conj. W.; *οἱ* Ald.
[7] Name perhaps corrupt.

πέμπτην δὲ βοός, ἕκτην δὲ τὴν λοφούρων. ἡ δὲ συρματῖτις ἄλλη καὶ ἄλλως· ἡ μὲν γὰρ ἀσθενεστέρα ταύτης ἡ δὲ κρείττων.

5 Τὴν δὲ σκαπάνην πᾶσιν οἴονται συμφέρειν, ὥσπερ καὶ τὴν ὄσκαλσιν τοῖς ἐλάττοσιν· εὐτραφέστερα γὰρ γίνεσθαι. τρέφειν δὲ δοκεῖ καὶ ὁ κονιορτὸς ἔνια καὶ θάλλειν ποιεῖν, οἷον τὸν βότρυν, δι' ὃ καὶ ὑποκονίουσι πολλάκις· οἱ δὲ καὶ τὰς συκᾶς ὑποσκάπτουσιν ἔνθα τούτου δεῖ. Μεγαροῖ δὲ καὶ τοὺς σικύους καὶ τὰς κολοκύντας, ὅταν οἱ ἐτησίαι πνεύσωσι, σκάλλοντες κονιορτοῦσι καὶ οὕτω γλυκυτέρους καὶ ἁπαλωτέρους ποιοῦσιν οὐχ ὑδρεύοντες. τοῦτο μὲν οὖν ὁμολογούμενον. τὴν δ' ἄμπελον οὔ φασί τινες δεῖν [ἢ] ὑποκονίειν οὐδ' ὅλως ἅπτεσθαι περκάζοντος τοῦ βότρυος, ἀλλ' εἴπερ ὅταν ἀπομελανθῇ. οἱ δὲ τὸ ὅλον μηδὲ τότε πλὴν ὅσον ὑποτῖλαι τὴν βοτάνην· ὑπὲρ μὲν οὖν τούτων ἀμφισβητοῦσιν.

6 Ἐὰν δέ τι μὴ φέρῃ καρπὸν ἀλλ' εἰς βλάστησιν τρέπηται, σχίζουσι τοῦ στελέχους τὸ κατὰ γῆν καὶ λίθον ἐντιθέασιν ὅπως ἂν ῥαγῇ, καί φασι φέρειν. ὁμοίως δὲ καὶ ἐάν τις τῶν ῥιζῶν τινας περιτέμῃ, δι' ὃ καὶ τῶν ἀμπέλων ὅταν τραγῶσι τοῦτο ποιοῦσι τὰς ἐπιπολῆς. τῶν δὲ συκῶν πρὸς τῷ περιτέμνειν καὶ τέφραν περιπάττουσι καὶ κατασχάζουσι τὰ στελέχη καί φασι φέρειν μᾶλλον. ἀμυγδαλῇ δὲ καὶ πάτταλον ἐγκόψαντες

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[1] Lit. 'bushy tails,' *i.e.* horses asses mules.

[2] *cf. C.P.* 3. 16. 3. [3] δεῖ ins. H ; so apparently G read.

[4] δεῖν ὑποκονίειν οὐδ' ὅλως conj. W. (so Sch., but keeping [ἢ] after δεῖν); δεῖν ἢ ὑποκινιεῖν οὐδ' ὅλως UMV; δεῖν ἢ ὑποκονιεῖν ἢ ὅλως Ald. [5] Plin. 17. 253 and 254.

oxen, and sixth that of beasts of burden.[1] Litter manure is of different kinds and is applied in various ways: some kinds are weaker, some stronger.

Spade-work is held to be beneficial to all trees, and also hoeing for the smaller ones, as they then become more vigorous. Even dust[2] is thought to fertilise some things and make them flourish, for instance the grape; wherefore they often put dust to the roots of the vine. Some also dig in dust about the figs in places where it is deficient.[3] In Megara, when the etesian winds are past, they cover the cucumber and gourd plants with dust by raking, and so make the fruits sweeter and tenderer by not watering. On this point there is general agreement. But some say that dust should not be put to the vine,[4] and that it should not be meddled with at all when the grape is turning, or, if at all, only when it has turned black. Some again say that even then nothing should be done except to pluck up the weeds. So on this point there is a difference of opinion.

[5] If a tree does not bear fruit but inclines to a leafy growth, they split that part of the stem which is underground and insert a stone corresponding[6] to the crack thus made, and then, they say, it will bear. The same result follows, if one cuts off some of the roots, and accordingly they thus treat the surface roots of the vine when it runs to leaf. In the case of figs, in addition to root-pruning,[7] they also sprinkle ashes about the tree, and make gashes in the stems, and then, they say, it bears better. [8] Into the almond tree they drive an iron peg, and, having thus made

[6] ὅπως ἂν ῥαγῇ Ald.: so G; ? ὅπου; ὅπως ἀνεάγῃ conj. W. *cf. Geop.* 5. 35. [7] Plin. *l.c.*

[8] *cf.* 2. 2. 11; *C.P.* 1. 17. 10; 2. 14. 1; Plin. 7. 253.

σιδηροῦν ὅταν τετράνωσιν ἄλλον ἀντεμβάλλουσι δρύϊνον καὶ τῇ γῇ κρύπτουσιν· ὃ καὶ καλοῦσί τινες κολάζειν ὡς ὑβρίζον τὸ δένδρον.

Ταὐτὸν δὲ τοῦτο καὶ ἐπὶ τῆς ἀπίου καὶ ἐπ' ἄλλων τινὲς ποιοῦσιν. ἐν Ἀρκαδίᾳ δὲ καὶ εὐθύνειν καλοῦσι τὴν ὄαν· πολὺ γὰρ τὸ δένδρον τοῦτο παρ' αὐτοῖς ἐστι. καί φασιν, ὅταν πάθῃ τοῦτο, τὰς μὲν μὴ φερούσας φέρειν τὰς δὲ μὴ πεττούσας ἐκπέττειν καλῶς. ἀμυγδαλῆν δὲ καὶ ἐκ πικρᾶς γίγνεσθαι γλυκεῖαν, ἐάν τις περιορύξας τὸ στέλεχος καὶ τιτράνας ὅσον τε παλαιστιαῖον τὸ πανταχόθεν ἀπορρέον δάκρυον ἐπὶ ταὐτὸ ἐᾷ καταρρεῖν. τοῦτο μὲν οὖν ἂν εἴη πρός τε τὸ φέρειν ἅμα καὶ πρὸς τὸ εὐκαρπεῖν.

VIII. Ἀποβάλλει δὲ πρὸ τοῦ πέψαι τὸν καρπὸν ἀμυγδαλῆ μηλέα ῥόα ἄπιος καὶ μάλιστα δὴ πάντων συκῆ καὶ φοῖνιξ, πρὸς ἃ καὶ τὰς βοηθείας ζητοῦσι· ὅθεν καὶ ὁ ἐρινασμός· ἐκ γὰρ τῶν ἐκεῖ κρεμαννυμένων ἐρινῶν ψῆνες ἐκδυόμενοι κατεσθίουσι καὶ παιίνουσι τὰς κορυφάς. διαφέρουσι δὲ καὶ αἱ χῶραι πρὸς τὰς ἀποβολάς· περὶ γὰρ Ἰταλίαν οὔ φασιν ἀποβάλλειν, δι' ὃ οὐδ' ἐρι-

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[1] The operation being performed at the base of the tree. *cf.* § 7. [2] *ἐκπέττειν* conj. R. Const.; *εἰσπέττειν* UMAld.

[3] Plin. 17. 252.

[4] *τὸ παντάχοθεν* conj. W.; *παντάχοθεν τὸ* MSS.; so apparently G. *cf. C.P.* 2. 14. 4.

[5] *πέψαι* conj. Sch.; *πέμψαι* Ald.

[6] *ἐκεῖ κρεμαννυμένων ἐρινῶν* I conj.; *ἐκεῖ κρεμαννυμένων* Ald.; *ἐπικρεμαμένων ἐρινῶν* conj. W.: but the present partic. is used *C.P.* 2. 9. 5.

a hole, insert in its place a peg of oak-wood and bury it[1] in the earth, and some call this 'punishing' the tree, since its luxuriance is thus chastened.

Some do the same with the pear and with other trees. In Arcadia they have a similar process which is called 'correcting' the sorb (for that tree is common in that country). And they say that under this treatment those trees that would not bear do so, and those that would not ripen their fruit now ripen[2] them well. [3] It is also said that the almond becomes sweet, instead of bitter, if one digs round the stem and, having bored a hole about a palms-breadth, allows the gum which exudes from all sides [4] to flow down into it and collect. The object of this would be alike to make the tree bear and to improve the fruit.

Of remedies for the shedding of the fruit: caprification.

VIII. Trees which are apt to shed their fruit before ripening[5] it are almond apple pomegranate pear and, above all, fig and date-palm; and men try to find the suitable remedies for this. This is the reason for the process called 'caprification'; gall-insects come out of the wild figs which are hanging there,[6] eat the tops of the cultivated figs and so make them swell.[7] The shedding of the fruit differs according to the soil: in Italy[8] they say that it does not occur, and so they do not use caprification,[9]

[7] *πιαίνουσι* MV Ald.; *διείρουσι* conj. W. ? *πεπαίνουσι*, 'ripen,' which is the word used in the parallel pass. *C.P.* 2. 9. 6, the object of the process being to cause the figs to dry.

[8] Plin. 15. 81. 'Italy' means South Italy. *cf.* 4. 5. 5 and 6; 5. 8. 1.

[9] *ἐρινάζουσιν* conj. Bod.; *ἐρινοῦσιν* Ald. H.

νάζουσιν· οὐδ' ἐν τοῖς καταβορείοις καὶ λεπτογείοις, οἷον ἐπὶ Φαλύκῳ τῆς Μεγαρίδος· οὐδὲ τῆς Κορινθίας ἔν τισι τόποις. ὡσαύτως δὲ καὶ ἡ τῶν πνευμάτων κατάστασις· βορείοις γὰρ μᾶλλον ἢ νοτίοις ἀποβάλλουσι, κἂν ψυχρότερα καὶ πλείω γένηται μᾶλλον· ἔτι δ' αὐτῶν τῶν δένδρων ἡ φύσις· τὰ πρώϊα γὰρ ἀποβάλλει, τὰ δ' ὄψια οὐκ ἐκβάλλει, καθάπερ ἡ Λακωνικὴ καὶ αἱ ἄλλαι. δι' ὃ καὶ οὐκ ἐρινάζουσι ταύτας. ταῦτα μὲν οὖν ἔν τε τοῖς τόποις καὶ τοῖς γένεσι καὶ τῇ καταστάσει τοῦ ἀέρος ἔχει τὰς διαφοράς.

2 Οἱ δὲ ψῆνες ἐκδύονται μὲν ἐκ τοῦ ἐρινεοῦ, καθάπερ εἴρηται· γίνονται δ' ἐκ τῶν κεγχραμίδων. σημεῖον δὲ λέγουσιν, ὅτι ἐπειδὰν ἐκδύωσιν οὐκ ἔνεισι κεγχραμίδες. ἐκδύονται δὲ οἱ πολλοὶ ἐγκαταλιπόντες ἢ πόδα ἢ πτερόν. γένος δέ τι καὶ ἕτερόν ἐστι τῶν ψηνῶν, ὃ καλοῦσι κεντρίνας· οὗτοι δ' ἀργοὶ καθάπερ κηφῆνες· καὶ τοὺς εἰσδυομένους τῶν ἑτέρων κτείνουσιν αὐτοὶ δὲ ἐναποθνήσκουσιν. ἐπαινοῦσι δὲ μάλιστα τῶν ἐρινῶν τὰ μέλανα τὰ ἐκ τῶν πετρωδῶν χωρίων· πολλὰς
3 γὰρ ἔχει ταῦτα κεγχραμίδας. γιγνώσκεται δὲ τὸ ἐρινασμένον τῷ ἐρυθρὸν εἶναι καὶ ποικίλον καὶ ἰσχυρόν· τὸ δ' ἀνερίναστον λευκὸν καὶ ἀσθενές· προστιθέασι δὲ τοῖς δεομένοις ὅταν ὕσῃ. ὅπου δὲ πλεῖστος κονιορτός, ἐνταῦθα πλεῖστα καὶ

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[1] *cf.* 8. 2. 11.

[2] ψυχρότερα καὶ πλείω conj. Sch.; τεχνοτέρα καὶ πλείων MV Ald.; τεχρότερα καὶ πλείω U.

[3] πρωΐα conj. Sch. from G; πρῶτα Ald.H.

[4] Plin. 17. 255 and 256.

nor is it practised in places which face north nor in those with light soils, as at Phalykos[1] in the Megarid, nor in certain parts of the district of Corinth. Also conditions as to wind make a difference; the fruit is shed more with northerly than with southerly winds, and this also happens more if the winds are cold and frequent.[2] Moreover the character of the tree itself makes a difference; for some kinds, such as the Laconian and other such kinds, shed their early[3] figs but not the later ones. Wherefore caprification is not practised with these. Such are the changes to which the fig is subject in respect of locality kind and climatic conditions.

[4] Now the gall-insects come, as has been said, out of the wild fig, and they are engendered from the seeds. The proof given of this is that, when they come out, there are no seeds left in the fruit; and most of them in coming out leave a leg or a wing behind. There is another kind of gall-insect which is called *kentrines*; these insects are sluggish, like drones, they kill those of the other kind who are entering the figs, and they themselves die in the fruit. The black kind of wild fig which grows in rocky places is most commended for caprification, as these figs contain numerous seeds.[5] A fig which has been subject to caprification is known by being red and parti-coloured and stout, while one which has not been so treated is pale and sickly. The treatment is applied to the trees which need it, after rain. The wild figs are most plentiful and most potent

[5] *i.e.* and so should produce more gall-insects: in *C.P.* ii. 9. 6 it is implied that the insect is produced by putrefaction of the seeds of the wild fig.

ἰσχυρότατα τὰ ἐρινὰ γίνεται. φασὶ δὲ ἐρινάζειν καὶ τὸ πόλιον, ὁπόταν αὐτῷ καρπὸς ᾖ πολύς, καὶ τοὺς τῆς πτελέας κωρύκους· ἐγγίνεται γὰρ καὶ ἐν τούτοις θηρίδι' ἄττα. κνῖπες ὅταν ἐν ταῖς συκαῖς γίνωνται κατεσθίουσι τοὺς ψῆνας. ἄκος δὲ τούτου φασὶν εἶναι τοὺς καρκίνους προσπερονᾶν· πρὸς γὰρ τούτους τρέπεσθαι τοὺς κνῖπας. ἀλλὰ γὰρ δὴ ταῖς μὲν συκαῖς αὗται βοήθειαι.

4 Τοῖς δὲ φοίνιξιν αἱ ἀπὸ τῶν ἀρρένων πρὸς τοὺς θήλεις· οὗτοι γάρ εἰσιν οἱ ἐπιμένειν ποιοῦντες καὶ ἐκπέττειν, ὃ καλοῦσί τινες ἐκ τῆς ὁμοιότητος ὀλυνθάζειν. γίνεται δὲ τόνδε τὸν τρόπον. ὅταν ἀνθῇ τὸ ἄρρεν, ἀποτέμνουσι τὴν σπάθην ἐφ' ἧς τὸ ἄνθος εὐθὺς ὥσπερ ἔχει, τόν τε χνοῦν καὶ τὸ ἄνθος καὶ τὸν κονιορτὸν κατασείουσι κατὰ τοῦ καρποῦ τῆς θηλείας· κἂν τοῦτο πάθῃ, διατηρεῖ καὶ οὐκ ἀποβάλλει. φαίνεται δ' ἀμφοῖν ἀπὸ τοῦ ἄρρενος τοῖς θήλεσι βοήθεια γίνεσθαι· θῆλυ γὰρ καλοῦσι τὸ καρποφόρον· ἀλλ' ἡ μὲν οἷον μῖξις· ἡ δὲ κατ' ἄλλον τρόπον.

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[1] *ὁπότ' ἂν . . . πολύς* conj. W. from G, *cum copiose fructificat*; *ὁπόταν αἰγίπυρος ᾖ πολύς* MSS. U adds *καὶ* before *ὁπόταν*.

[2] *κωρύκους* I conj. In 3. 14. 1. the elm is said to bear *κωρυκίδες* which contain gnat-like creatures; these growths are called *κωρυκώδη τινα κοῖλα* 3. 15. 4; and in 3. 7. 3. the

where there is most dust. And they say that hulwort also, when it fruits freely,[1] and the 'gall-bags'[2] of the elm are used for caprification. For certain little creatures are engendered in these also. When the *knips* is found in figs, it eats the gall-insects. It is to prevent this, it is said, that they nail up the crabs; for the *knips* then turns its attention to these. Such are the ways of assisting the fig-trees.

With dates it is helpful to bring the male to the female; for it is the male which causes the fruit to persist and ripen, and this process some call, by analogy, 'the use of the wild fruit.'[3] The process is thus performed: when the male palm is in flower, they at once cut off the spathe on which the flower is, just as it is, and shake the bloom with the flower and the dust over the fruit of the female, and, if this is done to it, it retains the fruit and does not shed it. In the case both of the fig and of the date it appears that the 'male' renders aid to the 'female,' —for the fruit-bearing tree is called 'female'— but while in the latter case there is a union of the two sexes, in the former the result is brought about somewhat differently.

same thing is referred to as *τὸ θυλακῶδες τοῦτο*, where *τοῦτο* = 'the well-known'; *cf.* also 9. 1. 2, where Sch. restores *κωρύκους*; *cf.* Pall. 4. 10. 28. *κυπαίρους* (?) U; *κυπέρους* MV; *κύπειρον* Ald.; *κυττάρους* conj. W.

[3] *ὀλυνθάζειν*, from *ὄλυνθος*, a kind of wild fig, as *ἐρινάζειν*, from *ἐρινός*, the wild fig used for caprification. *cf. C.P.* 3. 18. 1.

BOOK III

Γ

1. Ἐπεὶ δὲ περὶ τῶν ἡμέρων δένδρων εἴρηται, λεκτέον ὁμοίως καὶ περὶ τῶν ἀγρίων, εἴ τέ τι ταὐτὸν καὶ ἕτερον ἔχουσι τοῖς ἡμέροις εἴ θ' ὅλως ἴδιον τῆς φύσεως.

Αἱ μὲν οὖν γενέσεις ἁπλαῖ τινες αὐτῶν εἰσι· πάντα γὰρ ἢ ἀπὸ σπέρματος ἢ ἀπὸ ῥίζης φύεται. τοῦτο δ' οὐχ ὡς οὐκ ἐνδεχόμενον καὶ ἄλλως, ἀλλ' ἴσως διὰ τὸ μὴ πειρᾶσθαι μηδένα μηδὲ φυτεύειν· ἐκφύοιτο[1] δ' ἂν εἰ λαμβάνοιεν τόπους ἐπιτηδείους καὶ θεραπείαν τὴν ἁρμόττουσαν· ὥσπερ καὶ νῦν τὰ ἀλσώδη καὶ φίλυδρα, λέγω δ' οἷον πλάτανον ἰτέαν λεύκην αἴγειρον πτελέαν· ἅπαντα γὰρ ταῦτα καὶ τὰ τοιαῦτα φυτευόμενα βλαστάνει καὶ τάχιστα καὶ κάλλιστα ἀπὸ τῶν παρασπάδων, ὥστε καὶ μεγάλας οὔσας ἤδη καὶ ἰσοδένδρους ἄν τις μεταθῇ διαμένειν· φυτεύεται δὲ τὰ πολλὰ αὐτῶν καὶ καταπηγνύμενα, καθάπερ ἡ λεύκη καὶ ἡ αἴγειρος.

2 Τούτων μὲν οὖν πρὸς τῇ σπερματικῇ καὶ τῇ ἀπὸ τῶν ῥιζῶν καὶ αὕτη γένεσίς ἐστι· τῶν δὲ

[1] ἐκφύοιτο conj. W.; ἐπιφύοιτο UMVAld.

BOOK III

Of Wild Trees.

Of the ways in which wild trees originate.

I. Now that we have spoken of cultivated trees, we must in like manner speak of wild ones, noting in what respects they agree with or differ from cultivated trees, and whether in any respects their character is altogether peculiar to themselves.

Now the ways in which they come into being are fairly simple; they all grow either from seed or from a root. But the reason of this is not that they could not possibly grow in any other way, but merely perhaps that no one even tries to plant them otherwise; whereas they might grow[1] from slips, if they were provided with a suitable position and received the fitting kind of tendance, as may be said even now of the trees of woodland and marsh, such as plane willow abele black poplar and elm; all these and other similar trees grow very quickly and well when they are planted from pieces torn off, so that[2] they survive, even if at the time of shifting they are already tall and as big as trees. Most of these are simply planted by being set firmly, for instance, the abele and the black poplar.

Such is the way in which these originate as well as from seed or from roots; the others grow only

[2] ὥστε καὶ μεγ. conj. Sch.; καὶ ὥστε καὶ μεγ. UM; καὶ ὥστε μεγ. PAld.

ἄλλων ἐκεῖναι· πλὴν ὅσα μόνον ἀπὸ σπέρματος φύεται, καθάπερ ἐλάτη πεύκη πίτυς. ὅσα δὲ ἔχει σπέρμα καὶ καρπόν, κἂν ἀπὸ ῥίζης γίνηται, καὶ ἀπὸ τούτων· ἐπεὶ καὶ τὰ δοκοῦντα ἄκαρπα εἶναι γεννᾶν φασιν, οἷον πτελέαν ἰτέαν. σημεῖον δὲ λέγουσιν οὐ μόνον ὅτι φύεται πολλὰ τῶν ῥιζῶν ἀπηρτημένα καθ' οὓς ἂν ᾖ τόπους, ἀλλὰ καὶ τὰ συμβαίνοντα θεωροῦντες, οἷον ἐν Φενεῷ τῆς Ἀρκαδίας, ὡς ἐξερράγη τὸ συναθροισθὲν ὕδωρ ἐν τῷ πεδίῳ φραχθέντων τῶν βερέθρων· ὅπου μὲν ἐγγὺς ἦσαν ἰτέαι πεφυκυῖαι τοῦ καταποθέντος τόπου, τῷ ὑστέρῳ ἔτει μετὰ τὴν ἀναξήρανσιν ἐνταῦθα αὖθις ἀναφῦναί φασιν ἰτέαν· ὅπου δὲ πτελέαι αὖθις πτελέας, καθάπερ καὶ ὅπου πεῦκαι καὶ ἔλαται πεύκας καὶ ἐλάτας, ὥσπερ μιμουμένων κἀκείνων.

3 Ἀλλὰ τὴν ἰτέαν ταχὺ προκαταβάλλειν πρὸ τοῦ τελείως ἀδρῦναι καὶ πέψαι τὸν καρπόν· δι' ὃ καὶ τὸν ποιητὴν οὐ κακῶς προσαγορεύειν αὐτὴν ὠλεσίκαρπον.

Τῆς δὲ πτελέας κἀκεῖνο σημεῖον ὑπολαμβάνουσιν· ὅταν γὰρ ἀπὸ τῶν πνευμάτων εἰς τοὺς ἐχομένους τόπους ὁ καρπὸς ἀπενεχθῇ, φύεσθαί φασι. παραπλήσιον δὲ ἔοικεν εἶναι τὸ συμβαῖνον ὃ καὶ ἐπὶ τῶν φρυγανικῶν καὶ ποιωδῶν τινών ἐστιν· οὐκ ἐχόντων γὰρ σπέρμα φανερόν, ἀλλὰ

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[1] *cf.* 5. 4. 6.

[2] 'Katavothra' (now called 'the devil's holes,' see Lawson, cited below); *cf.* Paus. 8. 14; Catull. 68. 109; Plut. *de sera numinis vindicta*, 557 *c*; Plin. 31. 36; Frazer, *Pausanias and other Greek Sketches*, pp. 315 foll.; Lawson, *Modern Greek Folklore and Ancient Greek Religion*, p. 85.

in these two ways—while some of them, such as silver-fir fir and Aleppo pine grow *only* from seed. All those that have seed and fruit, even if they grow from a root, will grow from seed too; for they say that even those which, like elm and willow, appear to have no fruit reproduce themselves. For proof they give the fact that many such trees come up at a distance from the roots of the original tree, whatever the position may be; and further, they have observed a thing which occasionally happens; for instance, when at Pheneos[1] in Arcadia the water which had collected in the plain since the underground channels[2] were blocked burst forth, where there were willows growing near the inundated region, the next year after it had dried up they say that willows grew again; and where there had been elms, elms[3] grew, even as, where there had been firs and silver-firs, these trees reappeared—as if the former trees followed the example[4] of the latter.

But the willow is said to shed its fruit early, before it is completely matured and ripened; and so the poet[5] not unfittingly calls it "the willow which loses its fruit."

That the elm also reproduces itself the following is taken to be a proof: when the fruit is carried by the winds to neighbouring spots, they say that young trees grow from it. Something similar to this appears to be what happens in the case of certain under-shrubs and herbaceous plants; though they have no visible seed, but some of them only a sort of

[3] πτελέας αὖθις πτελέας conj. St.; πτελέας ἀντὶ πελέας U; πτελέας ἀντὶ πτελέας MV; πτελέας αὖθις πτελέας P; πτελέα αὖθις πτελέας Ald.

[4] *i.e.* by growing from seed, as conifers normally do.

[5] Homer, *Od.* 10. 510; *cf.* Plin. 16. 110.

τῶν μὲν οἷον χνοῦν τῶν δ' ἄνθος, ὥσπερ τὸ θύμον, ὅμως ἀπὸ τούτων βλαστάνουσιν. ἐπεὶ ἥ γε πλάτανος ἔχει φανερῶς καὶ ἀπὸ τούτων φύεται. τοῦτο δ' ἐξ ἄλλων τε δῆλον κἀκεῖνο μέγιστον σημεῖον· ὤφθη γὰρ ἤδη ποτὲ πεφυκυῖα πλάτανος ἐν τρίποδι χαλκῷ.

4 Ταύτας τε δὴ τὰς γενέσεις ὑπολητέον εἶναι τῶν ἀγρίων καὶ ἔτι τὰς αὐτομάτους, ἃς καὶ οἱ φυσιολόγοι λέγουσιν· Ἀναξαγόρας μὲν τὸν ἀέρα πάντων φάσκων ἔχειν σπέρματα καὶ ταῦτα συγκαταφερόμενα τῷ ὕδατι γεννᾶν τὰ φυτά· Διογένης δὲ σηπομένου τοῦ ὕδατος καὶ μίξιν τινὰ λαμβάνοντος πρὸς τὴν γῆν· Κλείδημος δὲ συνεστάναι μὲν ἐκ τῶν αὐτῶν τοῖς ζώοις, ὅσῳ δὲ θολερωτέρων καὶ ψυχροτέρων τοσοῦτον ἀπέχειν τοῦ ζῶα εἶναι. [λέγουσι δέ τινες καὶ ἄλλοι περὶ τῆς γενέσεως.]

5 Ἀλλ' αὕτη μὲν ἀπηρτημένη πώς ἐστι τῆς αἰσθήσεως. ἄλλαι δὲ ὁμολογούμεναι καὶ ἐμφανεῖς, οἷον ὅταν ἔφοδος γένηται ποταμοῦ παρεκβάντος τὸ ῥεῖθρον ἢ καὶ ὅλως ἑτέρωθι ποιησαμένου, καθάπερ ὁ Νέσος ἐν τῇ Ἀβδηρίτιδι πολλάκις μεταβαίνει, καὶ ἅμα τῇ μεταβάσει τοσαύτην ὕλην συγγεννᾷ τοῖς τόποις, ὥστε τῷ τρίτῳ ἔτει συνηρεφεῖν. καὶ πάλιν ὅταν ἐπομβρίαι κατάσχωσι πλείω χρόνον· καὶ γὰρ ἐν ταύταις βλαστήσεις γίνονται φυτῶν. ἔοικε δὲ ἡ μὲν τῶν ποταμῶν ἔφοδος ἐπάγειν σπέρματα καὶ καρπούς, καὶ τοὺς ὀχετούς φασι τὰ τῶν ποιωδῶν· ἡ δ' ἐπομβρία

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[1] *cf. C.P.* 1. 5. 2.
[2] Sc. of Apollonia, the 'Ionian' philosopher.
[3] *cf. C.P.* 1. 10. 3; 3. 23. 1; Arist. *Meteor.* 2. 9.

down, and others only a flower, such as thyme, young plants nevertheless grow from these. As for the plane, it obviously has seeds, and seedlings grow from them. This is evident in various ways, and here is a very strong proof—a plane-tree has before now been seen which came up in a brass pot.

Such we must suppose are the ways in which wild trees originate, apart from the spontaneous ways of which natural philosophers tell. [1] Anaxagoras says that the air contains the seeds of all things, and that these, carried down by the rain, produce the plants; while Diogenes [2] says that this happens when water decomposes and mixes in some sort with earth. [3] Kleidemos maintains that plants are made of the same elements as animals, but that they fall short of being animals in proportion as their composition is less pure and as they are colder. [4] And there are other philosophers also who speak of spontaneous generation.

But this kind of generation is somehow beyond the ken of our senses. There are other admitted and observable kinds, as when a river in flood gets over its banks or has altogether changed its course, even as the Nesos in the district of Abdera often alters its course, and in so doing causes such a growth of forest in that region that by the third year it casts a thick shade. The same result ensues when heavy rains prevail for a long time; during these too many plants shoot up. Now, as the flooding of a river, it would appear, conveys seeds of fruits of trees, and, as they say, irrigation channels convey the [5] seeds of herbaceous plants, so heavy

[4] λέγουσι . . . γενεσέως apparently a gloss (W.).
[5] τὰ conj. W.; τὴν MAld.

τοῦτο ποιεῖ ταὐτό· συγκαταφέρει γὰρ πολλὰ τῶν σπερμάτων, καὶ ἅμα σῆψίν τινα τῆς γῆς καὶ τοῦ ὕδατος· ἐπεὶ καὶ ἡ μίξις αὐτὴ τῆς Αἰγυπτίας
6 γῆς δοκεῖ τινα γεννᾶν ὕλην. ἐνιαχοῦ δέ, ἂν μόνον ὑπεργάσωνται καὶ κινήσωσιν, εὐθὺς ἀναβλαστάνει τὰ οἰκεῖα τῆς χώρας, ὥσπερ ἐν Κρήτῃ κυπάριττοι. γίνεται δὲ παραπλήσιόν τι τούτῳ καὶ ἐν τοῖς ἐλάττοσιν· ἅμα γὰρ κινουμένης ἀναβλαστάνει πόα τις ἐν ἑκάστοις. ἐν δὲ τοῖς ἡμιβρόχοις ἐὰν ὑπονεάσῃς φαίνεσθαί φασι τρίβολον. αὗται μὲν οὖν ἐν τῇ μεταβολῇ τῆς χώρας εἰσίν, εἴτε καὶ ἐνυπαρχόντων σπερμάτων εἴτε καὶ αὐτῆς πως διατιθεμένης· ὅπερ ἴσως οὐκ ἄτοπον ἐγκατακλειομένων ἅμα τῶν ὑγρῶν· ἐνιαχοῦ δὲ καὶ ὑδάτων ἐπιγινομένων ἰδιώτερον ἀνατεῖλαι ὕλης πλῆθος, ὥσπερ ἐν Κυρήνῃ πιττώδους τινὸς γενομένου καὶ παχέος· οὕτως γὰρ ἀνεβλάστησεν ἡ πλησίον ὕλη πρότερον οὐκ οὖσα. φασὶ δὲ καὶ τό γε σίλφιον οὐκ ὂν πρότερον ἐκ τοιαύτης τινὸς αἰτίας φανῆναι. τρόποι μὲν οὖν τοιοῦτοι τῶν τοιούτων γενέσεων.

II. Πάντα δὲ κάρπιμα ἢ ἄκαρπα, καὶ ἀείφυλλα ἢ φυλλοβόλα, καὶ ἀνθοῦντα ἢ ἀνανθῆ· κοιναὶ

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[1] ἡ δ' . . . ταὐτὸ conj. W.; ἡ δ' ἐπ. τοῦτ' αὖ ἐποίει ταὐτό UMV (δ' αὖ marked doubtful in U); ἡ δ' ἐπ. τοῦτ' αὐτὸ ἐποίει Ald. [2] Plin. 16. 142.

[3] *i.e.* and is released by working the ground.

[4] *cf. C.P.* 1. 5. 1; Plin. 16. 143, who gives the date A.U.C. 130; *cf.* 19. 41.

rain acts in the same way[1]; for it brings down many of the seeds with it, and at the same time causes a sort of decomposition of the earth and of the water. In fact, the mere mixture of earth with water in Egypt seems to produce a kind of vegetation. And in some places, if the ground is merely lightly worked and stirred, the plants native to the district immediately spring up; [2] for instance, the cypress in Crete. And something similar to this occurs even in smaller plants; as soon as the earth is stirred, wherever it may be, a sort of vegetation comes up. And in partly saturated soil, if you break up the ground, they say that caltrop appears. Now these ways of origination are due to the change which takes place in the soil, whether there were seeds in it already, or whether the soil itself somehow produces the result. And the latter explanation is perhaps not strange, seeing that the moist element is also locked up in the soil.[3] Again, in some places they say that after rain a more singular abundance of vegetation has been known to spring up; for instance, at Cyrene, after a heavy pitchy shower had fallen: for it was under these circumstances that there sprang up the wood[4] which is near the town, though till then it did not exist. They say also that silphium[5] has been known to appear from some such cause, where there was none before. [6] Such are the ways in which these kinds of generation come about.

Of the differences between wild and cultivated trees.

II. All trees are either fruit-bearing or without fruit, either evergreen or deciduous, either flowering

[5] *cf.* 6. 3. [6] τοιοῦτοι MSS.; τοσοῦτοι conj. W.

γάρ τινες διαιρέσεις ἐπὶ πάντων εἰσὶν ὁμοίως ἡμέρων τε καὶ ἀγρίων. ἴδια δὲ πρὸς τὰ ἥμερα τῶν ἀγρίων ὀψικαρπία τε καὶ ἰσχὺς καὶ πολυκαρπία τῷ προφαίνειν· πεπαίνει τε γὰρ ὀψιαίτερον καὶ τὸ ὅλον ἀνθεῖ καὶ βλαστάνει ὡς ἐπὶ τὸ πᾶν· καὶ ἰσχυρότερα τῇ φύσει· καὶ προφαίνει μὲν πλείω καρπὸν ἐκπέττει δ' ἧττον, εἰ μὴ καὶ πάντα ἀλλά γε τὰ ὁμογενῆ, οἷον ἐλάας καὶ ἀπίου κότινος καὶ ἀχράς. ἅπαντα γὰρ οὕτως, πλὴν εἴ τι σπάνιον, ὥσπερ ἐπὶ τῶν κρανείων καὶ τῶν οὔων· ταῦτα γὰρ δή φασι πεπαίτερα καὶ ἡδύτερα τὰ ἄγρια τῶν ἡμέρων εἶναι· καὶ εἰ δή τι ἄλλο μὴ προσδέχεται γεωργίαν ἢ δένδρον ἢ καί τι τῶν ἐλαττόνων, οἷον τὸ σίλφιον καὶ ἡ κάππαρις καὶ τῶν χεδροπῶν ὁ θέρμος, ἃ καὶ μάλιστ' ἄν τις
2 ἄγρια τὴν φύσιν εἴποι. τὸ γὰρ μὴ προσδεχόμενον ἡμέρωσιν, ὥσπερ ἐν τοῖς ζώοις, τοῦτο ἄγριον τῇ φύσει. καίτοι φησὶν Ἵππων ἅπαν καὶ ἥμερον καὶ ἄγριον εἶναι, καὶ θεραπευόμενον μὲν ἥμερον μὴ θεραπευόμενον δὲ ἄγριον, τῇ μὲν ὀρθῶς λέγων τῇ δὲ οὐκ ὀρθῶς. ἐξαμελούμενον γὰρ ἅπαν χεῖρον γίνεται καὶ ἀπαγριοῦται, θεραπευόμενον δὲ οὐχ ἅπαν βέλτιον, ὥσπερ εἴρηται. ὃ δὴ χωριστέον καὶ τὰ μὲν ἄγρια τὰ δ' ἥμερα λεκτέον,

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[1] εἰ μὴ . . . ὁμογενῆ conj. W.; εἰ μὴ καὶ πάντα τὰ ἄλλα καὶ τὰ ὁμοιογενῆ UMVAld.H.

[2] *cf. C.P.* 3. 1. 4. [3] *cf.* 1. 3. 5 n.

[4] *i.e.* the terms 'cultivated' and 'wild' do not denote distinct 'kinds.'

or flowerless; for certain distinctions apply to all trees alike, whether cultivated or wild. To wild trees, as compared with cultivated ones, belong the special properties of fruiting late, of greater vigour, of abundance of fruit, produced if not matured; for they ripen their fruit later, and in general their time of flowering and making growth is later; also they are more vigorous in growth, and so, though they produce more fruit, they ripen it less; if[1] this is not universally true, at least it holds good of the wild olive and pear as compared with the cultivated forms of these trees. This is generally true with few exceptions, as in the cornelian cherry and sorb; for the wild forms of these, they say, ripen their fruit better, and it is sweeter than in the cultivated forms. [2] And the rule also does not hold good of anything which does not admit of cultivation, whether it be a tree or one of the smaller plants, as silphium caper and, among leguminous plants, the lupin; these one might say are specially wild in their character. For, as with animals which do not submit to domestication, so a plant which does not submit to cultivation may be called wild in its essential character. However Hippon[3] declares that of every plant there exists both a cultivated and a wild form, and that 'cultivated' simply means[4] that the plant has received attention, while 'wild' means that it has not; but though he is partly right, he is partly wrong. It is true that any plant deteriorates by neglect and so becomes wild; but it is not true that every plant may be improved by attention,[5] as has been said. Wherefore[6] we must make our distinction and call some things wild, others culti-

[5] *i.e.* and so become 'cultivated.'
[6] ὃ δὴ MSS.; διὸ conj. Sch. from G.

ὥσπερ τῶν ζώων τὰ συνανθρωπευόμενα καὶ τὰ δεχόμενα τιθασείαν.

3 Ἀλλὰ τοῦτο μὲν οὐδὲν ἴσως διαφέρει ποτέρως ῥητέον. ἅπαν δὲ τὸ ἐξαγριούμενον τοῖς τε καρποῖς χεῖρον γίνεται καὶ αὐτὸ βραχύτερον καὶ φύλλοις καὶ κλωσὶ καὶ φλοιῷ καὶ τῇ ὅλῃ μορφῇ· καὶ γὰρ πυκνότερα καὶ οὐλότερα καὶ σκληρότερα καὶ ταῦτα καὶ ὅλη ἡ φύσις γίνεται, ὡς ἐν τούτοις μάλιστα τῆς διαφορᾶς τῶν ἡμέρων καὶ τῶν ἀγρίων γινομένης. δι' ὃ καὶ ὅσα τῶν ἡμερουμένων τοιαῦτα τυγχάνει, ταῦτα ἄγριά φασιν εἶναι, καθάπερ τὴν πεύκην καὶ τὴν κυπάριττον, ἢ ὅλως ἢ τὴν ἄρρενα, καὶ τὴν καρύαν δὲ καὶ τὴν διοσβάλανον.

4 Ἔτι τε τῷ φιλόψυχρα καὶ ὀρεινὰ μᾶλλον εἶναι· καὶ γὰρ τοῦτο λαμβάνεται πρὸς τὴν ἀγριότητα τῶν δένδρων καὶ ὅλως τῶν φυτῶν, εἴτ' οὖν καθ' αὑτὸ λαμβανόμενον εἴτε κατὰ συμβεβηκός.

Ὁ μὲν οὖν τῶν ἀγρίων ἀφορισμὸς εἴθ' οὕτως ἢ καὶ ἄλλως ληπτέος, οὐδὲν ἂν ἴσως διενέγκοι πρὸς τὰ νῦν· ἐκεῖνο δὲ ἀληθές, ὥς γε τῷ τύπῳ καὶ ἁπλῶς εἰπεῖν, ὅτι μᾶλλον ὀρεινὰ τὰ ἄγρια καὶ εὐθενεῖ τὰ πλείω καὶ μᾶλλον ἐν τούτοις τοῖς τόποις, ἐὰν μή τις λαμβάνῃ τὰ φίλυδρα καὶ παραποτάμια καὶ ἀλσώδη. ταῦτα γὰρ καὶ τὰ
5 τοιαῦτα τυγχάνει πεδεινὰ μᾶλλον. οὐ μὴν ἀλλ' ἔν γε τοῖς μεγάλοις ὄρεσιν, οἷον Παρνησῷ τε καὶ Κυλλήνῃ καὶ Ὀλύμπῳ τῷ Πιερικῷ τε καὶ τῷ Μυσίῳ καὶ εἴ που τοιοῦτον ἕτερον, ἅπαντα

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[1] τιθασείαν conj. W., *cf.* Plat. *Pol.* 264 c ; τιθάσιον UMAld.

vated—the latter class corresponding to those animals which live with man and can be tamed.[1]

But perhaps it does not matter which way this should be put. Any tree which runs wild deteriorates in its fruits, and itself becomes dwarfed in leaves branches bark and appearance generally; for under cultivation these parts, as well as the whole growth of the tree, become closer, more compact[2] and harder; which indicates that the difference between cultivated and wild is chiefly shown in these respects. And so those trees which show these characteristics under cultivation they say are really wild, for instance fir cypress, or at least the 'male' kind, hazel and chestnut.

Moreover these wild forms are distinguished by having greater liking for cold and for hilly country: for that too is regarded as a means of recognising wild trees and wild plants generally, whether it is so regarded in itself or as being only incidentally a distinguishing mark.

So the definition of wild kinds, whether it should be thus made or otherwise, perhaps makes no difference for our present purpose. But it is certainly true, speaking[3] broadly and generally, that the wild trees are more to be found in hilly country, and that the greater part of them flourish more in such regions, with the exception of those which love water or grow by river sides or in woods; these and such-like trees are rather trees of the plain. However on great mountains, such as Parnassus Cyllene the Pierian and the Mysian Olympus, and such regions anywhere

[2] *οὐλότερα* conj. W. from G, *spissiora*; *ὀρθότερα* MSS. *cf. C.P.* 6. 11. 8.

[3] *ὥς γε* conj. Sch.; *ὥστε* UM; *ὡς ἐν* Ald.H.

φύεται διὰ τὴν πολυειδίαν τῶν τόπων· ἔχουσι γὰρ καὶ λιμνώδεις καὶ ἐνύγρους καὶ ξηροὺς καὶ γεώδεις καὶ πετρώδεις καὶ τοὺς ἀνὰ μέσον λειμῶνας καὶ σχεδὸν ὅσαι διαφοραὶ τῆς γῆς· ἔτι δὲ τοὺς μὲν κοίλους καὶ εὐδιεινοὺς τοὺς δὲ μετεώρους καὶ προσηνέμους· ὥστε δύνασθαι παντοῖα καὶ τὰ ἐν τοῖς πεδίοις φέρειν.

6 Οὐδὲν δ' ἄτοπον οὐδ' εἰ ἔνια μὴ οὕτω πάμφορα τῶν ὀρῶν, ἀλλ' ἰδιωτέρας τινὸς ὕλης ἢ πάσης ἢ τῆς πλείστης, οἷον ἐν τῇ Κρήτῃ τὰ Ἰδαῖα· κυπάριττος γὰρ ἐκεῖ· καὶ τὰ περὶ Κιλικίαν καὶ Συρίαν, ἐν οἷς κέδρος· ἐνιαχοῦ δὲ τῆς Συρίας τέρμινθος. αἱ γὰρ διαφοραὶ τῆς χώρας τὴν ἰδιότητα ποιοῦσιν. ἀλλ' εἴρηται τὸ ἴδιον ὡς ἐπὶ πᾶν.

III. Ἴδια δὲ τὰ τοιάδε τῶν ὀρεινῶν, ἃ ἐν τοῖς πεδίοις οὐ φύεται, [περὶ τὴν Μακεδονίαν] ἐλάτη πεύκη πίτυς ἀγρία φίλυρα ζυγία φηγὸς πύξος ἀνδράχλη μίλος ἄρκευθος τέρμινθος ἐρινεὸς φιλύκη ἀφάρκη καρύα διοσβάλανος πρῖνος. τὰ δὲ καὶ ἐν τοῖς πεδίοις μυρίκη πτελέα λεύκη ἰτέα αἴγειρος κρανεία θηλυκρανεία κλήθρα δρῦς λακάρη ἀχρὰς μηλέα ὀστρύα κήλαστρον μελία παλίουρος ὀξυάκανθος <σφένδαμνος,> ἣν ἐν μὲν τῷ

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[1] ἐν . . . Ἰδαῖα conj. W. (after Sch., who conj. τὰ ἐν); τὰ ἐν κρήτῃ τῇ Ἰδαίᾳ UAld.

[2] *i.e.* it is not meant that a tree which is 'special' to Mount Ida (*e.g.*) occurs *only* there.

[3] περὶ τὴν Μακ.? a gloss; περί τε τὴν Μακ. MP_2Ald.; τε om. P.

else, all kinds grow, because of the diversity of positions afforded them. For such mountains offer positions which are marshy, wet, dry, deep-soiled or rocky; they have also their meadow land here and there, and in fact almost every variety of soil; again they present positions which lie low and are sheltered, as well as others which are lofty and exposed to wind; so that they can bear all sorts, even those which belong to the plains.

Yet it is not strange that there should be some mountains which do not thus bear all things, but have a more special kind of vegetation to a great extent if not entirely; for instance the range of Ida in Crete[1]; for there the cypress grows; or the hills of Cilicia and Syria, on which the Syrian cedar grows, or certain parts of Syria, where the terebinth grows. For it is the differences of soil which give a special character to the vegetation. [2] (However the word 'special' is used here in a somewhat extended sense.)

Of mountain trees: of the differences found in wild trees.

III. The following trees are peculiar to mountain country and do not grow in the plains; [3] let us take Macedonia as an example. Silver-fir fir 'wild pine' lime *zygia* Valonia oak box andrachne yew Phoenician cedar terebinth wild fig alaternus hybrid arbutus hazel chestnut kermes-oak. The following grow also in the plain: tamarisk elm abele willow black poplar cornelian cherry cornel alder oak *lakare* (bird-cherry) wild pear apple hop-hornbeam holly manna-ash Christ's thorn cotoneaster maple,[4] which

[4] *σφένδαμνος* add. Palm. in view of what follows; *ὀξυάκαρτα ἄκανθος* UPAld.Bas.; *ἄκανθος* P_2.

ὄρει πεφυκυῖαν ζυγίαν καλοῦσιν, ἐν δὲ τῷ πεδίῳ γλεῖνον. οἱ δ' ἄλλως διαιροῦσι καὶ ἕτερον ποιοῦσιν εἶδος σφενδάμνου καὶ ζυγίας.

2 Ἅπαντα δὲ ὅσα κοινὰ τῶν ὀρῶν καὶ τῶν πεδίων, μείζω μὲν καὶ καλλίω τῇ ὄψει τὰ ἐν τοῖς πεδίοις γίνεται, κρείττω δὲ τῇ χρείᾳ τῇ τε τῶν ξύλων καὶ τῇ τῶν καρπῶν τὰ ὀρεινά· πλὴν ἀχράδος καὶ ἀπίου καὶ μηλέας· αὗται δ' ἐν τοῖς πεδίοις κρείττους οὐ μόνον τοῖς καρποῖς ἀλλὰ καὶ τοῖς ξύλοις· ἐν γὰρ τοῖς ὄρεσι μικραὶ καὶ ὀζώδεις καὶ ἀκανθώδεις γίνονται· πάντα δὲ καὶ ἐν τοῖς ὄρεσιν, ὅταν ἐπιλάβωνται τῶν οἰκείων τόπων, καὶ καλλίω φύεται καὶ εὐθενεῖ μᾶλλον· ὡς δὲ ἁπλῶς εἰπεῖν τὰ ἐν τοῖς ὁμαλέσι τῶν ὀρῶν καὶ μάλιστα, τῶν δὲ ἄλλων τὰ ἐν τοῖς κάτω καὶ κοίλοις· τὰ δ' ἐπὶ τῶν ἄκρων χείριστα, πλὴν εἴ τι τῇ φύσει
3 φιλόψυχρον· ἔχει δὲ καὶ ταῦτ' αὖ τινα διαφορὰν ἐν τοῖς ἀνομοίοις τῶν τόπων, ὑπὲρ ὧν ὕστερον λεκτέον· νῦν δὲ διαιρετέον ἕκαστον κατὰ τὰς διαφορὰς τὰς εἰρημένας.

Ἀείφυλλα μὲν οὖν ἐστι τῶν ἀγρίων ἃ καὶ πρότερον ἐλέχθη, ἐλάτη πεύκη πίτυς ἀγρία πύξος ἀνδράχλη μίλος ἄρκευθος τέρμινθος φιλύκη ἀφάρκη δάφνη φελλόδρυς κήλαστρον ὀξυάκανθος πρῖνος μυρίκη· τὰ δὲ ἄλλα πάντα φυλλοβολεῖ· πλὴν εἴ τι περιττὸν ἐνιαχοῦ, καθάπερ ἐλέχθη περὶ τῆς ἐν τῇ Κρήτῃ πλατάνου καὶ δρυὸς καὶ εἴ που τόπος τις ὅλως εὔτροφος.

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[1] δ' ἄλλως conj. Sch. from G ; δ' αὖ Ald. [2] Plin. 16. 77.
[3] *i.e.* are not always of the poorest quality. ταῦτ' αὖ τινα conj. W.; ταῦτα αὐτῶν Ald.H. [4] 1. 9. 3.

when it grows in the mountains, is called *zygia*, when in the plain, *gleinos*: others however,[1] classify differently and make maple and *zygia* distinct trees.

[2] All those trees which are common to both hill and plain are taller and finer in appearance when they grow in the plain; but the mountain forms are better as to producing serviceable timber and fruits, with the exception of wild pear pear and apple; these are in the plain better in fruit and also in timber; for in the hills they grow small with many knots and much spinous wood. But even on the mountains all trees grow fairer and are more vigorous when they have secured a suitable position; and, to speak generally, those which grow on the level parts of the mountains are specially fair and vigorous; next to these come those which grow on the lower parts and in the hollows; while those that grow on the heights are of the poorest quality, except any that are naturally cold-loving. But even these shew some variation[3] in different positions, of which we must speak later; for the present we must in our distinctions in each case take account only of the differences already mentioned.

Now among wild trees those are evergreen which were mentioned before,[4] silver-fir fir 'wild pine' box andrachne yew Phoenician cedar terebinth alaternus hybrid arbutus bay *phellodrys*[5] (holm-oak) holly cotoneaster kermes-oak tamarisk; but all the others shed their leaves, unless it be that in certain places they keep them exceptionally, as was said[6] of the plane and oak in Crete and in any other place which is altogether favourable to luxuriant growth.

[5] φελλόδρυς conj. Bod., *cf.* 1. 9. 3; φελλὸς δρῦς UMV(?)Ald.
[6] 1. 9. 5.

4 Κάρπιμα δὲ τὰ μὲν ἄλλα πάντα· περὶ δὲ ἰτέας καὶ αἰγείρου καὶ πτελέας, ὥσπερ ἐλέχθη, διαμφισβητοῦσιν. ἔνιοι δὲ τὴν αἴγειρον μόνην ἀκαρπεῖν φασιν, ὥσπερ καὶ οἱ ἐν Ἀρκαδίᾳ, τὰ δὲ ἄλλα πάντα τὰ ἐν τοῖς ὄρεσι καρποφορεῖν. ἐν Κρήτῃ δὲ καὶ αἴγειροι κάρπιμοι πλείους εἰσί· μία μὲν ἐν τῷ στομίῳ τοῦ ἄντρου τοῦ ἐν τῇ Ἴδῃ, ἐν ᾧ τὰ ἀναθήματα ἀνάκειται, ἄλλη δὲ μικρὰ πλησίον· ἀπωτέρω δὲ μάλιστα δώδεκα σταδίους περί τινα κρήνην Σαύρου καλουμένην πολλαί. εἰσὶ δὲ καὶ ἐν τῷ πλησίον ὄρει τῆς Ἴδης ἐν τῷ Κινδρίῳ καλουμένῳ καὶ περὶ Ἱραισίαν δὲ ἐν τοῖς ὄρεσιν. οἱ δὲ μόνον τῶν τοιούτων τὴν πτελέαν κάρπιμον εἶναί φασι, καθάπερ οἱ περὶ Μακεδονίαν.

5 Μεγάλη δὲ διαφορὰ πρὸς καρπὸν καὶ ἀκαρπίαν καὶ ἡ τῶν τόπων φύσις, ὥσπερ ἐπί τε τῆς περσέας ἔχει καὶ τῶν φοινίκων· ἡ μὲν ἐν Αἰγύπτῳ καρποφορεῖ καὶ εἴ που τῶν πλησίον τόπων, ἐν Ῥόδῳ δὲ μέχρι τοῦ ἀνθεῖν μόνον ἀφικνεῖται. ὁ δὲ φοῖνιξ περὶ μὲν Βαβυλῶνα θαυμαστός, ἐν τῇ Ἑλλάδι δὲ οὐδὲ πεπαίνει, παρ' ἐνίοις δὲ ὅλως οὐδὲ προφαίνει καρπόν.

6 Ὁμοίως δὲ καὶ ἕτερα πλείω τοιαῦτ' ἐστίν· ἐπεὶ καὶ τῶν ἐλαττόνων ποαρίων καὶ ὑλημάτων ἐν τῇ

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[1] 2. 2. 10.

[2] *cf.* 2. 2. 10. It appears that the buds of the poplar were mistaken for fruit (Sch.); *cf.* Diosc. 1. 81. Later writers perpetuated the error by calling them κόκκοι.

[3] τοῦ ἐν τῇ Ἴδῃ conj. Sch.; τοῦ ἐν τῷ Ἴδῃ U; τοῦ ἐν τῷ Ἴδης MV; ἐν τῇ Ἴδῃ Ald.II.

Most trees are fruit-bearing, but about willow black poplar and elm men hold different opinions, as was said [1]; and some, as the Arcadians, say that only the black poplar is without fruit, but that all the other mountain trees bear fruit. However in Crete there are a number of black poplars which bear fruit [2]; there is one at the mouth of the cave on mount Ida,[3] in which the dedicatory offerings are hung, and there is another small one not far off, and there are quite a number about a spring called the Lizard's Spring about twelve furlongs off. There are also some in the hill-country of Ida in the same neighbourhood, in the district called Kindria and in the mountains about Praisia.[4] Others again, as the Macedonians, say that the elm is the only tree of this class which bears fruit.

Again the character of the position makes a great difference as to fruit-bearing, as in the case of the *persea* [5] and the date-palm. The *persea* of Egypt bears fruit, and so it does wherever it grows in the neighbouring districts, but in Rhodes [6] it only gets as far as flowering. The date-palm in the neighbourhood of Babylon is marvellously fruitful; in Hellas it does not even ripen its fruit, and in some places it does not even produce any.

The same may be said of various other trees: in fact even [7] of smaller herbaceous plants and bushes some are fruitful, others not, although the latter are

[4] Πραισίαν conj. Meurs. *Creta*; τιρασίαν UMVAld.

[5] *cf.* 4. 2. 5. περσέαι conj. R. Const.; περσείας U; περσίας Ald.

[6] Ῥόδῳ conj. R. Const. from G, so too Plin. 16. 111; ῥόα Ald. *cf.* 1. 13. 5. for a similar corruption.

[7] ἐπεὶ καὶ conj. Sch. from G; ἐπεὶ δὲ καὶ Ald.

αὐτῇ χώρᾳ καὶ συνόρῳ χώρᾳ τὰ μὲν κάρπιμα τὰ δ' ἄκαρπα γίνεται· καθάπερ καὶ τὸ κενταύριον ἐν τῇ Ἠλείᾳ, τὸ μὲν ἐν τῇ ὀρεινῇ κάρπιμον, τὸ δ' ἐν τῷ πεδίῳ ἄκαρπον ἀλλὰ μόνον ἀνθεῖ, τὸ δ' ἐν τοῖς κοίλοις τόποις οὐδ' ἀνθεῖ πλὴν κακῶς. δοκεῖ δ' οὖν καὶ τῶν ἄλλων τῶν ὁμογενῶν καὶ ἐν μιᾷ προσηγορίᾳ τὸ μὲν ἄκαρπον εἶναι τὸ δὲ κάρπιμον, οἷον πρῖνος ὁ μὲν κάρπιμος ὁ δ' ἄκαρπος· καὶ
7 κλήθρα δὲ ὡσαύτως· ἀνθεῖ δ' ἄμφω. σχεδὸν δὲ ὅσα καλοῦσιν ἄρρενα τῶν ὁμογενῶν ἄκαρπα· καὶ τούτων τὰ μὲν πολλὰ ἀνθεῖν φασι τὰ δ' ὀλίγον τὰ δ' ὅλως οὐδ' ἀνθεῖν· τὰ δὲ ἀνάπαλιν, τὰ μὲν ἄρρενα μόνα καρποφορεῖν, οὐ μὴν ἀλλ' ἀπό γε τῶν ἀνθῶν φύεσθαι τὰ δένδρα, καθάπερ καὶ ἀπὸ τῶν καρπῶν ὅσα κάρπιμα· καὶ ἐν ἀμφοῖν οὕτως ἐνίοτε πυκνὴν εἶναι τὴν ἔκφυσιν ὥστε τοὺς ὀρεοτύπους οὐ δύνασθαι διϊέναι μὴ ὁδοποιησαμένους.

8 Ἀμφισβητεῖται δὲ καὶ περὶ τῶν ἀνθῶν ἐνίων, ὥσπερ εἴπομεν. οἱ μὲν γὰρ καὶ δρῦν ἀνθεῖν οἴονται καὶ τὴν Ἡρακλεῶτιν καρύαν καὶ διοσβάλανον, ἔτι δὲ πεύκην καὶ πίτυν· οἱ δ' οὐδὲν τούτων, ἀλλὰ τὸν ἴουλον τὸν ἐν ταῖς καρύαις καὶ τὸ βρύον τὸ δρύϊνον καὶ τὸν κύτταρον τὸν πιτύ-

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[1] χώρᾳ καὶ Ald. ; ἢ καὶ conj. St.

[2] *i.e.* the 'males' are sterile whether they flower or not. καὶ τούτων τὰ μὲν πολλὰ I conj.; τούτων τὰ πολλὰ τὰ μὲν Ald.

[3] ? *i.e.* the flowers of the 'female' tree.

[4] *i.e.* (*a*) in those trees whose 'male' form is sterile, whether it bears flowers or not; (*b*) in those whose 'male'

growing in the same place as the former, or[1] quite near it. Take for instance the centaury in Elea; where it grows in hill-country, it is fruitful; where it grows in the plain, it bears no fruit, but only flowers; and where it grows in deep valleys, it does not even flower, unless it be scantily. Any way it appears that, even of other plants which are of the same kind and all go by the same name, one will be without fruit, while another bears fruit; for instance, one kermes-oak will be fruitful, another not; and the same is true of the alder, though both produce flowers. And, generally speaking, all those of any given kind which are called 'male' trees are without fruit, and that though[2] some of these, they say, produce many flowers, some few, some none at all. On the other hand they say that in some cases it is only the 'males' that bear fruit, but that, in spite of this, the trees grow from the flowers,[3] (just as in the case of fruit-bearing trees they grow from the fruit). And they add that in both cases,[4] the crop of seedlings[5] which comes up is sometimes so thick that the woodmen cannot get through except by clearing a way.

There is also a doubt about the flower of some trees, as we said. Some think that the oak bears flowers, and also the filbert the chestnut and even the fir and Aleppo pine: some however think that none of these has a flower, but that,—resembling[6] and corresponding to the wild figs which drop off prematurely, we have in the nuts the catkin,[7] in the

form alone bears fruit, but the fruit is infertile. The passage is obscure: W. gives up the text.

[5] *ἔκφυσιν*. *cf.* 7. 4. 3.

[6] *ὅμοιον* conj. W.; *ὁμοίαν* UAld. *cf.* 3. 7. 3.

[7] *cf.* 3. 5. 5.

ἴνον ὅμοιον καὶ ἀνάλογον εἶναι τοῖς προαποπτώτοις ἐρινοῖς. οἱ δὲ περὶ Μακεδονίαν οὐδὲ ταῦτά φασιν ἀνθεῖν ἄρκευθον ὀξύην ἀρίαν σφένδαμνον. ἔνιοι δὲ τὰς ἀρκεύθους δύο εἶναι, καὶ τὴν μὲν ἑτέραν ἀνθεῖν μὲν ἄκαρπον δ' εἶναι, τὴν δὲ ἑτέραν οὐκ ἀνθεῖν μὲν καρπὸν δὲ φέρειν εὐθὺς προφαινόμενον, ὥσπερ καὶ τὰς συκᾶς τὰ ἐρινά. συμβαίνει δ' οὖν ὥστε ἐπὶ δύο ἔτη τὸν καρπὸν ἔχειν μόνον τοῦτο τῶν δένδρων. ταῦτα μὲν οὖν ἐπισκεπτέον.

IV. Ἡ δὲ βλάστησις τῶν μὲν ἅμα γίνεται καὶ τῶν ἡμέρων, τῶν δὲ μικρὸν ἐπιλειπομένη, τῶν δ' ἤδη πλέον, ἁπάντων δὲ κατὰ τὴν ἠρινὴν ὥραν. ἀλλὰ τῶν καρπῶν ἡ παραλλαγὴ πλείων· ὥσπερ δὲ καὶ πρότερον εἴπομεν, οὐ κατὰ τὰς βλαστήσεις αἱ πεπάνσεις ἀλλὰ πολὺ διαφέρουσιν· ἐπεὶ καὶ τῶν ὀψικαρποτέρων, ἃ δή τινές φασιν ἐνιαυτοφορεῖν, οἷον ἄρκευθον καὶ πρῖνον, ὅμως αἱ βλαστήσεις τοῦ ἦρος. αὐτὰ δ' αὑτῶν τὰ ὁμογενῆ τῷ πρότερον καὶ ὕστερον διαφέρει κατὰ τοὺς τόπους· πρῶτα μὲν γὰρ βλαστάνει τὰ ἐν τοῖς ἕλεσιν, ὡς οἱ περὶ Μακεδονίαν λέγουσι, δεύτερα δὲ τὰ ἐν τοῖς πεδίοις, ἔσχατα δὲ τὰ ἐν τοῖς ὄρεσιν.

2 Αὐτῶν δὲ τῶν καθ' ἕκαστα δένδρων τὰ μὲν

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[1] *i.e.* the male flower, *cf.* Schol. on Ar. *Vesp.* 1111. Θεόφραστος κυρίως λέγει κύτταρον τὴν προάνθησιν τῆς πίτυος: but no explanation of such a use of the word suggests itself. *cf.* 3. 3. 8; 4. 8. 7.

[2] ἀρίαν conj. Sch., *cf.* 3. 4. 2; 3. 16. 3; 3. 17. 1; ὀξύνην ἀγρίαν Ald.

oak the oak-moss, in the pine the 'flowering tuft.'[1] The people of Macedonia say that these trees also produce no flowers—Phoenician cedar beech *aria*[2] (holm-oak) maple. Others distinguish two kinds of Phoenician cedar, of which one bears flowers but bears no fruit, while the other, though it has no flower, bears a fruit which shows itself at once[3]—just as wild figs produce their abortive fruit. However that may be,[4] it is a fact that this is the only tree which keeps its fruit for two years. These matters then need enquiry.

Of the times of budding and fruiting of wild, as compared with cultivated, trees.

IV. Now the budding of wild trees occurs in some cases at the same time as that of the cultivated forms, but in some cases somewhat, and in some a good deal later; but in all cases it is during the spring season. But there is greater diversity in the time of fruiting; as we said before, the times of ripening do not correspond to those of budding, but there are wide differences. For even in the case of those trees which are somewhat late in fruiting,—which some say take a year to ripen their fruit—such as Phoenician cedar and kermes-oak, the budding nevertheless takes place in the spring. Again there are differences of time between individual trees of the same kind, according to the locality; those in the marshes bud earliest, as the Macedonians say, second to them those in the plains, and latest those in the mountains.

Again of particular trees some wild ones bud

[3] *i.e.* without antecedent flower.
[4] δ' οὖν conj. W.; σχεδὸν UMVAld.

συναναβλαστάνει τοῖς ἡμέροις, οἷον ἀνδράχλη ἀφάρκη· ἀχρὰς δὲ μικρῷ ὕστερον τῆς ἀπίου. τὰ δὲ καὶ πρὸ ζεφύρου καὶ μετὰ πνοὰς εὐθὺ ζεφύρου. καὶ πρὸ ζεφύρου μὲν κρανεία καὶ θηλυκρανεία, μετὰ ζέφυρον δὲ δάφνη κλήθρα, πρὸ ἰσημερίας δὲ μικρὸν φίλυρα ζυγία φηγὸς συκῆ· πρωΐβλαστα δὲ καὶ καρύα καὶ δρῦς καὶ ἀκτέος· ἔτι δὲ μᾶλλον τὰ ἄκαρπα δοκοῦντα καὶ ἀλσώδη, λεύκη πτελέα ἰτέα αἴγειρος· πλάτανος δὲ μικρῷ ὀψιαίτερον τούτων. τὰ δὲ ἄλλα ὥσπερ ἐνισταμένου τοῦ ἦρος, οἷον ἐρινεὸς φιλύκη ὀξυάκανθος παλίουρος τέρμινθος καρύα διοσβάλανος· μηλέα δ' ὀψίβλαστος· ὀψιβλαστότατον δὲ σχεδὸν ἴψος ἀρία τετραγωνία θύεια μίλος. αἱ μὲν οὖν βλαστήσεις οὕτως ἔχουσιν.

3 Αἱ δὲ ἀνθήσεις ἀκολουθοῦσι μὲν ὡς εἰπεῖν κατὰ λόγον, οὐ μὴν ἀλλὰ παραλλάττουσι, μᾶλλον δὲ καὶ ἐπὶ πλέον ἡ τῶν καρπῶν τελείωσις. κρανεία μὲν γὰρ ἀποδίδωσι περὶ τροπὰς θερινὰς ἡ πρώϊος σχεδὸν ὥσπερ πρῶτον· ἡ δ' ὄψιος, ἣν δή τινες καλοῦσι θηλυκρανείαν, μετ' αὐτὸ τὸ μετόπωρον· ἔστι δὲ ὁ ταύτης καρπὸς ἄβρωτος καὶ τὸ ξύλον ἀσθενὲς καὶ χαῦνον· τοσαύτη δὴ διαφορὰ περὶ
4 ἄμφω. τέρμινθος δὲ περὶ πυροῦ ἀμητὸν ἢ μικρῷ

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[1] See below, n. 4.

[2] τὰ ἀκ. δοκ. καὶ ἀλσ. conj. W.; τὰ ἀκ. καὶ δυκ. καὶ ἀλσ. U MP; τὰ ἀκ. τὰ δοκ. ἀλσ. Ald.

[3] ὥσπερ apologises for the unusual sense given to ἐνιστ.

along with the cultivated forms, as andrachne and hybrid arbutus; and the wild pear is a little later than the cultivated. Some again bud both before zephyr begins to blow, and immediately after it has been blowing. Before it come cornelian cherry and cornel, after it bay and alder; a little before the spring equinox come lime *zygia* Valonia oak fig. Hazel[1] oak and elder are also early in budding, and still more those trees which seem to have no fruit and to grow in groves,[2] abele elm willow black poplar; and the plane is a little later than these. The others which bud when the spring is, as it were, becoming established,[3] are such as wild fig alaternus cotoneaster Christ's thorn terebinth hazel[4] chestnut. The apple is late in budding, latest of all generally are *ipsos*[5] (cork-oak) *aria* (holm-oak) *tetragonia* odorous cedar yew. Such are the times of budding.

The flowering times in general follow in proportion; but they present some irregularity, and so in still more cases and to a greater extent do the times at which the fruit is matured. The cornelian cherry produces its fruit about the summer solstice; the early kind, that is to say, and this tree is about the earliest of all.[6] The late form, which some call 'female cornelian cherry' (cornel), fruits quite at the end of autumn. The fruit of this kind is inedible and its wood is weak and spongy; that is what the difference between the two kinds amounts to. The terebinth produces its fruit about the time of wheat-harvest or

(usually 'beginning'). τὰ δ' ἄλλα ὥσπερ ἐνιστ. conj. W.; τὰ δ' ἄλλως περ' U; τὰ δὲ ἄλλως περιενισταμένου M Ald. H.

[1] καρύα can hardly be right both here and above.

[5] See Index.

[6] σχεδὸν ὥσπερ πρῶτον not in G, nor in Plin. (16. 105); text perhaps defective.

ὀψιαίτερον ἀποδίδωσι καὶ μελία καὶ σφένδαμνος τοῦ θέρους τὸν καρπόν· κλήθρα δὲ καὶ καρύα καὶ ἀχράδων τι γένος μετοπώρου· δρῦς δὲ καὶ διοσβάλανος ὀψιαίτερον ἔτι περὶ Πλειάδος δύσιν, ὡσαύτως δὲ καὶ φιλύκη καὶ πρῖνος καὶ παλίουρος καὶ ὀξυάκανθος μετὰ Πλειαδος δύσιν· ἡ δ' ἀρία χειμῶνος ἀρχομένου· καὶ ἡ μηλέα μὲν τοῖς πρώτοις ψύχεσιν, ἀχρὰς δὲ ὀψία χειμῶνος· ἀνδράχλη δὲ καὶ ἀφάρκη τὸ μὲν πρῶτον πεπαίνουσιν ἅμα τῷ βότρυϊ περκάζοντι, τὸ δὲ ὕστερον, δοκεῖ γὰρ ταῦτα δίκαρπα, ἀρχομένου τοῦ χειμῶνος, ἐλάτη δὲ καὶ
5 μίλος ἀνθοῦσι μικρὸν πρὸ ἡλίου τροπῶν· [καὶ τῆς γε ἐλάτης τὸ ἄνθος κρόκινον καὶ ἄλλως καλόν·] τὸν δὲ καρπὸν ἀφιᾶσι μετὰ δύσιν Πλειάδος. πεύκη δὲ καὶ πίτυς προτεροῦσι τῇ βλαστήσει μικρόν, ὅσον πεντεκαίδεκα ἡμέραις, τοὺς δὲ καρποὺς ἀποδιδόασι μετὰ Πλειάδα κατὰ λόγον.

Ταῦτα μὲν οὖν μετριωτέραν μὲν ἔχει παραλλαγήν· πάντων δὲ πλείστην ἡ ἄρκευθος καὶ ἡ κήλαστρος καὶ ἡ πρῖνος· ἡ μὲν γὰρ ἄρκευθος ἐνιαύσιον ἔχειν δοκεῖ· περικαταλαμβάνει γὰρ ὁ νέος τὸν περυσινόν. ὡς δέ τινές φασιν, οὐδὲ πεπαίνει, δι' ὃ καὶ προαφαιροῦσι καὶ χρόνον τινὰ τηροῦσιν· ἐὰν δὲ ἐᾷ
6 ἐπὶ τοῦ δένδρου τις, ἀποξηραίνεται. φασὶ δὲ καὶ τὴν πρῖνον οἱ περὶ Ἀρκαδίαν ἐνιαυτῷ τελειοῦν· ἅμα γὰρ τὸν ἔνον πεπαίνει καὶ τὸν νέον ὑποφαίνει· ὥστε τοῖς τοιούτοις συμβαίνει συνεχῶς τὸν καρπὸν ἔχειν. φασὶ δέ γε καὶ τὴν κήλαστρον ὑπὸ τοῦ

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[1] ἀποδ. καὶ μελία U ; ἀποδίδωσι· μελία Ald. Some confusion in text, but sense clear.

[2] ὀψία : ? ἡ ὀψία W.

a little later, manna-ash[1] and maple in summer; alder hazel and a certain kind of wild pear in autumn; oak and chestnut later still, about the setting of the Pleiad; and in like manner alaternus kermes-oak Christ's-thorn cotoneaster after the setting of the Pleiad; *aria* (holm-oak) when winter is beginning, apple with the first cold weather, wild pear late[2] in winter. Andrachne and hybrid arbutus first ripen their fruit when the grape is turning, and again[3] when winter is beginning; for these trees appear to bear twice. As for[4] silver-fir and yew, they flower a little before the solstice; [5](the flower of the silver-fir is yellow and otherwise pretty); they bear their fruit after the setting of the Pleiad. Fir and Aleppo pine are a little earlier in budding, about fifteen days, but produce their fruit after the setting of the Pleiad, though proportionately earlier than silver-fir and yew.

In these trees then the difference of time is not considerable; the greatest difference is shewn in Phoenician cedar holly and kermes-oak; for Phoenician cedar appears to keep its fruit for a year, the new fruit overtaking that of last year; and, according to some, it does not ripen it at all; wherefore men gather it unripe and keep it, whereas if it is left on the tree, it shrivels up. The Arcadians say that the kermes-oak also takes a year to perfect its fruit; for it ripens last year's fruit at the same time that the new fruit appears on it; the result of which is that such trees always have fruit on them. They say also

[3] After ὕστερον Ald. adds ἀνθοῦντι (so also H and G); Plin. 13. 121. omits it; om. W. after Sch.

[4] γὰρ Ald.; δὲ conj. W.

[5] Probably an early gloss, W. *cf.* Plin. 16. 106.

χειμῶνος ἀποβάλλειν. ὀψίκαρπα δὲ σφόδρα καὶ φίλυρα καὶ πύξος. [τὸν δὲ καρπὸν ἄβρωτον ἔχει παντὶ ζώῳ φίλυρα θηλυκρανεία πύξος. ὀψίκαρπα δὲ καὶ κιττὸς καὶ ἄρκευθος καὶ πεύκη καὶ ἀνδράχλη.] ὡς δὲ οἱ περὶ Ἀρκαδίαν φασίν, ἔτι τούτων ὀψικαρπότερα σχεδὸν δὲ πάντων ὀψιαίτερα τετραγωνία θύεια μίλος. αἱ μὲν οὖν τῶν καρπῶν ἀποβολαὶ καὶ πεπάνσεις τῶν ἀγρίων τοιαύτας ἔχουσι διαφορὰς οὐ μόνον πρὸς τὰ ἥμερα ἀλλὰ καὶ πρὸς ἑαυτά.

V. Συμβαίνει δ' ὅταν ἄρξωνται βλαστάνειν τὰ μὲν ἄλλα συνεχῆ τήν τε βλάστησιν καὶ τὴν αὔξησιν ποιεῖσθαι, πεύκην δὲ καὶ ἐλάτην καὶ δρῦν διαλείπειν, καὶ τρεῖς ὁρμὰς εἶναι καὶ τρεῖς ἀφιέναι βλαστούς, δι' ὃ καὶ τρίσλοποι· πᾶν γὰρ δὴ δένδρον ὅταν βλαστάνῃ λοπᾷ· πρῶτον μὲν ἄκρου ἔαρος εὐθὺς ἱσταμένου τοῦ Θαργηλιῶνος, ἐν δὲ τῇ Ἴδῃ περὶ πεντεκαίδεκα μάλιστα ἡμέρας· μετὰ δὲ ταῦτα διαλιπόντα περὶ τριάκοντα ἢ μικρῷ πλείους ἐπιβάλλεται πάλιν ἄλλους βλαστοὺς ἀπ' ἄκρας τῆς κορυνήσεως τῆς ἐπὶ τῷ προτέρῳ βλαστῷ· καὶ τὰ μὲν ἄνω τὰ δ' εἰς τὰ πλάγια κύκλῳ ποιεῖται τὴν βλάστησιν, οἷον γόνυ

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[1] φίλυρα Ald.; φιλυρέα conj. Sch.

[2] τὸν δὲ . . . . ἀνδράχλη. Apparently a gloss, W.

[3] τετραγωνία conj. Sch. (τετρα- omitted after -τερα) : *cf.* § 2; γωνία MV ; γωνίεια U.

[4] τῶν ἀγρίων after πεπάνσεις conj. Sch.; after ἥμερα Ald.

[5] Plin. 16. 100.

that holly loses its fruit owing to the winter. Lime[1] and box are very late in fruiting, (lime has a fruit which no animal can eat, and so have cornel and box. Ivy Phoenician cedar fir and andrachne are late fruiting[2]) though, according to the Arcadians, still later than these and almost latest of all are *tetragonia*[3] odorous cedar and yew. Such then are the differences as to the time of shedding and ripening their fruit between wild[4] as compared with cultivated trees, and likewise as compared with one another.

Of the seasons of budding.

V. [5] Now most trees, when they have once begun to bud, make their budding and their growth continuously, but with fir silver-fir and oak there are intervals. They make three fresh starts in growth and produce three separate sets of buds; wherefore also they lose their bark thrice[6] a year. For every tree loses its bark when it is budding. This first happens in mid-spring[7] at the very beginning of the month Thargelion,[8] on Mount Ida within about fifteen days of that time; later, after an interval of about thirty days or rather more, the tree[9] puts on fresh buds which start from the head of the knobby growth[10] which formed at the first budding-time; and it makes its budding partly on the top of this,[11] partly all round it laterally,[12] using the knob formed at the

[6] *τρίσλοκοι* conj. Sch.; *τρίσλοικοι* UM_2V; *τρίσλεκοι* M_1Ald. *cf.* 4. 15. 3; 5. 1. 1.

[7] *ἔαρος* conj. R. Const.; *ἀέρος* VAld. *cf.* Plin. *l.c.*

[8] About May.

[9] What follows evidently applies only to the oak.

[10] *κορυνησέως* conj. Sch.; *κορύνης ἕως* UMV; *κορυφῆς ἕως* Ald.

[11] *cf.* 3. 6. 2. [12] *τὰ* add. Sch.

ποιησάμενα τὴν τοῦ πρώτου βλαστοῦ κορύνην, ὥσπερ καὶ ἡ πρώτη βλάστησις ἔχει. γίνεται δὲ τοῦτο περὶ τὸν Σκιρροφοριῶνα λήγοντα.

2 Κατὰ δὲ ταύτην τὴν βλάστησιν καὶ ἡ κηκὶς φύεται πᾶσα, καὶ ἡ λευκὴ καὶ ἡ μέλαινα· φύεται δὲ ὡς ἐπὶ τὸ πολὺ νυκτὸς ἀθρόος· ἐφ' ἡμέραν δὲ μίαν αὐξηθεῖσα, πλὴν τῆς πιττοειδοῦς, ἐὰν ὑπὸ τοῦ καύματος ληφθῇ ξηραίνεται, καὶ ἀναυξὴς ἐπὶ τὸ μεῖζον, ἐγίνετο γὰρ ἂν μείζων τῷ μεγέθει. διόπερ τινὲς αὐτῶν οὐ μεῖζον ἔχουσι κυάμου τὸ μέγεθος. ἡ δὲ μέλαινα καὶ ἐπὶ πλείους ἡμέρας ἔγχλωρός ἐστι, καὶ αὐξάνονται καὶ λαμβάνουσιν ἔνιαι μέγεθος μήλου.

Διαλείποντα δὲ μετὰ τοῦτο περὶ πεντεκαίδεκα ἡμέρας πάλιν τὸ τρίτον ἐπιβάλλεται βλαστοὺς Ἑκατομβαιῶνος, ἐλαχίστας ἡμέρας τῶν πρότερον· ἴσως γὰρ ἓξ ἢ ἑπτὰ τὸ πλεῖστον· ἡ δὲ βλάστησις ὁμοία καὶ τὸν αὐτὸν τρόπον. παρελθουσῶν δὲ τούτων οὐκέτι εἰς μῆκος ἀλλ' εἰς πάχος ἡ αὔξησις τρέπεται.

3 Πᾶσι μὲν οὖν τοῖς δένδροις αἱ βλαστήσεις φανεραί, μάλιστα δὲ τῇ ἐλάτῃ καὶ τῇ πεύκῃ διὰ τὸ στοιχεῖν τὰ γόνατα καὶ ἐξ ἴσου τοὺς ὄζους ἔχειν. ὥρα δὲ καὶ πρὸς τὸ τέμνεσθαι τὰ ξύλα τότε διὰ τὸ λοπᾶν· ἐν γὰρ τοῖς ἄλλοις καιροῖς οὐκ εὐπεριαίρετος ὁ φλοιός, ἀλλὰ καὶ περιαιρεθέντος μέλαν τὸ ξύλον γίνεται καὶ τῇ ὄψει χεῖρον· ἐπεὶ καὶ πρός γε τὴν χρείαν οὐδέν, ἀλλὰ καὶ

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[1] About June.
[2] *cf.* 3. 7. 4; 3. 8. 6; Plin. 16. 27.
[3] ἔγχλωρος conj. Coraës; εὔχλωρος Ald.
[4] διαλείποντα conj. St.; διαλείπουσαι Ald.H.

first budding as a sort of joint, just as in the case of the first budding. This happens about the end of the month Skirrophorion.[1]

[2](It is only at the time of this second budding that the galls also are produced, both the white and the black; the liquid forming them is mostly produced in quantity at night, and, after swelling for one day —except the part which is of resinous character—it hardens if it is caught by the heat, and so cannot grow any more; otherwise it would have grown greater in bulk; wherefore in some trees the formation is not larger than a bean. The black gall is for several days of a pale green[3] colour; then it swells and sometimes attains the size of an apple.)

Then, after an interval[4] of about fifteen days, the tree for the third time puts on buds in the month Hekatombaion[5]; but this growth continues for fewer days than on either of the previous occasions, perhaps for six or seven at most. However the formation of the buds is as before and takes place in the same manner. After this period there is no increase in length, but the only increase is in thickness.

The periods of budding can be seen in all trees, but especially in fir and silver-fir, because the joints of these are in a regular series and have the knots at even distances. It is then the season also for cutting the timber, because the bark is being shed[6]; for at other times the bark is not easy to strip off, and moreover, if it is stripped off, the wood turns black[7] and is inferior in appearance; for as to its utility[8] this makes no difference, though the wood

[5] About July.
[6] λοπᾶν conj. Sch.; λοιπᾶν UMV; λιπᾶν Ald.
[7] *cf.* Plin. 16. 74.
[8] γε conj. Sch.; τε Ald.

ἰσχυρότερον, ἐὰν μετὰ τὴν πέπανσιν τῶν καρπῶν τμηθῇ.

4 Ταῦτα μὲν οὖν ἴδια τῶν προειρημένων δένδρων. αἱ δὲ βλαστήσεις αἱ ἐπὶ Κυνὶ καὶ Ἀρκτούρῳ γινόμεναι μετὰ τὴν ἐαρινὴν σχεδὸν κοιναὶ πάντων· ἔνδηλοι δὲ μᾶλλον ἐν τοῖς ἡμέροις καὶ τούτων μάλιστα συκῇ καὶ ἀμπέλῳ καὶ ῥοιᾷ καὶ ὅλως ὅσα εὐτραφῆ καὶ ὅπου χώρα τοιαύτη· δι' ὃ καὶ τὴν ἐπ' Ἀρκτούρῳ πλείστην φασὶ γίνεσθαι περὶ Θετταλίαν καὶ Μακεδονίαν· ἅμα γὰρ συμβαίνει καὶ τὸ μετόπωρον καλὸν γίνεσθαι καὶ μακρόν, ὥστε καὶ τὴν μαλακότητα συμβάλλεσθαι τοῦ ἀέρος. ἐπεὶ καὶ ἐν Αἰγύπτῳ διὰ τοῦθ' ὡς εἰπεῖν αἰεὶ βλαστάνει τὰ δένδρα, ἢ καὶ μικρόν τινα διαλείπει χρόνον.

5 Ἀλλὰ τὰ μὲν περὶ τὰς ἐπιβλαστήσεις, ὥσπερ εἴρηται, κοινά, τὰ δὲ περὶ τὰς διαλείψεις ἀπὸ τῆς πρώτης ἴδια τῶν λεχθέντων. ἴδιον δ' ἐνίοις ὑπάρχει καὶ τὸ τῆς καλουμένης κάχρυος, οἷον τοῖς [τε] προειρημένοις· ἔχει γὰρ καὶ ἐλάτη καὶ πεύκη καὶ δρῦς, καὶ ἔτι φίλυρα καὶ καρύα καὶ διοσβάλανος καὶ πίτυς. αὗται δὲ γίνονται δρυὶ μὲν πρὸ τῆς βλαστήσεως ὑποφαινούσης τῆς ἠρινῆς ὥρας. ἔστι δ' ὡσπερεὶ κύησις φυλλικὴ μεταξὺ πίπτουσα τῆς ἐξ ἀρχῆς ἐποιδήσεως καὶ τῆς φυλλικῆς βλαστήσεως· τῇ δ' ὅῃ ἐστὶ τοῦ

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[1] δένδρων conj. R. Const.; καρπῶν Ald.H.
[2] *cf. C.P.* 1. 10. 6; 1. 12. 4; 1. 13. 3; 1. 13. 5; 1. 13. 10; Plin. 16. 98. [3] *cf. C.P.* 1. 14. 11. [4] *cf.* 5. 1. 4; Plin. 16. 30.

is stronger if it is cut after the ripening of the fruit.

Now what has been said is peculiar to the above-mentioned trees.[1] [2] But the buddings which take place at the rising of the dog-star and at that of Arcturus after the spring budding are common to nearly all, though they may be most clearly seen in cultivated trees, and, among these, especially in fig vine pomegranate, and in general in all those that are luxuriant in growth or are growing in rich soil. Accordingly they say that the budding at the rising of Arcturus is most considerable in Thessaly and Macedonia[3]; for it also happens that the autumn in these countries is a fair and a long season; so that the mildness of the climate also contributes. Indeed it is for this reason, one may say, that in Egypt too the trees are always budding, or at least that the process is only suspended for quite a short time.

Now the facts as to the later buddings apply, as has been said, to all trees alike; but those which belong to the intervals after the first period of budding are peculiar to those mentioned above. Peculiar to some also is the growth of what are called 'winter buds,'[4] for instance in the above-mentioned trees; silver-fir fir and oak have them, and also lime hazel chestnut and Aleppo pine. These are found in the oak before the leaf-buds grow, when the spring season is just beginning. This growth consists of a sort of leaf-like formation,[5] which occurs between the first swelling of the leaf-buds and the time when they burst into leaf. In the sorb[6] it

[5] *ἐστι . . . φυλλικὴ*: *ἐστι* conj. R. Const.; *ὥσπερεὶ* conj. Sch.; *ἔτι δὲ ὥσπερ ἡ κύησις φυλακὴ* UAld.H.; *φυλλικὴ* mBas. etc.

[6] *τῇ δ' ὄῃ ἐστὶ* conj. W. (*cf.* the description of *ὄῃ*, 3. 12. 8); *τῇ δ' ἰδιότητι* Ald.

μετοπώρου μετὰ τὴν φυλλοβολίαν εὐθὺς λιπαρά τις καὶ ὥσπερ ἐπωδηκυῖα, καθαπερανεὶ μέλλουσα βλαστάνειν, καὶ διαμένει τὸν χειμῶνα μέχρι τοῦ ἦρος. ἡ δὲ Ἡρακλεωτικὴ μετὰ τὴν ἀποβολὴν τοῦ καρποῦ φύει τὸ βοτρυῶδες ἡλίκον σκώληξ εὐμεγέθης, ἐξ ἑνὸς μίσχου πλείω δή, ἃ καλοῦσί τινες
6 ἰούλους. τούτων ἕκαστον ἐκ μικρῶν σύγκειται μορίων φολιδωτῶν τῇ τάξει, καθάπερ οἱ στρόβιλοι τῆς πεύκης, ὥστε μὴ ἀνομοίαν εἶναι τὴν ὄψιν στροβίλῳ νέῳ καὶ χλωρῷ πλὴν προμηκέστερον καὶ σχεδὸν ἰσόπαχες διόλου. τοῦτο δὲ αὔξεται τὸν χειμῶνα· (καὶ ἅμα τῷ ἦρι χάσκει τὰ φολιδωτὰ καὶ ξανθὰ γίνεται), καὶ τὸ μῆκος λαμβάνει καὶ τριδάκτυλον· ὅταν δὲ τοῦ ἦρος τὸ φύλλον βλαστάνῃ, ταῦτ' ἀποπίπτει καὶ τὰ τοῦ καρύου καλυκώδη περικάρπια γίνεται συμμεμυκότα κατὰ τοῦ μίσχου, τοσαῦτα ὅσα καὶ ἦν τὰ ἄνθη· τούτων δ' ἐν ἑκάστῳ κάρυον ἕν. περὶ δὲ τῆς φιλύρας ἐπισκεπτέον, καὶ εἴ τι ἄλλο καχρυοφόρον.

VI. Ἔστι δὲ καὶ τὰ μὲν εὐαυξῆ τὰ δὲ δυσαυξῆ. εὐαυξῆ μὲν τά τε πάρυδρα, οἷον πτελέα πλάτανος λεύκη αἴγειρος ἰτέα· καί τοι περὶ ταύτης ἀμφισβητοῦσί τινες ὡς δυσαυξοῦς· καὶ τῶν καρποφόρων δὲ ἐλάτη πεύκη δρῦς. εὐαυξέστατον δὲ . . . μίλος

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[1] εὐθὺς λιπαρὰ conj. Sch.; τις add. W.; εὐθὺς αἱ παρὰ τῆς U.
[2] φύει conj. W.; φύεται Ald. [3] *i.e.* catkins. *cf.* 3. 3. 8.
[4] πλείω δὴ conj. Sch.; πιώδη UMVAld.; πλείονα U ?.
[5] *cf.* 3. 10. 4.
[6] συμμεμυκότα κατὰ τοῦ μ.: G evidently had a different text; ? συμπεφυκότα W.

occurs in the autumn after the shedding of the leaves, and has from the first a glistening look,[1] as though swelling had taken place, just as if it were about to burst into leaves; and it persists through the winter till the spring. The filbert after casting its fruit produces[2] its clustering growth,[3] which is as large as a good-sized grub: several[4] of these grow from one stalk, and some call them catkins. Each of these is made up of small processes arranged like scales, and resembles the cone of the fir, so that its appearance is not unlike that of a young green fir-cone, except that it is longer and almost of the same thickness throughout. This grows through the winter (when spring comes, the scale-like processes open and turn yellow); it grows to the length of three fingers, but, when in spring the leaves are shooting, it falls off, and the cup-like[5] fruit-cases of the nut are formed, closed all down[6] the stalk and corresponding[7] in number to the flowers; and in each of these is a single nut. The case of the lime and of any other tree that produces winter-buds needs further consideration.

Of the comparative rate of growth in trees, and of the length of their roots.

VI. Some trees are quick-growing, some slow. Quick-growing are those which grow by the waterside, as elm plane abele black poplar willow; (however some dispute about the last-named, and consider it a slow grower:) and of fruit-bearing trees, silver-fir fir oak. Quickest growing of all are . . .[8] yew *lakara*

[7] ὅσα καὶ ἦν τὰ ἄνθη conj. W.; ὅσα καὶ κατὰ ἄνθη Ald.

[8] Lacuna in text (Sch. W.). The following list of trees also appears to be in confusion, and includes some of both classes.

καὶ λάκαρα φηγὸς ἄρκευθος σφένδαμνος ὀστρύα ζυγία μελία κλήθρα πίτυς ἀνδράχλη κρανεία πύξος ἀχράς. καρποφορεῖ δ' εὐθὺς ἐλάτη πεύκη πίτυς, κἂν ὀπηλικονοῦν μέγεθος λάβωσιν.

2 Ἡ δὲ αὔξησις καὶ ἡ βλάστησις τῶν μὲν ἄλλων ἄτακτος κατὰ τοὺς τόπους τῶν βλαστῶν, τῆς δ' ἐλάτης ὡρισμένη καὶ συνεχὴς καὶ ὕστερον. ὅταν γὰρ ἐκ τοῦ στελέχους τὰ πρῶτα σχισθῇ, πάλιν ἐξ ἐκείνου ἡ ἑτέρα σχίσις γίνεται κατὰ τὸν αὐτὸν τρόπον, καὶ τοῦτ' ἀεὶ ποιεῖ κατὰ πάσας τὰς ἐπιβλαστήσεις. ἐν δὲ τοῖς ἄλλοις οὐδ' οἱ ὄζοι κατ' ἀλλήλους πλὴν ἐπί τινων ὀλίγων, οἷον κοτίνου καὶ ἄλλων· ἔχει δὲ καὶ τῇδε διαφορὰν ἡ αὔξησις κοινῇ πάντων ὁμοίως ἡμέρων τε καὶ ἀγρίων· τὰ μὲν γὰρ καὶ ἐκ τοῦ ἄκρου τῶν βλαστῶν καὶ ἐκ τῶν πλαγίων φύεται, καθάπερ ἄπιος ῥόα συκῆ μύρρινος σχεδὸν τὰ πλεῖστα· τὰ δ' ἐκ τοῦ ἄκρου μὲν οὐκ ἀνίησιν ἐκ δὲ τῶν πλαγίων, καὶ αὐτὸ προωθεῖται τὸ ὑπάρχον, ὥσπερ καὶ τὸ ὅλον στέλεχος καὶ οἱ ἀκρεμόνες. συμβαίνει δὲ τοῦτο ἐπὶ τῆς Περσικῆς καρύας καὶ τῆς Ἡρακλεωτικῆς καὶ
3 ἄλλων. ἁπάντων δὲ τῶν τοιούτων εἰς ἓν φύλλον ἀποτελευτῶσιν οἱ βλαστοί, δι' ὃ καὶ εὐλόγως οὐκ ἐπιβλαστάνει καὶ αὐξάνεται μὴ ἔχοντα ἀρχήν. (ὁμοία δὲ τρόπον τινὰ ἡ αὔξησις καὶ τοῦ σίτου·

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[1] κατὰ . . . βλαστῶν conj. W.; κατὰ τοὺς τρόπους (corrected to τόπους) καὶ βλαστούς U; MVP insert τοὺς before βλαστούς.

[2] ἐκείνου . . . κατὰ conj. W.; ἐκείνου ἡ ἑτέρα σχίζεται τὰ ἴσα καὶ UAld.

[3] ἄλλων : ? ἐλάας W.; I suggest ἄλλων ἐλαῶν.

(bird-cherry) Valonia oak Phoenician cedar maple hop-hornbeam *zygia* manna-ash alder Aleppo pine andrachne cornelian cherry box wild pear. But silver-fir fir and Aleppo pine bear fruit from the very first, whatever size they have attained.

While the growth and budding of most trees are irregular as regards the position in which the buds appear,[1] the growth and budding of the silver-fir follow a regular rule, and its development afterwards is also in a regular sequence. For, when the trunk first divides, then again from the divided trunk the second division[2] takes place in like manner, and so the tree goes on with each fresh formation of buds. In other trees not even the knots are opposite to one another, except in some few cases, as wild olive and others.[3] Here too we find a difference in the manner of growth which belongs to all trees alike, both cultivated and wild: in some cases the growth is from the top of the shoots and also from the side-buds,[4] as in pear pomegranate fig myrtle and the majority of trees, one may say: in some cases the growth is not from the top, but only from the side-buds, and the already existing part is pushed out[5] further, as is the whole trunk with the upper branches. This occurs in the walnut and in the filbert as well as in other trees. In all such trees the buds end in a single leaf[6]; wherefore it is reasonable that they should not make fresh buds and growth from this point, as they have no point of departure. (To a certain extent the growth of corn is similar; for it

[4] *ἐκ τοῦ . . . πλαγίων*: ? *ἐκ τοῦ ἄκρου καὶ ἐκ τῶν πλαγίων βλαστῶν*. *cf.* 3. 5. 1.

[5] *i.e.* grows without dividing. *cf.* Plin. 16. 100. (of different trees).

[6] *φύλλον* perhaps conceals some other word.

καὶ γὰρ οὗτος ἀεὶ τῇ προώσει τοῦ ὑπάρχοντος αὐξάνεται, κἂν κολοβωθῇ τὰ φύλλα, καθάπερ ἐν τοῖς ἐπιβοσκομένοις· πλὴν οὗτός γε οὐκ ἐκ τοῦ πλαγίου παραφύει, καθάπερ ἔνια τῶν χεδροπῶν.) αὕτη μὲν οὖν διαφορά τις ἂν εἴη βλαστήσεως ἅμα καὶ αὐξήσεως.

4 Βαθύρριζα δὲ οὔ φασί τινες εἶναι τὰ ἄγρια διὰ τὸ φύεσθαι πάντα ἀπὸ σπέρματος, οὐκ ἄγαν ὀρθῶς λέγοντες. ἐνδέχεται γὰρ ὅταν ἐμβιώσῃ πόρρω καθιέναι τὰς ῥίζας· ἐπεὶ καὶ τῶν λαχάνων τὰ πολλὰ τοῦτο ποιεῖ, καίπερ ἀσθενέστερα ὄντα καὶ ἐναργῶς φυόμενα <ἐν> τῇ γῇ. βαθυρριζότατον δ' οὖν δοκεῖ τῶν ἀγρίων εἶναι ἡ πρῖνος· ἐλάτη δὲ καὶ πεύκη μετρίως, ἐπιπολαιότατον δὲ θραύπαλος καὶ κοκκυμηλέα καὶ σποδιάς· αὕτη δ' ἐστὶν ὥσπερ ἀγρία κοκκυμηλέα. ταῦτα μὲν οὖν καὶ ὀλιγόρριζα· ὁ δὲ θραύπαλος πολύρριζον. συμβαίνει δὲ τοῖς ἄλλοις τοῖς μὴ κατὰ βάθους ἔχουσι, καὶ οὐχ ἥκιστα ἐλάτῃ καὶ πεύκῃ, προρρίζοις ὑπὸ τῶν πνευμάτων ἐκπίπτειν.

5 Οἱ μὲν οὖν περὶ Ἀρκαδίαν οὕτω λέγουσιν. οἱ δ' ἐκ τῆς Ἴδης βαθυρριζότερον ἐλάτην δρυὸς ἀλλ' ἐλάττους ἔχειν καὶ εὐθυρριζοτέραν εἶναι· βαθυρριζότατον δὲ καὶ τὴν κοκκυμηλέαν καὶ τὴν Ἡρακλεωτικήν, τὰς δὲ ῥίζας λεπτὰς καὶ ἰσχυρὰς τὴν Ἡρακλεωτικήν, τὴν δὲ κοκκυμηλέαν πολύρριζον, ἄμφω δ' ἐμβιῶναι δεῖν· δυσώλεθρον δὲ τὴν κοκκυμηλέαν. ἐπιπολῆς δὲ σφένδαμνον καὶ

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[1] τοῦ ὑπάρχοντος conj. Sch. from G ; τῇ ὑπαρχούσῃ Ald.
[2] οὐδ' : ? οὐκ W. [3] Plin. 16. 127.
[4] ἐμβιώσῃ : *cf.* 3. 6. 5 ; *C.P.* 1. 2. 1.

also regularly increases by pushing forward of the already existing part,[1] even if the leaves are mutilated, as in corn which is bitten down by animals. Corn however does not[2] make side-growths, as some leguminous plants do.) Here then we may find a difference which occurs both in the making of buds and in the making of fresh growth.

[3] Some say that wild trees are not deep rooting, because they all grow from seed; but this is not a very accurate statement. For it is possible that, when they are well established,[4] they may send their roots down far; in fact even most pot-herbs do this, though these are not so strong as trees, and are undoubtedly grown from seed planted in the ground.[5] The kermes-oak however seems to be the deepest rooting of wild trees; silver-fir and fir are only moderately so, and shallowest are joint-fir plum bullace (which is a sort of wild plum). The last two also have few roots, while joint-fir has many. Trees which do not root deep,[6] and especially silver-fir and fir, are liable to be rooted up by winds.

So the Arcadians say. But the people who live near Mount Ida say that the silver fir is deeper rooting[7] than the oak,[8] and has straighter roots, though they are fewer. Also that those which have the deepest roots are plum and filbert, the latter having strong slender roots, the former having many: but they add that both trees must be well established to acquire these characters; also that plum is very tenacious of life. Maple, they say,

[5] *ἐναργῶς . . . γῇ*: so G; *ἐν* add. W.
[6] *βάθους* conj. Sch.; *βάθος* Ald.
[7] *βαθορριζότερον* conj. W.; *βαθυρριζότατον* UMVAld.
[8] Proverbial for its hold on the ground; *cf.* Verg. *Aen.* 4. 441 foll.

ὀλίγας· τὴν δὲ μελίαν πλείους καὶ εἶναι πυκνόρριζον καὶ βαθύρριζον. ἐπιπολῆς δὲ καὶ ἄρκευθον καὶ κέδρον· καὶ κλήθρας λεπτὰς καὶ ὁμαλεῖς· ἔτι δ' ὀξύην· καὶ γὰρ τοῦτ' ἐπιπολαιόρριζον καὶ ὀλιγόρριζον. τὴν δὲ οὔαν ἐπιπολαίους μὲν ἰσχυρὰς δὲ καὶ παχείας καὶ δυσωλέθρους πλήθει δὲ μετρίας. βαθύρριζα μὲν οὖν καὶ οὐ βαθύρριζα τὰ τοιαῦτ' ἐστίν.

VII. Ἀποκοπέντος δὲ τοῦ στελέχους τὰ μὲν ἄλλα πάνθ' ὡς εἰπεῖν παραβλαστάνει, πλὴν ἐὰν αἱ ῥίζαι πρότερον τύχωσι πεπονηκυῖαι· πεύκη δὲ καὶ ἐλάτη τελέως ἐκ ῥιζῶν αὐτοετεῖς αὐαίνονται καὶ ἐὰν τὸ ἄκρον ἐπικοπῇ. συμβαίνει δὲ ἴδιόν τι περὶ τὴν ἐλάτην· ὅταν γὰρ κοπῇ ἢ κολουσθῇ ὑπὸ πνεύματος ἢ καὶ ἄλλου τινὸς περὶ τὸ λεῖον τοῦ στελέχους—ἔχει γὰρ μέχρι τινὸς λεῖον καὶ ἄοζον καὶ ὁμαλὸν ἱκανὸν ἵστῳ πλοίου—περιφύεται μικρόν, ὑποδεέστερον εἰς ὕψος, καὶ καλοῦσιν οἱ μὲν ἄμφαυξιν οἱ δὲ ἀμφίφυαν, τῷ μὲν χρώματι μέλαν τῇ δὲ σκληρότητι ὑπερβάλλον, ἐξ οὗ τοὺς κρατῆρας ποιοῦσιν οἱ περὶ Ἀρκαδίαν·
2 τὸ δὲ πάχος οἷον ἂν τύχῃ τὸ δένδρον, ὅσῳπερ ἂν ἰσχυρότερον καὶ ἐγχυλότερον ἢ παχύτερον. συμβαίνει δὲ κἀκεῖνο ἴδιον ἐν ταὐτῷ τούτῳ περὶ

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[1] *σφ. καὶ ὀλίγας* conj. W.; *σφ. κατ' ὀλίγον* UMVAld.
[2] *i.e.* not very fibrous.
[3] *cf.* Hdt. 6. 37, and the proverb *πίτνος τρόπον ἐκτρίβεσθαι.*
[4] *ὅμαλον* conj. Scal.; *ὅμοιον* Ald.
[5] *ἱκανὸν ἵστῳ πλοίου* conj. W.; *ἢ καὶ ἡλίκον πλεῖον* Ald.; so UH, but with *πλοῖον.*

has shallow roots and few of them[1]; but manna-ash has more and they are thickly matted and run deep; Phoenician cedar and prickly cedar, they say, have shallow roots, those of alder are slender and 'plain,'[2] as also are those of beech; for this too has few roots, and they are near the surface. Sorb, they say, has its roots near the surface, but they are strong and thick and hard to kill, though not very numerous. Such are the trees which are or are not deep-rooting.

Of the effects of cutting down the whole or part of a tree.

VII. Almost all trees shoot from the side if the trunk is cut down, unless the roots have previously been injured; but fir and silver-fir wither away[3] completely from the roots within the year, if merely the top has been cut off. And there is a peculiar thing about the silver-fir; when it is topped or broken off short by wind or some other cause affecting the smooth part of the trunk—for up to a certain height the trunk is smooth knotless and plain[4] (and so suitable for making a ship's mast[5]),—a certain amount of new growth forms round it, which does not however grow much vertically; and this is called by some *amphauxis*[6] and by others *amphiphya*[6]; it is black in colour and exceedingly hard, and the Arcadians make their mixing-bowls out of it; the thickness is in proportion[7] to the tree, according as that is more or less vigorous and sappy, or again according to its thickness. There[8] is this peculiarity too in the silver-fir in the same connexion;

[6] Two words meaning 'growth about,' *i.e. callus*.
[7] οἷον ἂν conj. W.; οἷον ἐὰν Ald.; ὅσον ἂν conj. Scal.
[8] Plin. 16. 123.

τὴν ἐλάτην· ὅταν μὲν γάρ τις τοὺς ὄζους ἅπαντας ἀφελὼν ἀποκόψῃ τὸ ἄκρον, ἀποθνήσκει ταχέως· ὅταν δὲ τὰ κατωτέρω τὰ κατὰ τὸ λεῖον ἀφέλῃ, ζῇ τὸ κατάλοιπον, περὶ ὃ δὴ καὶ ἡ ἄμφαυξις φύεται. ζῇ δὲ δῆλον ὅτι τῷ ἔγχυλον εἶναι καὶ χλωρόν, εἴπερ ἀπαράβλαστον. ἀλλὰ γὰρ τοῦτο μὲν ἴδιον τῆς ἐλάτης.

3 Φέρει δὲ τὰ μὲν ἄλλα τόν τε καρπὸν τὸν ἑαυτῶν καὶ τὰ κατ' ἐνιαυτὸν ἐπιγινόμενα ταῦτα, φύλλον ἄνθος βλαστόν· τὰ δὲ καὶ βρύον ἢ ἕλικα· τὰ δὲ πλείω, καθάπερ ἥ τε πτελέα τόν τε βότρυν καὶ τὸ θυλακῶδες τοῦτο, καὶ συκῆ καὶ τὰ ἐρινὰ τὰ προαποπίπτοντα καὶ εἴ τινες ἄρα τῶν συκῶν ὀλυνθοφοροῦσιν· ἴσως δὲ τρόπον τινὰ καρπὸς οὗτος. ἀλλ' ἡ Ἡρακλεωτικὴ καρύα τὸν ἴουλον καὶ ἡ πρῖνος τὸν φοινικοῦν κόκκον ἡ δὲ δάφνη τὸ βότρυον. φέρει μὲν καὶ ἡ καρποφόρος, εἰ μὴ καὶ πᾶσα ἀλλά τοι γένος τι αὐτῆς, οὐ μὴν ἀλλὰ πλέον ἡ ἄκαρπος, ἣν δὴ καὶ ἄρρενά τινες καλοῦσιν. ἀλλ' ἡ πεύκη τὸν προαποπίπτοντα κύτταρον.

4 Πλεῖστα δὲ πάντων ἡ δρῦς παρὰ τὸν καρπόν, οἷον τήν τε κηκίδα τὴν μικρὰν καὶ τὴν ἑτέραν

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[1] *i.e.* and so does not, like other trees under like treatment, put its strength into these. *cf. C.P.* 5. 17. 4.

[2] ἑαυτῶν conj. Sch. from G; αὐτὸν Ald.

[3] The leaf-gall, *cf.* 2. 8. 3; 3. 14. 1. For τοῦτο *cf.* 3. 18. 11; 4. 7. 1.

[4] Lat. *grossi*. *cf. C.P.* 5. 1. 8.

[5] τινὰ καρπὸς conj. Sch.; τινὰ ἄκαρπος UAld.

when, after taking off all the branches, one cuts off the top, it soon dies; yet, when one takes off the lower parts, those about the smooth portion of the trunk, what is left survives, and it is on this part that the *amphauxis* forms. And plainly the reason why the tree survives is that it is sappy and green because it has no side-growths.[1] Now this is peculiar to the silver-fir.

Of other things borne by trees besides their leaves flowers and fruit.

Now, while other trees bear merely their own[2] fruit and the obvious parts which form annually, to wit, leaf flower and bud, some bear also catkins or tendrils, and some produce other things as well, for instance the elm its 'cluster' and the familiar bag-like thing,[3] the fig both the immature figs which drop off and (in some kinds) the untimely figs[4]—though perhaps in a sense[5] these should be reckoned as fruit. Again filbert produces its catkin,[6] kermes-oak its scarlet 'berry,'[7] and bay its 'cluster.'[8] The fruit-bearing sort of bay also produces this, or at all events[9] one kind certainly does so; however the sterile kind, which some call the 'male,' produces it in greater quantity. The fir again bears its 'tuft,'[10] which drops off.

[11] The oak however bears more things besides[12] its fruit than any other tree; as the small gall[13] and its

[6] *cf.* 3. 3. 8; 3. 5. 5.
[7] *cf.* 3. 16. 1. *i.e.* the kermes gall (whence Eng. 'crimson').
[8] *βότρυον* UMVAld., supported by G. and Plin. 16. 120; but some editors read *βρύον* on the strength of 3. 11. 4. and *C.P.* 2. 11. 4.
[9] *ἀλλά τοι* conj. W.; *ἀλλὰ καὶ* Ald.
[10] *cf.* 3. 3. 8 n.
[11] Plin. 16. 28.
[12] *παρὰ* conj. W., *cf.* § 6; *φέρει* Ald.
[13] *cf.* 3. 5. 2.

τὴν πιττώδη μέλαιναν. ἔτι δὲ συκαμινῶδες ἄλλο τῇ μορφῇ πλὴν σκληρὸν καὶ δυσκάτακτον, σπάνιον δὲ τοῦτο· καὶ ἕτερον αἰδοιώδη σχέσιν ἔχον, τελειούμενον δ' ἔτι σκληρὸν κατὰ τὴν ἐπανάστασιν καὶ τετρυπημένον· προσεμφερὲς τρόπον τινὰ τοῦτ' ἐστὶ καὶ ταύρου κεφαλῇ, περικαταγνύμενον δὲ ἔνδοθεν ἔχει πυρῆνος ἐλάας ἰσοφυές. φύει δὲ καὶ τὸν ὑπ' ἐνίων καλούμενον πῖλον· τοῦτο δ' ἐστὶ σφαιρίον ἐριῶδες μαλακὸν περὶ πυρήνιον σκληρότερον πεφυκός, ᾧ χρῶνται πρὸς τοὺς λύχνους· καίεται γὰρ καλῶς, ὥσπερ καὶ ἡ μέλαινα κηκίς. φύει δὲ καὶ ἕτερον σφαιρίον κόμην ἔχον, τὰ μὲν ἄλλα ἀχρεῖον, κατὰ δὲ τὴν ἐαρινὴν ὥραν ἐπίβαπτον χυλῷ μελιτηρῷ καὶ κατὰ τὴν ἀφὴν καὶ κατὰ τὴν γεῦσιν.

5 Παραφύει δ' ἐνδοτέρω τῆς τῶν ῥαβδῶν μασχαλίδος ἕτερον σφαιρίον ἄμισχον ἢ καὶ κοιλόμισχον ἴδιον καὶ ποικίλον· τοὺς μὲν γὰρ ἐπανεστηκότας ὀμφαλοὺς ἐπιλεύκους ἢ ἐπεστιγμένους ἔχει μέλανας τὸ δ' ἀνὰ μέσον κοκκοβαφὲς καὶ λαμπρόν· ἀνοιγόμενον δ' ἐστὶ μέλαν καὶ ἐπίσαπρον. σπάνιον δὲ παραφύει καὶ λιθάριον κισσηροειδὲς ἐπὶ πλεῖον. ἔτι δ' ἄλλο τούτου σπανιαίτερον φυλλικὸν συμπεπιλημένον πρόμηκες σφαιρίον. ἐπὶ δὲ τοῦ φύλλου φύει κατὰ τὴν ῥάχιν σφαιρίον λευκὸν διαυγὲς ὑδατῶδες, ὅταν ἁπαλὸν ᾖ· τοῦτο δὲ καὶ

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[1] πυρῆνος ἐλάας ἰσοφυὲς conj. W.; πυρῆνος ἐλαίᾳ εἰρουφυην UMV; πυρῆνα ἐλαία εἰρουφύην Ald.

[2] περὶ πυρήνιον σκληρότερον I conj.; περὶ πυρηνίου σκληρότητα U; περὶ πυρηνίου σκληρότερον M; περιπυρηνίου σκληρότερον VAld. W. prints the reading of U. For πῖλος see Index.

other black resinous gall. Again it has another growth, like a mulberry in shape, but hard and difficult to break; this however is not common. It has also another growth like the *penis* in shape, which, when it is further developed, makes a hard prominence and has a hole through it. This to a certain extent resembles also a bull's head, but, when split open, it contains inside a thing shaped like the stone of an olive.[1] The oak also produces what some call the 'ball'; this is a soft woolly spherical object enclosing a small stone which is harder,[2] and men use it for their lamps; for it burns well, as does the black gall. The oak also produces another hairy ball, which is generally useless, but in the spring season it is covered with a juice which is like honey both to touch and taste.

[3] Further the oak produces right inside the axil[4] of the branches another ball with no stalk or else[5] a hollow one; this is peculiar and of various colours: for the knobs which arise on it are whitish or black and spotted,[6] while the part between these is brilliant scarlet; but, when it is opened, it is black and rotten.[7] It also occasionally produces a small stone which more or less resembles pumice-stone; also, less commonly, there is a leaf-like ball, which is oblong and of close texture. Further the oak produces on the rib of the leaf a white transparent ball, which is watery, when it is young; and this sometimes con-

[1] Plin. 16. 29.

[2] *ἐνδοτέρω . . . μασχαλίδος* conj. R. Const.; *ἐντεριώνης τῶν ῥοπῶν μασχαλίδας* UAld. Plin., *l.c.*, *gignunt et alae ramorum eius pilulas.* [5] *ἢ* ins. St.

[6] Plin., *l.c.*, *nigra varietate dispersa.*

[7] *ἐπίσαπρον*; Plin., *l.c.*, has *apertis amara inanitas est*, whence *ἐπίπικρον* conj. Sch.

μύας ἐνίοτε ἐνδὸν ἴσχει. τελειούμενον δὲ σκληρύνεται κηκίδος μικρᾶς λείας τρόπον.

6 Ἡ μὲν οὖν δρῦς τοσαῦτα φέρει παρὰ τὸν καρπόν. οἱ γὰρ μύκητες ἀπὸ τῶν ῥιζῶν καὶ παρὰ τὰς ῥίζας φυόμενοι κοινοὶ καὶ ἑτέρων εἰσίν. ὡσαύτως δὲ καὶ ἡ ἰξία· καὶ γὰρ αὕτη φύεται καὶ ἐν ἄλλοις· ἀλλ' οὐδὲν ἧττον, ὥσπερ ἐλέχθη, πλειστοφόρον ἐστίν· εἰ δέ γε δὴ καθ' Ἡσίοδον φέρει μέλι καὶ μελίττας, ἔτι μᾶλλον· φαίνεται δ' οὖν καὶ ὁ μελιτώδης οὗτος χυλὸς ἐκ τοῦ ἀέρος ἐπὶ ταύτῃ μάλιστα προσίζειν. φασὶ δὲ καὶ ὅταν κατακαυθῇ γίνεσθαι λίτρον ἐξ αὐτῆς. ταῦτα μὲν οὖν ἴδια τῆς δρυός.

VIII. Πάντων δέ, ὥσπερ ἐλέχθη, τῶν δένδρων ὡς καθ' ἕκαστον γένος λαβεῖν διαφοραὶ πλείους εἰσίν· ἡ μὲν κοινὴ πᾶσιν, ᾗ διαιροῦσι τὸ θῆλυ καὶ τὸ ἄρρεν, ὧν τὸ μὲν καρποφόρον τὸ δὲ ἄκαρπον ἐπί τινων. ἐν οἷς δὲ ἄμφω καρποφόρα τὸ θῆλυ καλλικαρπότερον καὶ πολυκαρπότερον· πλὴν ὅσοι ταῦτα καλοῦσιν ἄρρενα, καλοῦσι γάρ τινες. παραπλησία δ' ἡ τοιαύτη διαφορὰ καὶ ὡς τὸ ἥμερον διῄρηται πρὸς τὸ ἄγριον. ἑτέρα δὲ κατ' εἶδος αὐτῶν τῶν ὁμογενῶν· ὑπὲρ ὧν λεκτέον ἅμα συνεμφαίνοντας καὶ τὰς ἰδίας μορφὰς τῶν μὴ φανερῶν καὶ γνωρίμων.

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[1] Plin. 16. 31.
[2] Hes. *Op.* 233.
[3] Plin. 16. 16.
[4] λεκτέον add. Sch.

tains flies: but as it develops, it becomes hard, like a small smooth gall.

Such are the growths which the oak produces as well as its fruit. For as for the fungi[1] which grow from the roots or beside them, these occur also in other trees. So too with the oak-mistletoe; for this grows on other trees also. However, apart from that, the oak, as was said, produces more things than any other tree; and all the more so if, as Hesiod[2] says, it produces honey and even bees; however, the truth appears to be that this honey-like juice comes from the air and settles on this more than on other trees. They say also that, when the oak is burnt, nitre is produced from it. Such are the things peculiar to the oak.

Of 'male' and 'female' in trees: the oak as an example of this and other differences.

VIII. [3]Taking, as was said, all trees according to their kinds, we find a number of differences. Common to them all is that by which men distinguish the 'male' and the 'female,' the latter being fruit-bearing, the former barren in some kinds. In those kinds in which both forms are fruit-bearing the 'female' has fairer and more abundant fruit; however some call these the 'male' trees—for there are those who actually thus invert the names. This difference is of the same character as that which distinguishes the cultivated from the wild tree, while other differences distinguish different forms of the same kind; and these we must discuss,[4] at the same time indicating the peculiar forms, where these are not[5] obvious and easy to recognise.

[5] μὴ conj. St.; μήτε Ald.H.

2 Δρυὸς δὴ γένη—ταύτην γὰρ μάλιστα διαιροῦσι· καὶ ἔνιοί γε εὐθὺς τὴν μὲν ἥμερον καλοῦσι τὴν δ' ἀγρίαν οὐ τῇ γλυκύτητι τοῦ καρποῦ διαιροῦντες· ἐπεὶ γλυκύτατός γε ὁ τῆς φηγοῦ, ταύτην δ' ἀγρίαν ποιοῦσιν· ἀλλὰ τῷ μᾶλλον ἐν τοῖς ἐργασίμοις φύεσθαι καὶ τὸ ξύλον ἔχειν λειότερον, τὴν δὲ φηγὸν τραχὺ καὶ ἐν τοῖς ὀρεινοῖς—γένη μὲν οὖν οἱ μὲν τέτταρα ποιοῦσιν οἱ δὲ πέντε. διαλλάττουσι δ' ἔνια τοῖς ὀνόμασιν, οἷον τὴν τὰς γλυκείας φέρουσαν οἱ μὲν ἡμερίδα καλοῦντες οἱ δ' ἐτυμόδρυν. ὁμοίως δὲ καὶ ἐπ' ἄλλων. ὡς δ' οὖν οἱ περὶ τὴν Ἴδην διαιροῦσι, τάδ' ἐστὶ τὰ εἴδη· ἡμερὶς αἰγίλωψ πλατύφυλλος φηγὸς ἁλίφλοιος· οἱ δὲ εὐθύφλοιον καλοῦσιν. κάρπιμα μὲν πάντα· γλυκύτατα δὲ τὰ τῆς φηγοῦ, καθάπερ εἴρηται, καὶ δεύτερον τὰ τῆς ἡμερίδος, ἔπειτα τῆς πλατυφύλλου, καὶ τέταρτον ἡ ἁλίφλοιος, ἔσχατον δὲ
3 καὶ πικρότατον ἡ αἰγίλωψ. οὐχ ἅπασαι δὲ γλυκεῖαι ἐν τοῖς γένεσιν ἀλλ' ἐνίοτε καὶ πικραί, καθάπερ ἡ φηγός. διαφέρουσι δὲ καὶ τοῖς μεγέθεσι καὶ τοῖς σχήμασι καὶ τοῖς χρώμασι τῶν βαλάνων. ἴδιον δὲ ἔχουσιν ἥ τε φηγὸς καὶ ἡ ἁλίφλοιος· ἀμφότεραι γὰρ παραλιθάζουσιν ἐν τοῖς ἄρρεσι καλουμένοις ἐξ ἄκρων τῶν βαλάνων ἑκατέρωθεν, αἱ μὲν πρὸς τῷ κελύφει αἱ δὲ πρὸς

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[1] Plin. 16. 16 and 17.
[2] See Index, δρῦς and ἡμερίς. ἡμερίς, lit. 'cultivated oak.'
[3] Plin. 16. 20.

[1] Take then the various kinds of oak; for in this tree men recognise more differences than in any other. Some simply speak of a cultivated and a wild kind, not recognising any distinction made by the sweetness of the fruit; (for sweetest is that of the kind called Valonia oak, and this they make the wild kind), but distinguishing the cultivated kind by its growing more commonly on tilled land and having smoother timber, while the Valonia oak has rough wood and grows in mountain districts. Thus some make four kinds, others five. They also in some cases vary as to the names assigned; thus the kind which bears sweet fruit is called by some *hemeris*, by others 'true oak.' So too with other kinds. However, to take the classification given by the people of Mount Ida, these [2] are the kinds: *hemeris* (gall-oak), *aigilops* (Turkey-oak), 'broad-leaved' oak (scrub oak), Valonia oak, sea-bark oak, which some call 'straight-barked' oak. [3] All these bear fruit; but the fruits of Valonia oak are the sweetest, as has been said; second to these those of *hemeris* (gall-oak), third those of the 'broad-leaved' oak (scrub oak), fourth sea-bark oak, and last *aigilops* (Turkey-oak), whose fruits are very bitter. [4] However the fruit is not always sweet in the kinds specified as such [5]; sometimes it is bitter, that of the Valonia oak for instance. There are also differences in the size shape and colour of the acorns. Those of Valonia oak and sea-bark oak are peculiar; in both of these kinds on what are called the 'male' trees the acorns become stony at one end or the other; in one kind this hardening takes place in the end which is

[4] Plin. 16. 19-21.

[5] οὐχ . . . ἐνίοτε conj. W.; text defective in Ald.H.

αὐτῇ τῇ σαρκί. δι' ὃ καὶ ἀφαιρεθέντων ὅμοια γίνεται κοιλώματα τοῖς ἐπὶ τῶν ζώων.

4 Διαφέρουσι δὲ καὶ τοῖς φύλλοις καὶ τοῖς στελέχεσι καὶ τοῖς ξύλοις καὶ τῇ ὅλῃ μορφῇ. ἡ μὲν γὰρ ἡμερὶς οὐκ ὀρθοφυὴς οὐδὲ λεία οὐδὲ μακρά· περίκομος γὰρ ἡ φυτεία καὶ ἐπεστραμμένη καὶ πολυμάσχαλος, ὥστε ὀζώδη καὶ βραχεῖαν γίνεσθαι· τὸ δὲ ξύλον ἰσχυρὸν μὲν ἀσθενέστερον δὲ τῆς φηγοῦ· τοῦτο γὰρ ἰσχυρότατον καὶ ἀσαπέστατον. οὐκ ὀρθοφυὴς δὲ οὐδ' αὕτη ἀλλ' ἧττον ἔτι τῆς ἡμερίδος, τὸ δὲ στέλεχος παχύτατον, ὥστε καὶ τὴν ὅλην μορφὴν βραχεῖαν εἶναι· καὶ γὰρ ἡ φυτεία περίκομος καὶ ταύτῃ καὶ οὐκ εἰς ὀρθόν. ἡ δὲ αἰγίλωψ ὀρθοφυέστατον καὶ ὑψηλότατον καὶ λειότατον καὶ τὸ ξύλον εἰς μῆκος ἰσχυρότατον. οὐ φύεται δὲ ἐν τοῖς ἐργασίμοις ἢ σπανίως.

5 Ἡ δὲ πλατύφυλλος δεύτερον ὀρθοφυΐᾳ καὶ μήκει, πρὸς δὲ τὴν χρείαν τὴν οἰκοδομικὴν χείριστον μετὰ τὴν ἀλίφλοιον, φαῦλον δὲ καὶ εἰς τὸ καίειν καὶ ἀνθρακεύειν, ὥσπερ καὶ τὸ τῆς ἀλιφλοίου, καὶ θριπηδέστατον μετ' ἐκείνην· ἡ γὰρ ἀλίφλοιος παχὺ μὲν ἔχει τὸ στέλεχος χαῦνον δὲ καὶ κοῖλον ἐὰν ἔχῃ πάχος ὡς ἐπὶ τὸ πολύ, δι' ὃ καὶ ἀχρεῖον εἰς τὰς οἰκοδομάς· ἔτι δὲ σήπεται τάχιστα· καὶ γὰρ ἔνυγρόν ἐστι τὸ δένδρον· δι' ὃ καὶ κοίλη γίνεται. φασὶ δέ τινες οὐδ' ἐγκάρδιον εἶναι μόνῃ. λέγουσιν ὡς καὶ κεραυνοβλῆτες αὗται μόναι γίνονται καίπερ ὕψος οὐκ ἔχουσαι

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[1] *i.e.* at the 'top' end ; πρὸς : ? ἐν, πρὸς being repeated by mistake.

[2] ζώων MSS.; ὠῶν conj. Palm. [3] Plin. 16. 22.

attached to the cup, in the other in the flesh itself.[1] Wherefore, when the cups are taken off, we find a cavity like the visceral cavities in animals.[2]

[3] There are also differences in leaves trunk timber and general appearance. *Hemeris* (gall-oak) is not straight-growing nor smooth nor tall, for its growth is very leafy [4] and twisted, with many side-branches, so that it makes a low much-branched tree: its timber is strong, but not so strong as that of the Valonia oak, for that is the strongest and the least liable to rot. This [5] kind too is not straight-growing, even less so than the *hemeris* (gall-oak), but the trunk is very thick, so that the whole appearance is stunted; for in growth this kind too is very leafy [4] and not erect. The *aigilops* (Turkey oak) is the straightest growing and also the tallest and smoothest, and its wood, cut lengthways, is the strongest. It does not grow on tilled land, or very rarely.

The 'broad-leaved' oak (scrub oak) [6] comes second as to straightness of growth and length of timber to be got from it, but for use in building it is the worst next after the sea-bark oak, and it is even poor wood for burning and making charcoal, as is also that of the sea-bark oak, and next after this kind it is the most worm-eaten. For the sea-bark oak has a thick trunk, but it is generally spongy and hollow when it is thick; wherefore it is useless for building. Moreover it rots very quickly, for the tree contains much moisture; and that is why it also becomes hollow; and some say that it is the only [7] oak which has no heart. And some of the Aeolians say that these are the only oaks which are struck by light-

[4] *i.e.* of bushy habit.
[5] *αὕτη* conj. Sch.: *αὐτὴ* UAld.
[6] Plin. 16. 23 and 24.
[7] *μόνῃ* conj. St.; *μόνην* Ald. H.

τῶν Λιολέων τινές, οὐδὲ πρὸς τὰ ἱερὰ χρῶνται τοῖς ξύλοις. κατὰ μὲν οὖν τὰ ξύλα καὶ τὰς ὅλας μορφὰς ἐν τούτοις αἱ διαφοραί.

6 Κηκίδας δὲ πάντα φέρει τὰ γένη, μόνη δὲ εἰς τὰ δέρματα χρησίμην ἡ ἡμερίς. ἡ δὲ τῆς αἰγίλωπος καὶ τῆς πλατυφύλλου τῇ μὲν ὄψει παρομοία τῇ τῆς ἡμερίδος, πλὴν λειοτέρα, ἀχρεῖος δέ. φέρει καὶ τὴν ἑτέραν τὴν μέλαιναν ᾗ τὰ ἔρια βάπτουσιν. ὃ δὲ καλοῦσί τινες φάσκον ὅμοιον τοῖς ῥακίοις ἡ αἰγίλωψ μόνη φέρει πολιὸν καὶ τραχύ· καὶ γὰρ πηχυαῖον κατακρεμάννυται, καθάπερ τρύχος ὀθονίου μακρόν. φύεται δὲ τοῦτο ἐκ τοῦ φλοιοῦ καὶ οὐκ ἐκ τῆς κορύνης ὅθεν ἡ βάλανος, οὐδ' ἐξ ὀφθαλμοῦ ἀλλ' ἐκ τοῦ πλαγίου τῶν ἄνωθεν ὄζων. ἡ δ' ἁλίφλοιος ἐπίμελαν τοῦτο φύει καὶ βραχύ.

7 Οἱ μὲν οὖν ἐκ τῆς Ἴδης οὕτως διαιροῦσιν. οἱ δὲ περὶ Μακεδονίαν τέτταρα γένη ποιοῦσιν, ἐτυμόδρυν ἢ τὰς γλυκείας, πλατύφυλλον ἢ τὰς πικράς, φηγὸν ἢ τὰς στρογγύλας, ἄσπριν· ταύτην δὲ οἱ μὲν ἄκαρπον ὅλως οἱ δὲ φαῦλον τὸν καρπόν, ὥστε μηδὲν ἐσθίειν ζῶον πλὴν ὑός, καὶ ταύτην ὅταν ἑτέραν μὴ ἔχῃ· καὶ τὰ πολλὰ λαμβάνεσθαι περικεφαλαίᾳ. μοχθηρὰ δὲ καὶ τὰ ξύλα· πελε-

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[1] Plin. 16. 26.

[2] *φάσκον . . . ῥακίοις* conj. Sch. (*ῥακίοις* Salm.) : *φάσκος ὅμοιος τοῖς βραχείοις* UP_2 ; *φάσκον ὁμοίως τοῖς βραγχίοις* Ald.H. Plin. 16. 33, *cf.* 12. 108 ; Diosc. 1. 20 ; Hesych. *s.v. φάσκος.*

[3] *τραχὺ* conj. W. ; *βραχὺ* UP. [4] *κορύνης. cf.* 3. 5. 1.

ning, although they are not lofty; nor do they use the wood for their sacrifices. Such then are the differences as to timber and general appearance.

[1] All the kinds produce galls, but only *hemeris* (gall-oak) produces one which is of use for tanning hides. That of *aigilops* (Turkey-oak) and that of the 'broad-leaved' oak (scrub oak) are in appearance like that of *hemeris* (gall-oak), but smoother and useless. This also produces the other gall, the black kind, with which they dye wool. The substance which some call tree-moss and which resembles rags[2] is borne only by the *aigilops* (Turkey-oak); it is grey and rough [3] and hangs down for a cubit's length, like a long shred of linen. This grows from the bark and not from the knob [4] whence the acorn starts; nor does it grow from an eye, but from the side of the upper boughs. The sea-bark oak also produces this, but it is blackish [5] and short.

Thus the people of Mount Ida distinguish. But the people of Macedonia make four kinds, 'true-oak,' or the oak which bears the sweet acorns, 'broad-leaved' oak (scrub oak), or that which bears the bitter ones, Valonia oak, or that which bears the round ones, and *aspris* [6] (Turkey-oak); [7] the last-named some say is altogether without fruit, some say it bears poor fruit, so that no animal eats it except the pig, and only he when he can get no others, and that after eating it the pig mostly gets an affection of the head.[8] The wood is also wretched; when hewn with the axe it is altogether

[5] *ἐπίμελαν τοῦτο φύει* conj. Scal.; *ἐπιμ. τοῦτο φύσει* U; *ἐπὶ μελίαν τοῦτο φύει* MVAld.

[6] See Index. [7] Plin. 16. 24.

[8] *περικεφαλαίᾳ*: apparently the name of a disease.

κηθέντα μὲν ὅλως ἀχρεῖα· καταρήγνυται γὰρ καὶ διαπίπτει· ἀπελέκητα δὲ βελτίω, δι' ὃ καὶ οὕτω χρῶνται. μοχθηρὰ δὲ καὶ εἰς καῦσιν καὶ εἰς ἀνθρακείαν· ἀχρεῖος γὰρ ὅλως ὁ ἄνθραξ διὰ τὸ πηδᾶν καὶ σπινθηρίζειν πλὴν τοῖς χαλκεῦσι. τούτοις δὲ χρησιμώτερος τῶν ἄλλων· διὰ γὰρ τὸ ἀποσβέννυσθαι, ὅταν παύσηται φυσώμενος, ὀλίγος ἀναλίσκεται. [τὸ δὲ τῆς ἁλιφλοίου χρήσιμον εἰς τοὺς ἄξονας μόνον καὶ τὰ τοιαῦτα.][2] δρυὸς μὲν οὖν ταύτας ποιοῦσι τὰς ἰδέας.

IX. Τῶν δὲ ἄλλων ἐλάττους· καὶ σχεδὸν τά γε πλεῖστα διαιροῦσι ἄρρενι καὶ θήλει, καθάπερ εἴρηται, πλὴν ὀλίγων ὧν ἐστι καὶ ἡ πεύκη· πεύκης γὰρ τὸ μὲν ἥμερον ποιοῦσι τὸ δ' ἄγριον, τῆς δ' ἀγρίας δύο γένη· καλοῦσι δὲ τὴν μὲν Ἰδαίαν τὴν δὲ παραλίαν· τούτων δὲ ὀρθοτέρα καὶ μακροτέρα καὶ τὸ φύλλον ἔχουσα παχύτερον ἡ Ἰδαία, τὸ δὲ φύλλον λεπτότερον καὶ ἀμενηνότερον ἡ παραλία καὶ λειότερον τὸν φλοιὸν καὶ εἰς τὰ δέρματα χρήσιμον· ἡ δὲ ἑτέρα οὔ. καὶ τῶν στροβίλων ὁ μὲν τῆς παραλίας στρογγύλος τε καὶ διαχάσκων ταχέως, ὁ δὲ τῆς Ἰδαίας μακρότερος καὶ χλωρὸς καὶ ἧττον χάσκων ὡς ἂν ἀγριώτερος· τὸ δὲ ξύλον ἰσχυρότερον τὸ τῆς παραλίας· δεῖ γὰρ καὶ τὰς τοιαύτας διαφορὰς

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[1] Plin. 16. 23.

[2] τὸ δὲ . . . τοιαῦτα: this sentence seems out of place, as ἁλίφλοιος was not one of the 'Macedonian' oaks mentioned above (Sch.).

useless, for it breaks in pieces and falls asunder; if it is not hewn with the axe it is better, wherefore they so use it. [1] It is even wretched for burning and for making charcoal; for the charcoal is entirely useless except to the smith, because it springs about and emits sparks. But for use in the smithy it is more serviceable than the other kinds, since, as it goes out when it ceases to be blown, little of it is consumed. [2] The wood of the sea-bark oak is only useful for wheel-axles and the like purposes. Such are the varieties of the oak [3] which men make out.

Of the differences in firs.

IX. [4] The differences between other trees are fewer; for the most part men distinguish them merely according as they are 'male' or 'female,' as has been said, except in a few cases including the fir; for in this tree they distinguish the wild and the cultivated [5] kinds, and make two wild kinds, calling one the 'fir of Ida' (Corsican pine [6]) the other the 'fir of the sea-shore' (Aleppo pine); of these the former is straighter and taller and has thicker leaves,[7] while in the latter the leaves are slenderer and weaker, and the bark is smoother and useful for tanning hides, which the other is not. Moreover the cone of the seaside kind is round and soon splits open, while that of the Idaean kind is longer and green and does not open so much, as being of wilder character. The timber of the seaside kind is stronger,—for one must note such differences also between trees of the

[3] T. describes *πρῖνος σμῖλαξ*, and *φελλόδρυς* in 3. 16, *φελλός* in 3. 17. 1.
[4] Plin. 16. 43.
[5] Stone pine. See Index.
[6] Plin. 16. 48.
[7] *φύλλον* W. conj.; *ξύλον* UMVP.

λαμβάνειν τῶν συγγενῶν· γνώριμοι γὰρ διὰ τὴν χρείαν.

2 Ὀρθότερον δὲ καὶ παχύτερον, ὥσπερ εἴπομεν, ἡ Ἰδαία, καὶ πρὸς τούτοις πιττωδέστερον ὅλως τὸ δένδρον, μελαντέρᾳ δὲ πίττῃ καὶ γλυκυτέρᾳ καὶ λεπτοτέρᾳ καὶ εὐωδεστέρᾳ, ὅταν ᾖ ὠμή· ἑψηθεῖσα δὲ χείρων ἐκβαίνει διὰ τὸ πολὺν ἔχειν τὸν ὀρρόν. ἐοίκασι δ' ἅπερ οὗτοι διαιροῦσιν ὀνόμασιν ἰδίοις οἱ ἄλλοι διαιρεῖν τῷ ἄρρενι καὶ θήλει. φασὶ δ' οἱ περὶ Μακεδονίαν καὶ ἄκαρπόν τι γένος ὅλως εἶναι πεύκης, καὶ τὸ μὲν ἄρρεν βραχύτερόν τε καὶ σκληροφυλλότερον, τὸ δὲ θῆλυ εὐμηκέστερον, καὶ τὰ φύλλα λιπαρὰ καὶ ἁπαλὰ καὶ κεκλιμένα μᾶλλον ἔχειν· ἔτι δὲ τὰ ξύλα τῆς μὲν ἄρρενος περίμητρα καὶ σκληρὰ καὶ ἐν ταῖς ἐργασίαις στρεφόμενα, τῆς δὲ θηλείας εὐεργὰ καὶ ἀστραβῆ καὶ μαλακώτερα.

3 Σχεδὸν δὲ κοινή τις ἡ διαφορὰ πάντων τῶν ἀρρένων καὶ θηλειῶν, ὡς οἱ ὑλοτόμοι φασίν. ἅπαν γὰρ τὸ ἄρρεν τῇ πελεκήσει καὶ βραχύτερον καὶ ἐπεστραμμένον μᾶλλον καὶ δυσεργότερον καὶ τῷ χρώματι μελάντερον, τὸ δὲ θῆλυ εὐμηκέστερον· ἐπεὶ καὶ τὴν αἰγίδα τὴν καλουμένην ἡ θήλεια τῆς πεύκης ἔχει· τοῦτο δ' ἐστὶ τὸ ἐγκάρδιον αὐτῆς·

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[1] *συγγενῶν* conj. R. Const.; *ἀγγείων* UAld.; *ἐγγείων* MV mBas.

[2] *γνώριμοι* conj. R. Const.; *γνώριμος* UAld.H.; *γνώριμα* conj. W.

[3] *ὀρθότερον* conj. R. Const.; *ὀξύτερον* UMVAld.

[4] *μελαντέρᾳ . . . εὐωδεστέρᾳ* conj. W.; *μελάντεραι δὲ πίττη καὶ γλυκύτεραι καὶ λεπτότεραι καὶ εὐωδέστεραι* UMV; *μελαντέρα*

same kind,[1] since it is by their use that the different characters are recognised.[2]

The Idaean kind is, as we have said, of straighter[3] and stouter growth, and moreover the tree is altogether more full of pitch, and its pitch is blacker sweeter thinner and more fragrant[4] when it is fresh; though, when it is boiled, it turns out inferior,[5] because it contains so much watery matter. However it appears that the kinds which these people distinguish by special names are distinguished by others merely as 'male' and 'female.' The people of Macedonia say that there is also a kind of fir which bears no fruit whatever, in which the 'male'[6] (Aleppo pine) is shorter and has harder leaves, while the 'female' (Corsican pine) is taller and has glistening delicate leaves which are more pendent. Moreover the timber of the 'male' kind has much heart-wood,[7] is tough, and warps in joinery work, while that of the 'female' is easy to work, does not warp,[8] and is softer.

This distinction between 'male' and 'female' may, according to the woodmen, be said to be common to all trees. Any wood of a 'male' tree, when one comes to cut it with the axe, gives shorter lengths, is more twisted, harder to work, and darker in colour; while the 'female' gives better lengths. For it is the 'female' fir which contains what is called the *aigis*[9]; this is the heart of the tree; the

δὲ καὶ γλυκυτέρα καὶ λεπτοτέρα καὶ εὐωδεστέρα Ald. λεπτοτέρᾳ, "less viscous.

[5] *cf.* 9. 2. 5; Plin. 16. 60. [6] Plin. 16. 47.

[7] περίμητρα conj. R. Const.: so Mold. explains; περιμήτρια UMV. *cf.* 3. 9. 6.

[8] ἀστραβῆ conj. R. Const.; εὐστραβῆ Ald.

[9] αἰγίδα: *cf.* 5. 1. 9; Plin. 16. 187.

αἴτιον δὲ ὅτι ἀπευκοτέρα καὶ ἧττον ἔνδαδος καὶ λειοτέρα καὶ εὐκτεανωτέρα. γίνεται δὲ ἐν τοῖς μέγεθος ἔχουσι τῶν δένδρων, ὅταν ἐκπεσόντα περισαπῇ τὰ λευκὰ τὰ κύκλῳ. τούτων γὰρ περιαιρεθέντων καὶ καταλειφθείσης τῆς μήτρας ἐκ ταύτης πελεκᾶται· ἔστι δὲ εὔχρουν σφόδρα καὶ λεπτόϊνον. ὃ δὲ οἱ περὶ τὴν Ἴδην δαδουργοὶ καλοῦσι συκῆν, τὸ ἐπιγιγνόμενον ἐν ταῖς πεύκαις, ἐρυθρότερον τὴν χροιὰν τῆς δαδός, ἐν τοῖς ἄρρεσίν ἐστι μᾶλλον· δυσώδες δὲ τοῦτο καὶ οὐκ ὄζει δαδὸς οὐδὲ καίεται ἀλλ' ἀποπηδᾷ ἀπὸ τοῦ πυρός.

4 Πεύκης μὲν οὖν ταῦτα γένη ποιοῦσιν, ἥμερόν τε καὶ ἄγριον, καὶ τῆς ἀγρίας ἄρρενά τε καὶ θήλειαν καὶ τρίτην τὴν ἄκαρπον. οἱ δὲ περὶ τὴν Ἀρκαδίαν οὔτε τὴν ἄκαρπον λέγουσιν οὔτε τὴν ἥμερον πεύκην, ἀλλὰ πίτυν εἶναί φασι· καὶ γὰρ τὸ στέλεχος ἐμφερέστατον εἶναι τῇ πίτυϊ καὶ ἔχειν τήν τε λεπτότητα καὶ τὸ μέγεθος καὶ ἐν ταῖς ἐργασίαις ταὐτὸ τὸ ξύλον· τὸ γὰρ τῆς πεύκης καὶ παχύτερον καὶ λειότερον καὶ ὑψηλότερον εἶναι· καὶ τὰ φύλλα τὴν μὲν πεύκην ἔχειν πολλὰ καὶ λιπαρὰ καὶ βαθέα καὶ κεκλιμένα, τὴν δὲ πίτυν καὶ τὴν κωνοφόρον ταύτην ὀλίγα τε καὶ αὐχμωδέστερα καὶ πεφρικότα μᾶλλον· <ἄμφω δὲ τριχόφυλλα.> ἔτι δὲ τὴν πίτταν ἐμφερεστέραν τῆς

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[1] εὐκτεανωτέρα : εὐκτηδονωτέρα conj. R. Const. *cf.* 5. 1. 9 ; but text is supported by Hesych. *s.v.* *ἰθυκτέανον*.

[2] I omit *καὶ* before *τὰ κύκλῳ*.

[3] Plin. 16. 44.

reason being that it is less resinous, less soaked with pitch, smoother, and of straighter grain.[1] This *aigis* is found in the larger trees, when, as they have fallen down, the white outside part[2] has decayed; when this has been stripped off and the core left, it is cut out of this with the axe; and it is of a good colour with fine fibre. However the substance which the torch-cutters of Mount Ida call the 'fig,'[3] which forms in the fir and is redder in colour than the resin, is found more in the 'male' trees; it has an evil smell, not like the smell of resin, nor will it burn, but it leaps away from the fire.

[4]Such are the kinds of fir which they make out, the cultivated and the wild, the latter including the 'male' and the 'female' and also the kind which bears no fruit. However the Arcadians say that neither the sterile kind nor the cultivated is a fir, but a pine; for, they say, the trunk closely resembles the pine and has its slenderness, its stature, and the same kind[5] of wood for purposes of joinery, the trunk of the fir being thicker smoother and taller; moreover that the fir has many leaves, which are glossy massed together[6] and pendent, while in the pine and in the above-mentioned cone-bearing tree[7] the leaves are few and drier and stiffer; though in both the leaves are hair-like.[8] Also, they say, the pitch of this tree is more like that of the pine; for

[4] *ταῦτα γένη* conj. R. Const. from G; *ταῦτά γε* UMVAld.; Plin. 16. 45–49.

[5] *ταὐτὸ* conj. W.; *αὐτὸ* Ald.

[6] *βαθέα* : *δασέα* conj. R. Const. *cf.* 3. 16. 2.

[7] *i.e.* the cultivated *πεύκη* (so called). T. uses this periphrasis to avoid begging the question of the name.

[8] *ἄμφω δὲ τριχ.* ins. here by Sch.; in MSS. and Ald. the words occur in § 5 after *πιττωδέστερον*.

πίτυος· καὶ γὰρ τὴν πίτυν ἔχειν ὀλίγην τε καὶ πικράν, ὥσπερ καὶ τὴν κωνοφόρον, τὴν δὲ πεύκην εὐώδη καὶ πολλήν. φύεται δ' ἐν μὲν τῇ Ἀρκαδίᾳ ἡ πίτυς ὀλίγη περὶ δὲ τὴν Ἠλείαν πολλή. οὗτοι μὲν οὖν ὅλῳ τῷ γένει διαμφισβητοῦσιν.

5 Ἡ δὲ πίτυς δοκεῖ τῆς πεύκης καὶ διαφέρειν τῷ λιπαρωτέρα τε εἶναι καὶ λεπτοφυλλοτέρα καὶ τὸ μέγεθος ἐλάττων καὶ ἧττον ὀρθοφυής· ἔτι δὲ τὸν κῶνον ἐλάττω φέρειν καὶ πεφρικότα μᾶλλον καὶ τὸ κάρυον πιττωδέστερον· καὶ τὰ ξύλα λευκότερα καὶ ὁμοιότερα τῇ ἐλάτῃ καὶ τὸ ὅλον ἄπευκα. διαφορὰν δ' ἔχει καὶ ταύτην μεγάλην πρὸς τὴν πεύκην· πεύκην μὲν γὰρ ἐπικαυθεισῶν τῶν ῥιζῶν οὐκ ἀναβλαστάνειν, τὴν πίτυν δέ φασί τινες ἀναβλαστάνειν, ὥσπερ καὶ ἐν Λέσβῳ ἐμπρησθέντος τοῦ Πυρραίων ὄρους τοῦ πιτυώδους. νόσημα δὲ ταῖς πεύκαις τοιοῦτόν τι λέγουσι συμβαίνειν οἱ περὶ τὴν Ἴδην ὥστ', ὅταν μὴ μόνον τὸ ἐγκάρδιον ἀλλὰ καὶ τὸ ἔξω τοῦ στελέχους ἔνδᾳδον γένηται, τηνικαῦτα ὥσπερ ἀποπνίγεσθαι. τοῦτο δὲ αὐτόματον συμβαίνει δι' εὐτροφίαν τοῦ δένδρου, ὡς ἄν τις εἰκάσειεν· ὅλον γὰρ γίνεται δᾳδός· περὶ μὲν οὖν τὴν πεύκην ἴδιον τοῦτο πάθος.

6 Ἐλάτη δ' ἐστὶν ἡ μὲν ἄρρην ἡ δὲ θήλεια, διαφορὰς δ' ἔχουσα τοῖς φύλλοις· ὀξύτερα γὰρ καὶ κεντητικώτερα τὰ τοῦ ἄρρενος καὶ ἐπεστραμμένα μᾶλλον, δι' ὃ καὶ οὐλότερον τῇ ὄψει φαίνεται τὸ δένδρον ὅλον. καὶ τῷ ξύλῳ· λευκότερον γὰρ καὶ μαλακώτερον καὶ εὐεργέστερον τὸ τῆς θηλείας καὶ

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[1] πικρὰν conj. R. Const. from G ; μικρὰν VAld.

[2] καὶ ταύτην μεγάλην πρὸς conj. Sch.; καὶ τὴν μεγ. πρὸς UMV; μεγάλην πρὸς Ald.

in the pine too it is scanty and bitter,[1] as in this other cone-bearing tree, but in the fir it is fragrant and abundant. Now the pine is rare in Arcadia, but common in Elis. The Arcadians then dispute altogether the nomenclature.

The pine appears to differ also from the fir in being glossier and having finer leaves, while it is smaller in stature and does not grow so straight; also in bearing a smaller cone, which is stiffer and has a more pitchy kernel, while its wood is whiter, more like that of the silver-fir, and wholly free from pitch. And there is another great difference[2] between it and the fir; the fir, if it is burnt down to the roots, does not shoot up again, while the pine, according to some, will do so; for instance this happened in Lesbos,[3] when the pine-forest of Pyrrha[4] was burnt. The people of Ida say that the fir is liable to a kind of disease;—when not only the heart but the outer part of the trunk becomes glutted[5] with pitch, the tree then is as it were choked. This happens of its own accord through the excessive luxuriance of the tree, as one may conjecture; for it all turns into pitch-glutted wood. This then is an affection peculiar to the fir.

[6]The silver-fir is either 'male' or 'female,' and has differences in its leaves[7]; those of the 'male' are sharper more needle-like and more bent; wherefore the whole tree has a more compact appearance. There are also differences in the wood, that of the 'female' being whiter softer and easier to work,

[3] *ἐν Λέσβῳ* conj. W. from G, and Plin. 16. 46; *εἰς Λέσβον* MSS.

[4] On the W. of Lesbos, modern Caloni. *cf.* 2. 2. 6; Plin. *l.c.*

[5] *cf.* I. 6. 1; Plin. 16. 44.

[6] Plin. 16. 48. [7] *cf.* I. 8. 2.

τὸ ὅλον στέλεχος εὐμηκέστερον· τὸ δὲ τοῦ ἄρρενος ποικιλώτερον καὶ παχύτερον καὶ σκληρότερον καὶ περίμητρον μᾶλλον ὅλως δὲ φαυλότερον τὴν ὄψιν. ἐν δὲ τῷ κώνῳ τῷ μὲν τοῦ ἄρρενός ἐστι κάρυα ὀλίγα ἐπὶ τοῦ ἄκρου, τῷ δὲ τῆς θηλείας ὅλως οὐδέν, ὡς οἱ ἐκ Μακεδονίας ἔλεγον. ἔχει δὲ πτέρυγας τὸ φύλλον καὶ ἐπ' ἔλαττον, ὥστε τὴν ὅλην μορφὴν εἶναι θολοειδῆ καὶ παρόμοιον μάλιστα ταῖς Βοιωτίαις κυνέαις· πυκνὸν δὲ οὕτως ὥστε μήτε χιόνα διϊέναι μήθ' ὑετόν. ὅλως δὲ καὶ τῇ ὄψει τὸ δένδρον καλόν· καὶ γὰρ ἡ βλάστησις ἰδία τις, ὥσπερ εἴρηται, παρὰ τὰς ἄλλας καὶ μόνη τάξιν ἔχουσα· τῷ δὲ μεγέθει μέγα καὶ πολὺ τῆς πεύκης εὐμηκέστερον.

7 Διαφέρει δὲ καὶ κατὰ τὸ ξύλον οὐ μικρόν· τὸ μὲν γὰρ τῆς ἐλάτης ἰνῶδες καὶ μαλακὸν καὶ κοῦφον, τὸ δὲ τῆς πεύκης δᾳδῶδες καὶ βαρὺ καὶ σαρκωδέστερον. ὄζους δὲ ἔχει πλείους μὲν ἡ πεύκη σκληροτέρους δ' ἡ ἐλάτη, σχεδὸν δὲ πάντων ὡς εἰπεῖν σκληροτέρους, τὸ δὲ ξύλον μαλακώτερον. ὅλως δὲ οἱ ὄζοι πυκνότατοι καὶ στερεώτατοι μόνον οὐ διαφανεῖς ἐλάτης καὶ πεύκης καὶ τῷ χρώματι δᾳδώδεις καὶ μάλιστα διάφοροι τοῦ ξύλου, μᾶλλον δὲ τῆς ἐλάτης. ἔχει δέ, ὥσπερ ἡ πεύκη τὴν αἰγίδα, καὶ ἡ ἐλάτη τὸ λευκὸν λοῦσσον

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[1] παχύτερον conj. W.; πλατύτερον Ald.

[2] Plin. 16. 48 and 49. [3] For the tense see Intr. p. xx.

[4] φύλλον, *i.e.* the leafy shoot. Sch. considers φύλλον to be corrupt, and refers the following description to the cone; W. marks a lacuna after φύλλον. Pliny, *l.c.*, seems to have read φύλλον, but does not render καὶ ἐπ' ἔλαττον . . . κυνέαις. The words καὶ ἐπ' ἔλαττον can hardly be sound as they stand. For the description of the foliage *cf.* 1. 10. 5.

while the whole trunk is longer; that of the 'male' is less of a uniform colour thicker[1] and harder, has more heart-wood, and is altogether inferior in appearance. In the cone[2] of the 'male' are a few seeds at the apex, while that of the 'female,' according to what the Macedonians said,[3] contains none at all. The foliage[4] is feathered and the height disproportionate so that the general appearance of the tree is dome-like,[5] and closely resembles the Boeotian peasant's hat[6]; and it is so dense that neither snow nor rain penetrates it. And in general the tree has a handsome appearance; for its growth is somewhat peculiar, as has been said, compared with the others, it being the only one which is regular, and in stature it is large, much taller than the fir.

[7]There is also not a little difference in the wood: that of the silver-fir is fibrous[8] soft and light, that of the fir is resinous heavy and more fleshy. The fir has more knots,[9] but the silver-fir harder ones; indeed they may be said to be harder than those of any tree, though the wood otherwise is softer. And in general the knots of silver-fir and fir are of the closest and most solid[10] texture and almost[11] transparent: in colour they are like resin-glutted wood, and quite different from the rest of the wood; and this is especially so[12] in the silver-fir. And just as the fir has its *aigis*,[13] so the silver-fir has what is

[5] θολοειδῆ conj. Scal.; θηλοειδῆ U (erased); θηλοειδὲς MV; *ut concameratum imitetur* G; ? θολιοειδῆ; in Theocr. 15. 39. θολία seems to be a sun-hat.

[6] κυνέαις: *cf.* Hesych. *s.v.* κυνῆ Βοιωτία, apparently a hat worn in the fields.

[7] *cf.* 5. 1. 7. [8] *cf.* 5. 1. 5. [9] *cf.* 5. 1. 6.

[10] *cf.* 5. 1. 6, κερατώδεις. [11] οὐ ins. Sch.

[12] μᾶλλον δὲ conj. W.; μᾶλλον ἢ Ald. [13] *cf.* 3. 9. 3.

καλούμενον, οἷον ἀντίστροφον τῇ αἰγίδι, πλὴν τὸ μὲν λευκὸν ἡ δ' αἰγὶς εὔχρως διὰ τὸ ἔνδαδον. πυκνὸν δὲ καὶ λευκὸν γίνεται καὶ καλὸν ἐκ τῶν πρεσβυτέρων ἤδη δένδρων· ἀλλὰ σπάνιον τὸ χρηστόν, τὸ δὲ τυχὸν δαψιλές, ἐξ οὗ τά τε τῶν ζωγράφων πινάκια ποιοῦσι καὶ τὰ γραμματεῖα τὰ πολλά· τὰ δ' ἐσπουδασμένα ἐκ τοῦ βελτίονος.

8 Οἱ δὲ περὶ Ἀρκαδίαν ἀμφότερα καλοῦσιν αἰγίδα καὶ τὴν τῆς πεύκης καὶ τὴν τῆς ἐλάτης, καὶ εἶναι πλείω τὴν τῆς ἐλάτης ἀλλὰ καλλίω τὴν τῆς πεύκης· εἶναι γὰρ τῆς μὲν ἐλάτης πολλήν τε καὶ λείαν καὶ πυκνήν, τῆς δὲ πεύκης ὀλίγην, τὴν μέντοι οὖσαν οὐλοτέραν καὶ ἰσχυροτέραν καὶ τὸ ὅλον καλλίω. οὗτοι μὲν οὖν ἐοίκασι τοῖς ὀνόμασι διαφωνεῖν. ἡ δὲ ἐλάτη ταύτας ἔχει τὰς διαφορὰς πρὸς τὴν πεύκην καὶ ἔτι τὴν περὶ τὴν ἄμφαυξιν, ἣν πρότερον εἴπομεν.

X. Ὀξύη δ' οὐκ ἔχει διαφορὰς ἀλλ' ἐστὶ μονογενές· ὀρθοφυὲς δὲ καὶ λεῖον καὶ ἄνοζον καὶ πάχος καὶ ὕψος ἔχον σχεδὸν ἴσον τῇ ἐλάτῃ· καὶ τἆλλα δὲ παρόμοιον [τε] τὸ δένδρον· ξύλον δὲ εὔχρουν ἰσχυρὸν εὔινον καὶ φλοιὸν λεῖον καὶ παχύν, φύλλον δ' ἀσχιδὲς προμηκέστερον ἀπίου καὶ ἐπακάνθιζον ἐξ ἄκρου, ῥίζας οὔτε πολλὰς οὔτε κατὰ βάθους· ὁ δὲ καρπὸς λεῖος βαλανώδης ἐν ἐχίνῳ

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[1] *cf.* Eur. *I.A.* 99 ; Hipp. 1254.
[2] τὰ δ' conj. Scal. ; καὶ Ald.
[3] πεύκης conj. Scal. from G ; ἐλάτης Ald.
[4] ἐλάτης conj. Scal. from G ; πεύκης Ald.

called its white 'centre,' which answers, as it were, to the *aigis* of the fir, except that it is white, while the other is bright-coloured because it is glutted with pitch. It becomes close white and good in trees which are of some age, but it is seldom found in good condition, while the ordinary form of it is abundant and is used to make painters' boards and ordinary writing tablets,[1] superior ones being[2] made of the better form.

However the Arcadians call both substances *aigis*, alike that of the fir[3] and the corresponding part of the silver-fir,[4] and say that, though the silver-fir produces more, that of the fir is better; for that, though that of the silver-fir is abundant[5] smooth and close, that of the fir, though scanty, is compacter stronger and fairer in general. The Arcadians then appear to differ as to the names which they give. Such are the differences in the silver-fir as compared with the fir, and there is also that of having the *amphauxis*,[6] which we mentioned before.

Of beech, yew, hop-hornbeam, lime.

X. The beech presents no differences, there being but one kind. It is a straight-growing smooth and unbranched tree, and in thickness and height is about equal to the silver-fir, which it also resembles in other respects; the wood is of a fair colour strong and of good grain, the bark smooth and thick, the leaf undivided, longer than a pear-leaf, spinous at the tip,[7] the roots neither numerous nor running deep; the fruit is smooth like an acorn, enclosed in a shell,

[5] πολλὴν conj. Gesner; οὐλην UmBas.; ὅλην MVAld.
[6] *cf.* 3. 7. 1.
[7] *i.e.* mucronate. *cf.* 3. 11. 3.

πλὴν [οὐκ] ἀνακάνθῳ καὶ λείῳ, καὶ οὐχ ὡς ἡ διοσβάλανος ἀκανθώδει, προσεμφερὴς δὲ καὶ κατὰ γλυκύτητα καὶ κατὰ τὸν χυλὸν ἐκείνῳ. γίνεται δὲ καὶ ἐν τῷ ὄρει λευκή, ἣ καὶ χρήσιμον ἔχει τὸ ξύλον πρὸς πολλά· καὶ γὰρ πρὸς ἁμαξουργίαν καὶ πρὸς κλινοπηγίαν καὶ εἰς διφρουργίαν καὶ εἰς τραπεζίαν καὶ εἰς ναυπηγίαν· ἡ δ' ἐν τοῖς πεδίοις μέλαινα καὶ ἄχρηστος πρὸς ταῦτα· τὸν δὲ καρπὸν ἔχουσι παραπλήσιον.

2 Μονογενὴς δὲ καὶ ἡ μίλος, ὀρθοφυὴς δὲ καὶ εὐαυξὴς καὶ ὁμοία τῇ ἐλάτῃ, πλὴν οὐχ ὑψηλὸν οὕτω, πολυμάσχαλον δὲ μᾶλλον. ὅμοιον δὲ καὶ τὸ φύλλον ἔχει τῇ ἐλάτῃ, λιπαρώτερον δὲ καὶ μαλακώτερον. τὸ δὲ ξύλον ἡ μὲν ἐξ Ἀρκαδίας μέλαν καὶ φοινικοῦν, ἡ δ' ἐκ τῆς Ἴδης ξανθὸν σφόδρα καὶ ὅμοιον τῇ κέδρῳ, δι' ὃ καὶ τοὺς πωλοῦντάς φασιν ἐξαπατᾶν ὡς κέδρον πωλοῦντας· πᾶν γὰρ εἶναι καρδίαν, ὅταν ὁ φλοιὸς περιαιρεθῇ· ὅμοιον δὲ καὶ τὸν φλοιὸν ἔχειν καὶ τῇ τραχύτητι καὶ τῷ χρώματι τῇ κέδρῳ, ῥίζας δὲ μικρὰς καὶ λεπτὰς καὶ ἐπιπολαίους. σπάνιον δὲ τὸ δένδρον περὶ τὴν Ἴδην, περὶ δὲ Μακεδονίαν καὶ Ἀρκαδίαν πολύ· καὶ καρπὸν φέρει στρογγύλον μικρῷ μείζω κυάμου, τῷ χρώματι δ' ἐρυθρὸν καὶ μαλακόν· φασὶ δὲ τὰ μὲν λόφουρα ἐὰν φάγῃ τῶν φύλλων ἀποθνήσκειν, τὰ δὲ μηρυκάζοντα οὐδὲν πάσχειν. τὸν δὲ καρπὸν ἐσθίουσι καὶ τῶν ἀνθρώπων τινὲς καὶ ἔστιν ἡδὺς καὶ ἀσινής.

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[1] *ἐχῖνος* being otherwise used of a prickly case, such as that of the chestnut. *πλὴν ἀνακ. καὶ λείῳ* conj. W.; *πλὴν οὐκ ἀνακάνθωι καὶ λείωι* U; *πλὴν οὐκ ἐν ἀκάνθῳ* MVAld.

which is however without prickles[1] and smooth, not spinous,[2] like the chestnut, though in sweetness and flavour it resembles it. In mountain country it also grows white and has[3] timber which is useful for many purposes, for making carts beds chairs and tables, and for shipbuilding[4]; while the tree of the plains is black and useless for these purposes; but the fruit is much the same in both.

[5]The yew has also but one kind, is straight-growing, grows readily, and is like the silver-fir, except that it is not so tall and is more branched. Its leaf is also like that of the silver-fir, but glossier and less stiff. As to the wood, in the Arcadian yew it is black or red, in that of Ida bright yellow and like prickly cedar; wherefore they say that dealers practise deceit, selling it for that wood: for that it is all heart, when the bark is stripped off; its bark also resembles that of prickly cedar in roughness and colour, its roots are few slender and shallow. The tree is rare about Ida, but common in Macedonia and Arcadia; it bears a round fruit a little larger than a bean, which is red in colour and soft; and they say that, if beasts of burden[6] eat of the leaves they die, while ruminants take no hurt. Even men sometimes eat the fruit, which is sweet and harmless.

[2] *ἀκανθώδει* conj. R. Const.; *ἀκανθώδη* Ald.H.
[3] *λευκὴ ἢ καὶ* conj. W.; *λευκή τε καὶ* Ald.H.
[4] *cf.* 5. 6. 4; 5. 7. 2 and 6.
[5] Plin. 16. 62. (description taken from this passage, but applied to *fraxinus*, apparently from confusion between *μίλος* and *μελία*).
[6] *cf.* 2. 7. 4 n.

3 Ἔστι δὲ καὶ ἡ ὄστρυς μονοειδής, ἣν καλοῦσί τινες ὀστρύαν, ὁμοφυὲς τῇ ὀξύᾳ τῇ τε φυτείᾳ καὶ τῷ φλοιῷ· φύλλα δὲ ἀπιοειδῆ τῷ σχήματι, πλὴν προμηκέστερα πολλῷ καὶ εἰς ὀξὺ συνηγμένα καὶ μείζω, πολύϊνα δέ, ἀπὸ τῆς μέσης εὐθείας καὶ μεγάλης τῶν ἄλλων πλευροειδῶς κατατεινουσῶν καὶ πάχος ἐχουσῶν· ἔτι δὲ ἐρρυτιδωμένα κατὰ τὰς ἴνας καὶ χαραγμὸν ἔχοντα κύκλῳ λεπτόν· τὸ δὲ ξύλον σκληρὸν καὶ ἄχρουν, ἔκλευκον· καρπὸν δὲ μικρὸν πρόμακρον ὅμοιον κριθῇ ξανθόν· ῥίζας δὲ ἔχει μετεώρους· ἔνυδρον δὲ καὶ φαραγγῶδες. λέγεται δὲ ὡς οὐκ ἐπιτήδειον εἰς οἰκίαν εἰσφέρειν· δυσθανατεῖν γάρ φασι καὶ δυστοκεῖν οὗ ἂν ᾖ.

4 Τῆς δὲ φιλύρας ἡ μὲν ἄρρην ἐστὶ ἡ δὲ θήλεια· διαφέρουσι δὲ τῇ μορφῇ τῇ ὅλῃ καὶ τῇ τοῦ ξύλου καὶ τῷ τὸ μὲν εἶναι κάρπιμον τὸ δ' ἄκαρπον. τὸ μὲν γὰρ τῆς ἄρρενος ξύλον σκληρὸν καὶ ξανθὸν καὶ ὀζωδέστερον καὶ πυκνότερόν ἐστι, ἔτι δ' εὐωδέστερον, τὸ δὲ τῆς θηλείας λευκότερον. καὶ ὁ φλοιὸς τῆς μὲν ἄρρενος παχύτερος καὶ περιαιρεθεὶς ἀκαμπὴς διὰ τὴν σκληρότητα, τῆς δὲ θηλείας λεπτότερος καὶ εὐκαμπής, ἐξ οὗ τὰς κίστας ποιοῦσιν· καὶ ἡ μὲν ἄκαρπος καὶ ἀνανθής, ἡ δὲ θήλεια καὶ ἄνθος ἔχει καὶ καρπόν· τὸ μὲν ἄνθος καλυκῶδες παρὰ τὸν τοῦ φύλλου μίσχον καὶ παρὰ

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[1] *cf.* 1. 8. 2 (ὀστρυίς), 3. 3. 1 ; *C.P.* 5. 12. 9 (ὀστρύη) ; Plin. 13. 117.

[2] *μέσης . . . κατατεινουσῶν* conj. Sch.; *μέσης πλευροειδῶς τῶν ἄλλων εὐθειῶν καὶ μεγάλην κατατεινουσῶν* Ald. *cf.* 1. 10. 2 ; 3. 17. 3.

The *ostrys* (hop-hornbeam),[1] which some call *ostrya*, has also but one kind: it is like the beech in growth and bark; its leaves are in shape like a pear's, except that they are much longer, come to a sharp point, are larger, and have many fibres, which branch out like ribs from a large straight one[2] in the middle, and are thick; also the leaves are wrinkled along the fibres and have a finely serrated edge; the wood is hard colourless and whitish; the fruit is small oblong and yellow like barley; it has shallow roots; it loves water and is found in ravines. It is said to be unlucky to bring it into the house, since, wherever it is, it is supposed to cause a painful death[3] or painful labour in giving birth.

[4]The lime has both 'male' and 'female' forms, which differ in their general appearance, in that of the wood, and in being respectively fruit-bearing and sterile. The wood of the 'male' tree is hard yellow more branched closer, and also more fragrant[5]; that of the 'female' is whiter. The bark of the 'male' is thicker, and, when stripped off, is unbending because of its hardness; that of the 'female' is thinner[6] and flexible; men make their writing-cases[7] out of it. The 'male' has neither fruit nor flower, but the 'female' has both flower and fruit; the flower is cup-shaped, and appears alongside of the stalk of the leaf, or alongside of next year's

[3] δυσθανατεῖν I conj.; δυσθάνατον P_2Ald.; δυσθανατᾶν conj. Sch., but δυσθανατᾶν has a desiderative sense.

[4] Plin. 16. 65.

[5] ἔτι δ' εὐωδ. inserted here by Sch.; *cf.* Plin., *l.c.* In Ald. the words, with the addition τὸ τῆς θηλείας, occur after ποιοῦσιν.

[6] λεπτότερος conj. Sch; λευκότερος Ald.

[7] *cf.* 3. 13. 1; Ar. *Vesp.* 529.

τὴν εἰς νέωτα κάχρυν ἐφ' ἑτέρου μίσχου, χλοερὸν δὲ ὅταν ᾖ καλυκῶδες, ἐκκαλυπτόμενον δὲ ἐπίξανθον· ἡ δὲ ἄνθησις ἅμα τοῖς ἡμέροις. ὁ δὲ καρπὸς στρογγύλος πρόμακρος ἡλίκος κύαμος ὅμοιος τῷ τοῦ κιττοῦ, γωνίας ἔχων ὁ ἀδρὸς πέντε οἷον ἰνῶν ἐξεχουσῶν καὶ εἰς ὀξὺ συναγομένων· ὁ δὲ μὴ ἀδρὸς ἀδιαρθρότερος· διακνιζόμενος δὲ ὁ ἀδρὸς ἔχει μίκρ' ἄττα καὶ λεπτὰ σπερμάτια ἡλίκα καὶ ὁ τῆς ἀδραφάξυος. τὸ δὲ φύλλον καὶ ὁ φλοιὸς ἡδέα καὶ γλυκέα· τὴν δὲ μορφὴν κιττῶδες τὸ φύλλον, πλὴν ἐκ προσαγωγῆς μᾶλλον ἡ περιφέρεια, κατὰ τὸ πρὸς τῷ μίσχῳ κυρτότατον, ἀλλὰ κατὰ μέσον εἰς ὀξύτερον τὴν συναγωγὴν ἔχον καὶ μακρότερον, ἔπουλον δὲ κύκλῳ καὶ κεχαραγμένον. μήτραν δ' ἔχει τὸ ξύλον μικρὰν καὶ οὐ πολὺ μαλακωτέραν τοῦ ἄλλου· μαλακὸν γὰρ καὶ τὸ ἄλλο ξύλον.

XI. Τῆς δὲ σφενδάμνου, καθάπερ εἴπομεν, δύο γένη ποιοῦσιν, οἱ δὲ τρία· ἓν μὲν δὴ τῷ κοινῷ προσαγορεύουσι σφένδαμνον, ἕτερον δὲ ζυγίαν, τρίτον δὲ κλινότροχον, ὡς οἱ περὶ Στάγειρα. διαφορὰ δ' ἐστὶ τῆς ζυγίας καὶ τῆς σφενδάμνου ὅτι ἡ μὲν σφένδαμνος λευκὸν ἔχει τὸ ξύλον καὶ εὐινότερον, ἡ δὲ ζυγία ξανθὸν καὶ οὖλον· τὸ δὲ φύλλον εὐμέγεθες ἄμφω, τῇ σχίσει ὅμοιον τῷ

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[1] *cf.* 3. 5. 5. and 6.
[2] διακνιζόμενος : διασχιζόμενος, 'when split open,' conj. W.
[3] *cf.* 1. 12. 4 ; *C.P.* 6. 12. 7. [4] 3. 3. 1.
[5] προσαγορεύουσι conj. W. from G ; προσαγορεύεται Ald.

winter-bud[1] on a separate stalk; it is green, when in the cup-like stage, but brownish as it opens; it appears at the same time as in the cultivated trees. The fruit is rounded oblong as large as a bean, resembling the fruit of the ivy; when mature, it has five angular projections, as it were, made by projecting fibres which meet in a point; the immature fruit is less articulated. When the mature fruit is pulled to pieces,[2] it shows some small fine seeds of the same size as those of orach. The leaf and the bark[3] are well flavoured and sweet; the leaf is like that of the ivy in shape, except that it rounds more gradually, being most curved at the part next the stalk, but in the middle contracting to a sharper and longer apex, and its edge is somewhat puckered and jagged. The timber contains little core, which is not much softer than the other part; for the rest of the wood is also soft.

Of maple and ash.

XI. Of the maple, as we have said,[4] some make[5] two kinds, some three; one they call by the general name 'maple,' another *zygia*, the third *klinotrokhos*[6]; this name, for instance, is used by the people of Stagira. The difference between *zygia* and maple proper is that the latter has white wood of finer fibre, while that of *zygia* is yellow and of compact texture. The leaf[7] in both trees is large, resembling that of the plane in the way in which it is

[6] *κλινότροχον* Ald.; *κλινόστροχον* U; *ἰνότροχον* conj. Salm. from Plin. 16. 66 and 67, *cursivenium* or *crassivenium*. Sch. thinks that the word conceals *γλῖνος*; *cf.* 3. 3. 1; 3. 11. 2.

[7] *φύλλον* conj. R. Const.; *ξύλον* UMVAld.H.G.

τῆς πλατάνου τετανὸν λεπτότερον δὲ καὶ ἀσαρκότερον καὶ μαλακώτερον καὶ προμηκέστερον· τὰ δὲ σχίσμαθ' ὅλα τ' εἰς ὀξὺ συνήκοντα καὶ οὐχ οὕτω μεσοσχιδῆ ἀλλ' ἀκροσχιδέστερα· οὐ πολύϊνα δὲ ὡς κατὰ μέγεθος. ἔχει δὲ καὶ φλοιὸν μικρῷ τραχύτερον τοῦ τῆς φιλύρας, ὑποπέλιον παχὺν καὶ πυκνότερον ἢ ὁ τῆς πίτυος καὶ ἀκαμπῆ· ῥίζαι δ' ὀλίγαι καὶ μετέωροι καὶ οὖλαι σχεδὸν αἱ πλεῖσται
2 καὶ αἱ τῆς ξανθῆς καὶ αἱ τῆς λευκῆς. γίνεται δὲ μάλιστα ἐν τοῖς ἐφύδροις, ὡς οἱ περὶ τὴν Ἴδην λέγουσι, καὶ ἔστι σπάνιον. περὶ ἄνθους δὲ οὐκ ἤδεσαν· τὸν δὲ καρπὸν οὐ λίαν μὲν προμήκη, παρόμοιον δὲ τῷ παλιούρῳ πλὴν προμηκέστερον. οἱ δ' ἐν τῷ Ὀλύμπῳ τὴν μὲν ζυγίαν ὄρειον μᾶλλον, τὴν δὲ σφένδαμνον καὶ ἐν τοῖς πεδίοις φύεσθαι· εἶναι δὲ τὴν μὲν ἐν τῷ ὄρει φυομένην ξανθὴν καὶ εὔχρουν καὶ οὔλην καὶ στερεάν, ᾗ καὶ πρὸς τὰ πολυτελῆ τῶν ἔργων χρῶνται, τὴν δὲ πεδεινὴν λευκήν τε καὶ μανοτέραν καὶ ἧττον οὔλην· καλοῦσι δ' αὐτὴν ἔνιοι γλεῖνον, οὐ σφένδαμνον. . . . καὶ τῆς ἄρρενος οὐλότερα τὰ ξύλα συνεστραμμένα, καὶ ἐν τῷ πεδίῳ ταύτην φύεσθαι μᾶλλον καὶ βλαστάνειν πρωΐτερον.

3 Ἔστι δὲ καὶ μελίας γένη δύο. τούτων δ' ἡ μὲν ὑψηλὴ καὶ εὐμήκης ἐστὶ τὸ ξύλον ἔχουσα λευκὸν καὶ εὔινον καὶ μαλακώτερον καὶ ἀνοζό-

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[1] τετανὸν : *cf.* 3. 12. 5 ; 3. 15. 6.

[2] σχίσμαθ' conj. R. Const. from G ; σχίμαθ' Ald.Cam. ; σχήμαθ' Bas., which W. reads.

[3] ὅλα : ? ὅλως.

[4] *i.e.* do not run back so far.

[5] πολύϊνα conj. R. Const. ; πολύ· ἰνα δὲ Ald. ; πολύ· ἴνα δὲ M.

divided; it is smooth,[1] but more delicate, less fleshy, softer, longer in proportion to its breadth, and the divisions[2] all[3] tend to meet in a point, while they do not occur so much in the middle of the leaf,[4] but rather at the tip; and for their size the leaves have not many fibres.[5] The bark too is somewhat rougher than that of the lime, of blackish colour thick closer[6] than that of the Aleppo pine and stiff; the roots are few shallow and compact for the most part, both those of the yellow and those of the white-wooded tree. This tree occurs chiefly in wet ground,[7] as the people of Mount Ida say, and is rare. About its flower they did[8] not know, but the fruit, they said, is not very oblong, but like that of Christ's thorn,[9] except that it is more oblong than that. But the people of Mount Olympus say that, while *zygia* is rather a mountain tree, the maple proper grows also in the plains; and that the form which grows in the mountains has yellow wood of a bright colour, which is of compact texture and hard, and is used even for expensive work, while that of the plains has white wood of looser make and less compact texture. And some call it *gleinos*[10] instead of maple. . . .[11] The wood of the 'male' tree is of compacter texture and twisted; this tree, it is said, grows rather in the plain and puts forth its leaves earlier.

[12] There are also two kinds of ash. Of these one is lofty and of strong growth with white wood of good fibre, softer, with less knots, and of more compact

[5] *πυκνότερον* conj. Scal. from G; *πυρώτερον* UAld.
[7] *ἐφύδροις*: *ὑφύδροις* conj. Sch. *cf. ὕφαμμος, ὑπόπετρος.*
[8] *cf.* 3. 9. 6 n.; Intr. p. xx. [9] *cf.* 3. 18. 3.
[10] *cf.* 3. 3. 1; Plin. 16. 67.
[11] W. marks a lacuna: the description of the 'female' tree seems to be missing. [12] Plin. 16. 62–64.

τερον καὶ οὐλότερον· ἡ δὲ ταπεινοτέρα καὶ ἧττον εὐαυξὴς καὶ τραχυτέρα καὶ σκληροτέρα καὶ ξανθοτέρα. τὰ δὲ φύλλα τῷ μὲν σχήματι δαφνοειδῆ, πλατυφύλλου δάφνης, εἰς ὀξύτερον δὲ συνηγμένα, χαραγμὸν δέ τιν' ἔχοντα κύκλῳ καὶ ἐπακανθίζοντα· τὸ δὲ ὅλον, ὅπερ εἴποι τις ἂν φύλλον τῷ ἅμα φυλλορροεῖν, ἀφ' ἑνὸς μίσχου· καὶ περὶ μίαν οἷον ἶνα κατὰ γόνυ καὶ συζυγίαν τὰ φύλλα καθ' ἕκαστον πέφυκε, συχνῶν διεχουσῶν τῶν συζυγιῶν, ὁμοίως καὶ ἐπὶ τῆς οἴης. ἔστι δὲ τῶν μὲν βραχέα τὰ γόνατα καὶ αἱ συζυγίαι τὸ πλῆθος ἐλάττους, τῶν δὲ τῆς λευκῆς καὶ μακρὰ καὶ πλείους· καὶ τὰ καθ' ἕκαστον φύλλα μακρότερα καὶ στενότερα, τὴν δὲ χρόαν πρασώδη. φλοιὸν δὲ λεῖον ἔχει, καπυρὸν δὲ καὶ λεπτὸν καὶ τῇ
4 χρόᾳ πυρρόν. πυκνόρριζον δὲ καὶ παχύρριζον καὶ μετέωρον. καρπὸν δὲ οἱ μὲν περὶ τὴν Ἴδην οὐχ ὑπελάμβανον ἔχειν οὐδ' ἄνθος· ἔχει δ' ἐν λοβῷ λεπτῷ καρπὸν καρυηρὸν ὡς τῶν ἀμυγδαλῶν ὑπόπικρον τῇ γεύσει. φέρει δὲ καὶ ἕτερ' ἄττα οἷον βρύα, καθάπερ ἡ δάφνη, πλὴν στιφρότερα· καὶ ἕκαστον καθ' αὑτὸ σφαιροειδές, ὥσπερ τὰ τῶν πλατάνων· τούτων δὲ τὰ μὲν περὶ τὸν καρπόν, τὰ δ' ἀπηρτημένα πολύ, καὶ τὰ πλεῖστα οὕτω. φύεται δὲ ἡ μὲν λεία περὶ τὰ βαθυάγκη μάλιστα καὶ ἔφυδρα, ἡ δὲ τραχεῖα καὶ περὶ τὰ ξηρὰ καὶ πετρώδη. ἔνιοι δὲ καλοῦσι τὴν μὲν μελίαν

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[1] οὐλότερον : ἀνουλότερον W. from Sch.'s conj.; ἄνουλος does not occur elsewhere, and T. uses μανός as the opposite of οὖλος.

[2] *i.e.* instead of considering the leaflet as the unit. For the description *cf.* 3. 12. 5 ; 3. 15. 4.

texture[1]; the other is shorter, less vigorous in growth, rougher harder and yellower. The leaves in shape are like those of the bay, that is, the broad-leaved bay, but they contract to a sharper point, and they have a sort of jagged outline with sharp points. The whole leaf (if one may consider this as[2] a 'leaf' because it is all shed at once) grows on a single stalk; on either side of a single fibre, as it were, the leaflets grow at a joint in pairs, which are numerous and distinct, just as in the sorb. In some leaves the joints are short[3] and the pairs fewer in number, but in those of the white kind the joint is long and the pairs more numerous, while the leaflets are longer narrower and leek-green in colour. Also this tree has a smooth bark, which is dry thin and red in colour. The roots are matted stout and shallow.[4] As to the fruit, the people of Ida supposed it to have none, and no flower either; however it has a nut-like fruit in a thin pod, like the fruit of the almond, and it is somewhat bitter in taste. And it also bears certain other things like winter-buds, as does the bay, but they are more solid,[5] and each separate one is globular, like those of the plane; some of these occur around the fruit, some, in fact the greater number,[6] are at a distance from it. The smooth kind[7] grows mostly in deep ravines and damp places, the rough kind occurs also in dry and rocky parts. Some, for instance the Macedonians, call the

[2] *βραχέα* conj. Scal. from G; *τραχέα* UAld.H.

[4] Bod. inserts *οὐ* before *μετέωρον*; *cf.* 3. 6. 5. (Idaean account.)

[5] *στιφρότερα* conj. Dalec.; *στρυφνότερα* MSS.

[6] *πλεῖστα* conj. R. Const.; *πλεκτὰ* UMVAld.

[7] *cf.* Plin., *l.c.*

τὴν δὲ βουμέλιον, ὥσπερ οἱ περὶ Μακεδονίαν. μεῖζον δὲ καὶ μανότερον ἡ βουμέλιος, δι' ὃ καὶ ἧττον οὖλον. φύσει δὲ τὸ μὲν πεδεινὸν καὶ τραχύ, τὸ δ' ὀρεινὸν καὶ λεῖον· ἔστι δὲ ἡ μὲν ἐν τοῖς ὄρεσι φυομένη εὔχρους καὶ λεία καὶ στερεὰ καὶ γλίσχρα, ἡ δ' ἐν τῷ πεδίῳ ἄχρους καὶ μανὴ καὶ τραχεῖα. (τὸ δ' ὅλον ὡς εἰπεῖν τὰ δένδρα ὅσα καὶ ἐν τῷ πεδίῳ καὶ ἐν τῷ ὄρει φύεται, τὰ μὲν ὀρεινὰ εὔχροά τε καὶ στερεὰ καὶ λεῖα γίνεται, καθάπερ ὀξύη πτελέα τὰ ἄλλα· τὰ δὲ πεδεινὰ μανότερα καὶ ἀχρούστερα καὶ χείρω, πλὴν ἀπίου καὶ μηλέας καὶ ἀχράδος, ὡς οἱ περὶ τὸν Ὄλυμπόν φασι· ταῦτα δ' ἐν τῷ πεδίῳ κρείττω καὶ τῷ καρπῷ καὶ τοῖς ξύλοις· ἐν μὲν γὰρ τῷ ὄρει τραχεῖς καὶ ἀκανθώδεις καὶ ὀζώδεις εἰσίν, ἐν δὲ τῷ πεδίῳ λειότεροι καὶ μείζους καὶ τὸν καρπὸν ἔχουσι γλυκύτερον καὶ σαρκωδέστερον· μεγέθει δὲ αἰεὶ μείζω τὰ πεδεινά.)

XII. Κρανείας δὲ τὸ μὲν ἄρρεν τὸ δὲ θῆλυ, ἣν δὴ καὶ θηλυκρανείαν καλοῦσιν. ἔχουσι δὲ φύλλον μὲν ἀμυγδαλῇ ὅμοιον, πλὴν λιπωδέστερον καὶ παχύτερον, φλοιὸν δ' ἰνώδη λεπτόν· τὸ δὲ στέλεχος οὐ παχὺ λίαν, ἀλλὰ παραφύει ῥάβδους ὥσπερ ἄγνος· ἐλάττους δὲ ἡ θηλυκρανεία καὶ θαμνωδέστερόν ἐστιν. τοὺς δὲ ὄζους ὁμοίως ἔχουσιν ἄμφω τῇ ἄγνῳ καὶ κατὰ δύο καὶ κατ'

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[1] *cf.* Plin., *l.c.*, and Index.

[2] μεῖζον δὲ καὶ μανότερον conj. W. from G ; μ. δὲ καὶ μανότερα MVU (? μανότερον) ; μείζων δὲ καὶ μακροτέρα Ald.H.

one 'ash' (manna-ash), the other 'horse-ash[1]' (ash). The 'horse-ash' is a larger and more spreading[2] tree, wherefore it is of less compact appearance. It is naturally a tree of the plains and rough, while the other belongs to the mountains and is smooth[3]; the one which grows on the mountains is fair-coloured smooth hard and stunted, while that of the plains is colourless spreading and rough. (In general one may say of trees that grow in the plain and on the mountain respectively, that the latter are of fair colour hard and smooth,[4] as beech elm and the rest; while those of the plain are more spreading, of less good colour and inferior, except the pear apple[5] and wild pear, according to the people of Mount Olympus. These when they grow in the plain are better both in fruit and in wood; for on the mountain they are rough spinous and much branched, in the plain smoother larger and with sweeter and fleshier fruit. However the trees of the plain are always of larger size.)

Of cornelian cherry, cornel, 'cedars,' medlar, thorns, sorb.

XII. Of the cornelian cherry there is a 'male' and a 'female' kind (cornel), and the latter bears a corresponding name. Both have a leaf like that of the almond, but oilier and thicker; the bark is fibrous and thin, the stem is not very thick, but it puts out side-branches like the chaste-tree, those of the 'female' tree, which is more shrubby, being fewer. Both kinds have branches like those of the chaste-tree,

[3] καὶ τραχὺ . . . λεῖον conj. Sch.; καὶ λεῖον . . . τραχὺ Ald.
[4] λεῖα conj. Mold.; λευκὰ Ald.G.
[5] μηλέας conj. Scal., *cf.* 3. 3. 2; μελίας UMAld.H.

ἀλλήλους· τὸ δὲ ξύλον τὸ μὲν τῆς κρανείας ἀκάρδιον καὶ στερεὸν ὅλον, ὅμοιον κέρατι τὴν πυκνότητα καὶ τὴν ἰσχύν, τὸ δὲ τῆς θηλυκρανείας ἐντεριώνην ἔχον καὶ μαλακώτερον καὶ κοιλαινό-
2 μενον· δι' ὃ καὶ ἀχρεῖον εἰς τὰ ἀκόντια. τὸ δ' ὕψος τοῦ ἄρρενος δώδεκα μάλιστα πηχέων, ἡλίκη τῶν σαρισσῶν ἡ μεγίστη· τὸ γὰρ ὅλον στέλεχος ὕψος οὐκ ἴσχει. φασὶ δ' οἱ μὲν ἐν τῇ Ἰδῃ τῇ Τρωάδι τὸ μὲν ἄρρεν ἄκαρπον εἶναι τὸ δὲ θῆλυ κάρπιμον. πυρῆνα δ' ὁ καρπὸς ἔχει παραπλήσιον ἐλάᾳ, καὶ ἐσθιόμενος γλυκὺς καὶ εὐώδης· ἄνθος δὲ ὅμοιον τῷ τῆς ἐλάας, καὶ ἀπανθεῖ δὲ καὶ καρποφορεῖ τὸν αὐτὸν τρόπον τῷ ἐξ ἑνὸς μίσχου πλείους ἔχειν, σχεδὸν δὲ καὶ τοῖς χρόνοις παραπλησίως. οἱ δ' ἐν Μακεδονίᾳ καρποφορεῖν μὲν ἄμφω φασὶν τὸν δὲ τῆς θηλείας ἄβρωτον εἶναι· τὰς ῥίζας δ' ὁμοίας ἔχει ταῖς ἄγνοις ἰσχυρὰς καὶ ἀνωλέθρους. γίνεται δὲ καὶ περὶ τὰ ἕφυδρα καὶ οὐκ ἐν τοῖς ξηροῖς μόνον· φύεται δὲ καὶ ἀπὸ σπέρματος καὶ ἀπὸ παρασπάδος.

3 Κέδρον δὲ οἱ μέν φασιν εἶναι διττήν, τὴν μὲν Λυκίαν τὴν δὲ Φοινικῆν, οἱ δὲ μονοειδῆ, καθάπερ οἱ ἐν τῇ Ἰδῃ. παρόμοιον δὲ τῇ ἀρκεύθῳ, διαφέρει δὲ μάλιστα τῷ φύλλῳ· τὸ μὲν γὰρ τῆς κέδρου σκληρὸν καὶ ὀξὺ καὶ ἀκανθῶδες, τὸ δὲ τῆς ἀρκεύθου μαλακώτερον· δοκεῖ δὲ καὶ ὑψηλοφυέστερον εἶναι ἡ ἄρκευθος· οὐ μὴν ἀλλ' ἔνιοί γε οὐ διαιροῦσι

[1] The Idaeans are evidently responsible for this statement. T. himself (3. 4. 3) says the fruit is inedible.

[2] But (1. 11. 4) only certain varieties of the olive are said to have this character: the next statement seems also inconsistent with 3. 4. 3. Perhaps T. is still reproducing his Idaean authority.

arranged in pairs opposite one another. The wood of the 'male' tree has no heart, but is hard throughout, like horn in closeness and strength; whereas that of the 'female' tree has heart-wood and is softer and goes into holes; wherefore it is useless for javelins. The height of the 'male' tree is at most twelve cubits, the length of the longest Macedonian spear, the stem up to the point where it divides not being very tall. The people of Mount Ida in the Troad say that the 'male' tree is barren, but that the 'female' bears fruit. The fruit has a stone like an olive and is sweet to the taste and fragrant[1]; the flower is like that of the olive, and the tree produces its flowers and fruit in the same manner, inasmuch as it has several growing from one stalk,[2] and they are produced at almost the same time in both forms. However the people of Macedonia say that both trees bear fruit, though that of the 'female' is uneatable, and the roots are like those of the chaste-tree, strong and indestructible. This tree grows in wet ground and not only[3] in dry places; and it comes from seed, and also can be propagated from a piece torn off.

[4]The 'cedar,' some say, has two forms, the Lycian and the Phoenician[5]; but some, as the people of Mount Ida, say that there is only one form. It resembles the *arkeuthos* (Phoenician cedar), differing chiefly in the leaf, that of 'cedar' being hard sharp and spinous, while that of *arkeuthos* is softer: the latter tree also seems to be of taller growth. However some do not give them distinct names, but call

[3] *μόνον* ins. R. Const. from G.
[4] Plin. 13. 52. See Index *κέδρος* and *ἄρκευθος*.
[5] *Φοινικῆν*: *Φοινικικὴν* conj. W. *cf.* 9. 2. 3; Plin. *l.c.*

τοῖς ὀνόμασιν ἀλλ' ἄμφω καλοῦσι κέδρους, πλὴν παρασήμως τὴν κέδρον ὀξύκεδρον. ὀζώδη δ' ἄμφω καὶ πολυμάσχαλα καὶ ἐπεστραμμένα ἔχοντα τὰ ξύλα· μήτραν δ' ἡ μὲν ἄρκευθος ἔχει μικρὰν καὶ πυκνὴν καὶ ὅταν κοπῇ ταχὺ σηπομένην· ἡ δὲ κέδρος τὸ πλεῖστον ἐγκάρδιον καὶ ἀσαπές, ἐρυθροκάρδια δ' ἄμφω· καὶ ἡ μὲν τῆς
4 κέδρου εὐώδης ἡ δὲ τῆς ἑτέρας οὔ. καρπὸς δ' ὁ μὲν τῆς κέδρου ξανθὸς μύρτου μέγεθος ἔχων εὐώδης ἡδὺς ἐσθίεσθαι. ὁ δὲ τῆς ἀρκεύθου τὰ μὲν ἄλλα ὅμοιος, μέλας δὲ καὶ στρυφνὸς καὶ ὥσπερ ἄβρωτος· διαμένει δ' εἰς ἐνιαυτόν, εἶθ' ὅταν ἄλλος ἐπιφυῇ ὁ περυσινὸς ἀποπίπτει. ὡς δὲ οἱ ἐν Ἀρκαδίᾳ λέγουσι, τρεῖς ἅμα καρποὺς ἴσχει, τόν τε περυσινὸν οὔπω πέπονα καὶ τὸν προπερύσινον ἤδη πέπονα καὶ ἐδώδιμον καὶ τρίτον τὸν νέον ὑποφαίνει. ἔφη δὲ Σάτυρος καὶ κομίσαι τοὺς ὀρεοτύπους αὐτῷ ἀνανθεῖς ἄμφω. τὸν δὲ φλοιὸν ὅμοιον ἔχει κυπαρίττῳ τραχύτερον δέ· ῥίζας δὲ μανὰς ἀμφότεραι καὶ ἐπιπολαίους. φύονται περὶ τὰ πετρώδη καὶ χειμέρια καὶ τούτους τοὺς τόπους ζητοῦσι.

5 Μεσπίλης δ' ἐστὶ τρία γένη, ἀνθηδὼν σατάνειος ἀνθηδονοειδής, ὡς οἱ περὶ τὴν Ἴδην διαιροῦσι. φέρει δὲ ἡ μὲν σατάνειος τὸν καρπὸν μείζω καὶ λευκότερον καὶ χαυνότερον καὶ τοὺς πυρῆνας ἔχοντα μαλακωτέρους· αἱ δ' ἕτεραι

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1 παρασήμως τὴν κέδρον U ; π. τὸν κέδρον M ; Ald. omits the article ; παρασημασίᾳ κέδρου conj. W.

2 μήτραν conj. Sch. ; μᾶλλον UMVAld. Plin., 16. 198, supports μήτραν : he apparently read μήτραν δ' ἡ μὲν ἀ. ἔχει μᾶλλον

them both 'cedar,' distinguishing them however as 'the cedar'[1] and 'prickly cedar.' Both are branching trees with many joints and twisted wood. On the other hand *arkeuthos* has only a small amount of close core,[2] which, when the tree is cut, soon rots, while the trunk of 'cedar' consists mainly of heart and does not rot. The colour of the heart in each case is red: that of the 'cedar' is fragrant, but not that of the other. The fruit of 'cedar' is yellow, as large as the myrtle-berry, fragrant, and sweet to the taste. That of *arkeuthos* is like it in other respects, but black, of astringent taste and practically uneatable; it remains on the tree for a year, and then, when another grows, last year's fruit falls off. According to the Arcadians it has three fruits on the tree at once, last year's, which is not yet ripe, that of the year before last which is now ripe and eatable, and it also shews the new fruit. Satyrus[3] said that the wood-cutters gathered him specimens of both kinds which were flowerless. The bark is[4] like that of the cypress but rougher. Both[5] kinds have spreading shallow roots. These trees grow in rocky cold parts and seek out such districts.

[6] There are three kinds of *mespile, anthedon* (oriental thorn), *sataneios* (medlar) and *anthedonoeides* (hawthorn), as the people of mount Ida distinguish them. [7] The fruit of the medlar is larger paler more spongy and contains softer stones; in the other

τυκνήν; but the words καὶ ὅταν . . . σηπομένην (which P. does not render) seem inconsistent. ? ins. οὐ before ταχὺ Sch.

[3] ? An enquirer sent out by the Lyceum: see Intr. p. xxi.

[4] ἔχει conj. W.; ἐδόκει Ald.

[5] ἀμφότεραι conj. W.; ἀμφοτέρας U; ἀμφοτέρους Ald. H.

[6] Plin. 15. 84.

[7] *cf. C.P.* 2. 8. 2; 6. 14. 4; 6. 16. 1.

ἐλάττω τέ τι καὶ εὐωδέστερον καὶ στρυφνότερον, ὥστε δύνασθαι πλείω χρόνον θησαυρίζεσθαι. πυκνότερον δὲ καὶ τὸ ξύλον τούτων καὶ ξανθότερον, τὰ δ' ἄλλα ὅμοιον. τὸ δ' ἄνθος πασῶν ὅμοιον ἀμυγδαλῇ, πλὴν οὐκ ἐρυθρὸν ὥσπερ ἐκεῖνο ἀλλ' ἐγχλωρότερον. . . . . μεγέθει μέγα τὸ δένδρον καὶ περίκομον. φύλλον δὲ τὸ μὲν ἐπὶ . . . . . πολυσχιδὲς δὲ καὶ ἐν ἄκρῳ σελινοειδές, τὸ δ' ἐπὶ τῶν παλαιοτέρων πολυσχιδὲς σφόδρα καὶ ἐγγωνοειδὲς μείζοσι σχίσμασι, τετανὸν ἰνῶδες λεπτότερον σελίνου καὶ προμηκέστερον καὶ τὸ ὅλον καὶ τὰ σχίσματα, περικεχαραγμένον δὲ ὅλον· μίσχον δ' ἔχει λεπτὸν μακρόν· πρὸ τοῦ φυλλορροεῖν δ' ἐρυθραίνεται σφόδρα. πολύρριζον δὲ τὸ δένδρον καὶ βαθύρριζον· δι' ὃ καὶ χρόνιον καὶ δυσώλεθρον. καὶ τὸ ξύλον ἔχει πυκνὸν καὶ
6 στερεὸν καὶ ἀσαπές. φύεται δὲ καὶ ἀπὸ σπέρματος καὶ ἀπὸ παρασπάδος. νόσημα δὲ αὐτῶν ἐστιν ὥστε γηράσκοντα σκωληκόβρωτα γίνεσθαι· καὶ οἱ σκώληκες μεγάλοι καὶ ἴδιοι ἢ οἱ ἐκ τῶν δένδρων τῶν ἄλλων.

Τῶν δ' οἰῶν δύο γένη ποιοῦσι, τὸ μὲν δὴ καρποφόρον θῆλυ τὸ δὲ ἄρρεν ἄκαρπον· οὐ μὴν ἀλλὰ διαφέρουσι τοῖς καρποῖς, τῷ τὰς μὲν στρογγύλον τὰς δὲ προμήκη τὰς δ' ὠοειδῆ φέρειν. διαφέρουσι δὲ καὶ τοῖς χυλοῖς· ὡς γὰρ ἐπὶ τὸ

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[1] ἐλάττω τέ τι conj. W.; ἐλάττω εἰσὶ UAld.

[2] W. suggests that some words are missing here, as it does not appear to which kind of μεσπίλη the following description belongs; hence various difficulties. See Sch.

[3] Probably a lacuna in the text. W. thus supplies the sense: he suggests σικυοειδές for σελινοειδές.

kinds it is somewhat smaller,[1] more fragrant and of more astringent taste, so that it can be stored for a longer time. The wood also of these kinds is closer and yellower, though in other respects it does not differ. The flower in all the kinds is like the almond flower, except that it is not pink, as that is, but greenish . . . . .[2] In stature the tree is large and it has thick foliage. The leaf in the young tree is round[3] but much divided and like celery at the tip; but the leaf of older trees is very much divided and forms angles with larger divisions; it is smooth[4] fibrous thinner and more oblong than the celery leaf, both as a whole and in its divisions, and it has a jagged edge all round.[5] It has a long thin stalk, and the leaves turn bright red before they are shed. The tree has many roots, which run deep; wherefore it lives a long time and is hard to kill. The wood is close and hard and does not rot. The tree grows from seed and also from a piece torn off. It is subject to a disease which causes it to become worm-eaten[6] in its old age, and the worms are large and different[7] to those engendered by other trees.

[8]Of the sorb they make two kinds, the 'female' which bears fruit and the 'male' which is barren. There are moreover differences in the fruit of the 'female' kind; in some forms it is round, in others oblong and egg-shaped. There are also differences

[1] *τετανὸν*: *cf.* 3. 11. 1; 3. 15. 6.

[2] *περικεχαραγμένον* conj. Scal.; *περικεθαρμένον* U; *περικεκαρμένον* MVAld. *cf.* allusions to the leaf of *μεσπίλη*, 3. 13. 1; 3. 15. 6.

[3] *cf.* 4. 14. 10; Plin. 17. 221; Pall. 4. 10.

[4] *ἴδιοι* Ald. (for construction *cf.* Plat. *Gorg.* 481 c); *ἰδίους* UMV (the first *ι* corrected in U). W. adopts Sch.'s conj., *ἡδίους*, in allusion to the edible *cossus*: *cf.* Plin. *l.c.*

[5] Plin. 15. 85.

πᾶν εὐωδέστερα καὶ γλυκύτερα τὰ στρογγύλα, τὰ δ' ὠοειδῆ πολλάκις ἐστὶν ὀξέα καὶ ἧττον
7 εὐώδη. φύλλα δ' ἀμφοῖν κατὰ μίσχον μακρὸν ἰνοειδῆ πεφύκασι στοιχηδὸν ἐκ τῶν πλαγίων πτερυγοειδῶς, ὡς ἑνὸς ὄντος τοῦ ὅλου λοβοὺς δὲ ἔχοντος ἐσχισμένους ἕως τῆς ἰνός· πλὴν διεστᾶσιν ἀφ' ἑαυτῶν ὑπόσυχνον τὰ κατὰ μέρος· φυλλοβολεῖ δὲ οὐ κατὰ μέρος ἀλλὰ ὅλον ἅμα τὸ πτερυγῶδες. εἰσὶ δὲ περὶ μὲν τὰ παλαιότερα καὶ μακρότερα πλείους αἱ συζυγίαι, περὶ δὲ τὰ νεώτερα καὶ βραχύτερα ἐλάττους, πάντων δὲ ἐπ' ἄκρου τοῦ μίσχου φύλλον περιττόν, ὥστε καὶ πάντ' εἶναι περιττά. τῷ δὲ σχήματι δαφνοειδῆ τῆς λεπτοφύλλου, πλὴν χαραγμὸν ἔχοντα καὶ βραχύτερα καὶ οὐκ εἰς ὀξὺ τὸ ἄκρον συνῆκον ἀλλ' εἰς περιφερέστερον. ἄνθος δὲ ἔχει βοτρυῶδες ἀπὸ μιᾶς κορύνης ἐκ πολλῶν μικρῶν καὶ
8 λευκῶν συγκείμενον. καὶ ὁ καρπὸς ὅταν εὐκαρπῇ βοτρυώδης· πολλὰ γὰρ ἀπὸ τῆς αὐτῆς κορύνης, ὥστ' εἶναι καθάπερ κηρίον. σκωληκόβορος ἐπὶ τοῦ δένδρου ὁ καρπὸς ἄπεπτος ὢν ἔτι γίνεται μᾶλλον τῶν μεσπίλων καὶ ἀπίων καὶ ἀχράδων· καίτοι πολὺ στρυφνότατος. γίνεται δὲ καὶ αὐτὸ τὸ δένδρον σκωληκόβρωτον καὶ οὕτως αὐαίνεται γηράσκον· καὶ ὁ σκώληξ ἴδιος ἐρυθρὸς δασύς. καρποφορεῖ δ' ἐπιεικῶς νέα· τριετὴς γὰρ εὐθὺς φύει. τοῦ μετοπώρου δ' ὅταν ἀποβάλῃ τὸ φύλλον, εὐθὺς ἴσχει τὴν καχρυώδη κορύνην λιπαρὰν καὶ

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[1] φύλλα . . . στοιχηδὸν conj. W.; φύλλον δ' ἀμφοῖν τὸ μὲν μίσχον μακρὸν ἰνοειδῆ· πεφ. [δὲ] στοιχηδὸν UMVAld.

[2] ἀφ' ἑαυτῶν (=ἀπ' ἀλλήλων) conj. Scal.; ἀπ' αὐτῶν U: so W., who however renders *inter se*.

in taste; the round fruits are generally more fragrant and sweeter, the oval ones are often sour and less fragrant. The leaves in both grow attached to a long fibrous stalk, and project on each side in a row[1] like the feathers of a bird's wing, the whole forming a single leaf but being divided into lobes with divisions which extend to the rib; but each pair are some distance apart,[2] and, when the leaves fall,[3] these divisions do not drop separately, but the whole wing-like structure drops at once. When the leaves are older and longer, the pairs are more numerous; in the younger and shorter leaves they are fewer; but in all at the end of the leaf-stalk there is an extra leaflet, so that the total number of leaflets is an odd number. In form the leaflets resemble[4] the leaves of the 'fine-leaved' bay, except that they are jagged and shorter and do not narrow to a sharp point but to a more rounded end. The flower[5] is clustering and made up of a number of small white blossoms from a single knob. The fruit too is clustering, when the tree fruits well; for a number of fruits are formed from the same knob, giving an appearance like a honeycomb. The fruit gets eaten by worms on the tree before it is ripe to a greater extent than that of medlar pear or wild pear, and yet it is much more astringent than any of these. The tree itself also gets worm-eaten, and so withers away as it ages; and the worm[6] which infests it is a peculiar one, red and hairy. This tree bears fruit when it is quite young, that is as soon as it is three years old. In autumn, when it has shed its leaves, it immediately produces its winter-bud-like knob,[7]

[3] Plin. 16. 92.
[4] For construction *cf.* 3. 11. 3.
[5] *i.e.* inflorescence.
[6] Plin. 17. 221.
[7] *cf.* 3. 5. 5.

ἐπωδηκυῖαν ὡσὰν ἤδη βλαστικόν, καὶ διαμένει
9 τὸν χειμῶνα. ἀνάκανθον δέ ἐστι καὶ ἡ οἴη καὶ ἡ μεσπίλη· φλοιὸν δ' ἔχει λεῖον ὑπολίπαρον, ὅσαπερ μὴ γεράνδρυα, τὴν δὲ χρόαν ξανθὸν ἐπιλευκαίνοντα· τὰ δὲ γεράνδρυα τραχὺν καὶ μέλανα. τὸ δὲ δένδρον εὐμέγεθες ὀρθοφυὲς εὔρυθμον τῇ κόμῃ· σχεδὸν γὰρ ὡς ἐπὶ τὸ πολὺ στροβιλοειδὲς σχῆμα λαμβάνει κατὰ τὴν κόμην, ἐὰν μή τι ἐμποδίσῃ. τὸ δὲ ξύλον στερεὸν πυκνὸν ἰσχυρὸν εὔχρουν, ῥίζας δὲ οὐ πολλὰς μὲν οὐδὲ κατὰ βάθους, ἰσχυρὰς δὲ καὶ παχείας καὶ ἀνωλέθρους ἔχει. φύεται δὲ καὶ ἀπὸ ῥίζης καὶ ἀπὸ παρασπάδος καὶ ἀπὸ σπέρματος· τόπον δὲ ζητεῖ ψυχρὸν ἔνικμον, φιλόζωον δ' ἐν τούτῳ καὶ δυσώλεθρον· οὐ μὴν ἀλλὰ καὶ φύεται ἐν τοῖς ὄρεσιν.

XIII. Ἴδιον δὲ τῇ φύσει δένδρον ὁ κέρασός ἐστι· μεγέθει μὲν μέγα· καὶ γὰρ εἰς τέτταρας καὶ εἴκοσι πήχεις· ἔστι δ' ὀρθοφυὲς σφόδρα· πάχος δὲ ὥστε καὶ δίπηχυν τὴν περίμετρον ἀπὸ τῆς ῥίζης ἔχειν. φύλλον δ' ὅμοιον τῷ τῆς μεσπίλης σκληρὸν δὲ σφόδρα καὶ παχύτερον, ὥστε τῇ χροιᾷ πόρρωθεν φανερὸν εἶναι τὸ δένδρον. φλοιὸν δὲ τὴν λειότητα καὶ τὴν χρόαν καὶ τὸ πάχος ὅμοιον φιλύρᾳ, δι' ὃ καὶ τὰς κίστας ἐξ αὐτοῦ ποιοῦσιν ὥσπερ καὶ ἐκ τοῦ τῆς φιλύρας. περιπέφυκε δὲ οὗτος οὔτε ὀρθοφυὴς οὔτε κύκλῳ κατ' ἴσον, ἀλλ' ἑλικηδὸν περιείληφε κάτωθεν ἄνω

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[1] ὅσαπερ μὴ conj. Bod.; ὥσπερ τὰ Ald; ὥστε τὰ M.
[2] κόμην Ald.H.; κορυφὴν conj. Sch.; *vertice* G.
[3] Plin. 16. 125; *cf.* 16. 74; 17. 234.
[4] παχύτερον: so quoted by Athen. 2. 34; πλατύτερον MSS.

which is glistening and swollen as though the tree were just about to burst into leaf, and this persists through the winter. The sorb, like the medlar, is thornless; it has smooth rather shiny bark, (except when[1] the tree is old), which in colour is a whitish yellow; but in old trees it is rough and black. The tree is of a good size, of erect growth and with well balanced foliage; for in general it assumes a cone-like shape as to its foliage,[2] unless something interferes. The wood is hard close strong and of a good colour; the roots are not numerous and do not run deep, but they are strong and thick and indestructible. The tree grows from a root, from a piece torn off, or from seed, and seeks a cold moist position; in such a position it is tenacious of life and hard to kill: however it also grows on mountains.

Of bird-cherry, elder, willow.

XIII. [3] The *kerasos* (bird-cherry) is peculiar in character; it is of great stature, growing as much as twenty-four cubits high; and it is of very erect growth; as to thickness, it is as much as two cubits in circumference at the base. The leaves are like those of the medlar, but very tough and thicker,[4] so that the tree is conspicuous by its colour from a distance. The bark [5] in smoothness colour and thickness is like that of the lime; wherefore men make their writing-cases [6] from it, as from the bark of that tree. [7] This bark does not grow straight nor evenly all round the tree, but runs round it [8] in a spiral

[5] *cf.* 4. 15. 1; Hesych. *s.v.* *κέρασος*.
[6] *cf.* 3. 10. 4; Ar. *Vesp.* 529.
[7] *περιπέφυκε . . . περιπεφυκός*: text as restored by Sch. and others, following U as closely as possible.
[8] *περιείληφε* conj. R. Const.

προσάγων, ὥσπερ ἡ διαγραφὴ τῶν φύλλων· καὶ λοπιζόμενος οὗτος ἐκδέρεται, ἐκεῖνος δ' ἐπίτομος
2 γίνεται καὶ οὐ δύναται· μέρος δ' αὐτοῦ τι τὸν αὐτὸν τρόπον ἀφαιρεῖται κατὰ πάχος σχιζόμενον λεπτὸν ὡς ἂν φύλλον, τὸ δὲ λοιπὸν προσμένειν τε δύναται καὶ σώζει τὸ δένδρον ὡσαύτως περιπεφυκός. περιαιρουμένου δὲ ὅταν λοπᾷ τοῦ φλοιοῦ συνεκραίνει καὶ τότε τὴν ὑγρότητα· καὶ ὅταν ὁ ἔξω χιτὼν περιαιρεθῇ, μόνον ὁ ὑπολιπὴς ἐπιμελαίνεται ὥσπερ μυξώδει ὑγρασίᾳ, καὶ πάλιν ὑποφύεται τῷ δευτέρῳ ἔτει χιτὼν ἄλλος ἀντ' ἐκείνου πλὴν λεπτότερος. πέφυκε καὶ τὸ ξύλον ὅμοιον ταῖς ἰσὶ τῷ φλοιῷ στρεπτῶς ἑλιττόμενον· καὶ οἱ ῥάβδοι φύονται τὸν αὐτὸν τρόπον εὐθύς· τοὺς ὄζους δ' αὐξανομένου συμβαίνει τοὺς μὲν
3 κάτω ἀεὶ ἀπόλλυσθαι τοὺς δ' ἄνω αὔξειν. τὸ δ' ὅλον οὐ πολύοζον τὸ δένδρον ἀλλ' ἀνοζότερον πολὺ τῆς αἰγείρου. πολύρριζον δὲ καὶ ἐπιπολαιόρριζον οὐκ ἄγαν δὲ παχύρριζον· ἡ δ' ἐπιστροφὴ καὶ τῆς ῥίζης καὶ τοῦ φλοιοῦ τοῦ περὶ αὐτὴν ἡ αὐτή. ἄνθος δὲ λευκὸν ἀπίῳ καὶ μεσπίλῃ ὅμοιον, ἐκ μικρῶν ἀνθῶν συγκείμενον κηριῶδες. ὁ δὲ καρπὸς ἐρυθρὸς ὅμοιος διοσπύρῳ τὸ σχῆμα, τὸ δὲ μέγεθος ἡλίκον κύαμος, πλὴν τοῦ διοσπύρου μὲν ὁ πυρὴν σκληρὸς τοῦ δὲ κεράσου μαλακός. φύεται δ' ὅπου καὶ ἡ φίλυρα, τὸ δὲ ὅλον ὅπου ποταμοὶ καὶ ἔφυδρα.

4 Φύεται δὲ καὶ ἡ ἀκτὴ μάλιστα παρ' ὕδωρ καὶ

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[1] Which is an ellipse, the segment of a cylinder: so Sch. explains.

[2] ἐκεῖνος: *i.e.* lower down the trunk, where the spiral is less open. [3] ἐπίτομος: *cf.* 5. 1. 12.

(which becomes closer as it gets higher up the tree) like the outline of the leaves.[1] And this part of it can be stripped off by peeling, whereas with the other part[2] this is not possible and it has to be cut in short lengths.[3] In the same manner part is removed by being split off in flakes as thin as a leaf, while the rest can be left and protects the tree, growing about it as described. If the bark is stripped off when the tree is peeling, there is also at the time a discharge of the sap; further, when only the outside coat is stripped off, what remains turns black with a kind[4] of mucus-like moisture; and in the second year another coat grows to replace what is lost, but this is thinner. The wood in its fibres is like the bark, twisting spirally,[5] and the branches grow in the same manner from the first; and, as the tree grows, it comes to pass that the lower branches keep on perishing, while the upper ones increase. However the whole tree is not much branched, but has far fewer branches than the black poplar. Its roots are numerous and shallow and not very thick; and there is a similar twisting of the root and of the bark which surrounds it. [6]The flower is white, like that of the pear and medlar, composed of a number of small blossoms arranged like a honeycomb. The fruit is red, like that of *diospyros* in shape, and in size it is as large as a bean. However the stone of the *diospyros* fruit is hard, while that of the bird-cherry is soft. The tree grows where the lime grows, and in general where there are rivers and damp places.

[7]The elder also grows chiefly by water and in shady

[1] ἅσπερ conj. Sch.; περ MV; πως Ald.H.
[2] στρεπτῶς ἑλιττόμενον conj. Sch.; στρεπτῷ ἑλιττομένωι U; στρεπτῷ ἑλιττομένῳ Ald. [3] *cf.* 3. 12. 7. [4] Plin. 17. 151.

ἐν τοῖς σκιεροῖς, οὐ μὴν ἀλλὰ καὶ ἐν τοῖς μὴ τοιούτοις· θαμνῶδες δὲ ῥάβδοις ἐπετείοις αὐξανομέναις μέχρι τῆς φυλλορροίας εἰς μῆκος, εἶτα μετὰ ταῦτα εἰς πάχος· τὸ δὲ ὕψος τῶν ῥάβδων οὐ μέγα λίαν ἀλλὰ καὶ μάλιστα ὡς ἐξάπηχυ· τῶν δὲ στελεχῶν πάχος τῶν γερανδρύων ὅσον περικεφαλαίας, φλοιὸς δὲ λεῖος λεπτὸς καπυρός· τὸ δὲ ξύλον χαῦνον καὶ κοῦφον ξηρανθέν, ἐντεριώνην δὲ ἔχον μαλακήν, ὥστε δι' ὅλου καὶ κοιλαίνεσθαι τὰς ῥάβδους, ἐξ ὧν καὶ τὰς βακτηρίας ποιοῦσι τὰς κούφας. ξηρανθὲν δὲ ἰσχυρὸν καὶ ἀγήρων ἐὰν βρέχηται, κἂν ᾖ λελοπισμένον· λοπίζεται δὲ αὐτόματον ξηραινόμενον. ῥίζας δὲ ἔχει μετεώρους οὐ πολλὰς δὲ οὐδὲ μεγάλας.

5 φύλλον δὲ τὸ μὲν καθ' ἕκαστον μαλακόν, πρόμηκες ὡς τὸ τῆς πλατυφύλλου δάφνης, μεῖζον δὲ καὶ πλατύτερον καὶ περιφερέστερον ἐκ μέσου καὶ κάτωθεν, τὸ δ' ἄκρον εἰς ὀξὺ μᾶλλον συνῆκον κύκλῳ δ' ἔχον χαραγμόν· τὸ δὲ ὅλον, περὶ ἕνα μίσχον παχὺν καὶ ἰνώδη ὡσὰν κλωνίον τὰ μὲν ἔνθεν τὰ δὲ ἔνθεν κατὰ γόνυ καὶ συζυγίαν πεφύκασι τῶν φύλλων διέχοντα ἀπ' ἀλλήλων, ἓν δὲ ἐξ ἄκρου τοῦ μίσχου. ὑπέρυθρα δὲ τὰ φύλλα ἐπιεικῶς καὶ χαῦνα καὶ σαρκώδη· φυλλορροεῖ δὲ τοῦτο ὅλον, διόπερ φύλλον ἄν τις εἴποι τὸ ὅλον. ἔχουσι δὲ καὶ οἱ κλῶνες οἱ νέοι γωνοειδῆ τινα.

6 τὸ δ' ἄνθος λευκὸν ἐκ μικρῶν λευκῶν πολλῶν ἐπὶ τῇ τοῦ μίσχου σχίσει κηριῶδες· εὐωδίαν

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[1] περικεφαλαίας, some part of a ship's prow : so Pollux.
[2] καπυρός conj. Sch.; καὶ πυρσός U (?) ; καὶ πυρρός V; καὶ πουρός M. [3] Sc. pith.

places, but likewise in places which are not of this character. It is shrubby, with annual branches which go on growing in length till the fall of the leaf, after which they increase in thickness. The branches do not grow to a very great height, about six cubits at most. The thickness of the stem of old trees is about that of the 'helmet'[1] of a ship; the bark is smooth thin and brittle[2]; the wood is porous and light when dried, and has a soft heart-wood,[3] so that the boughs are hollow right through, and men make of them their light walking-sticks. When dried it is strong and durable if it is soaked, even if it is stripped of the bark; and it strips itself of its own accord as it dries. The roots are shallow and neither numerous nor large. The single leaflet is soft and oblong, like the leaf of the 'broad-leaved' bay, but larger broader and rounder at the middle and base, though the tip narrows more to a point and is jagged[4] all round. The whole leaf is composed of leaflets growing about a single thick fibrous stalk, as it were, to which they are attached at either side in pairs at each joint; and they are separate from one another, while one is attached to the tip of the stalk. The leaves are somewhat reddish porous and fleshy: the whole is shed in one piece; wherefore one may consider the whole structure as a 'leaf.'[5] The young twigs too have certain crooks[6] in them. The flower[7] is white, made up of a number of small white blossoms attached to the point where the stalk divides, in form like a honeycomb, and it has the heavy

[4] *χαραγμόν* conj. R. Const. from G; *παραγμόν* UMV; *σπαραγμόν* Ald.

[5] *cf.* 3. 11. 3 n.

[6] *γωνοειδῆ* U; ? *γωνιοειδῆ*; G seems to have read *γοναοειδῆ*; Sch. considers the text defective or mutilated.

[7] *cf.* 3. 12. 7 n.

δὲ ἔχει λειριώδη ἐπιβαρεῖαν. ἔχει δὲ καὶ τὸν καρπὸν ὁμοίως πρὸς ἐνὶ μίσχῳ παχεῖ βοτρυώδη δέ· γίνεται δὲ καταπεπαινόμενος μέλας, ὠμὸς δὲ ὢν ὀμφακώδης· μεγέθει δὲ μικρῷ μείζων ὀρόβου· τὴν ὑγρασίαν δὲ οἰνώδη τῇ ὄψει· καὶ τὰς χεῖρας τελειούμενοι βάπτονται καὶ τὰς κεφαλάς· ἔχει δὲ καὶ τὰ ἐντὸς σησαμοειδῆ τὴν ὄψιν.

7 Πάρυδρον δὲ καὶ ἡ ἰτέα καὶ πολυειδές· ἡ μὲν μέλαινα καλουμένη τῷ τὸν φλοιὸν ἔχειν μέλανα καὶ φοινικοῦν, ἡ δὲ λευκὴ τῷ λευκόν. καλλίους δὲ ἔχει τὰς ῥάβδους καὶ χρησιμωτέρας εἰς τὸ πλέκειν ἡ μέλαινα, ἡ δὲ λευκὴ καπυρωτέρας. ἔστι δὲ καὶ τῆς μελαίνης καὶ τῆς λευκῆς ἔνιον γένος μικρὸν καὶ οὐκ ἔχον αὔξησιν εἰς ὕψος, ὥσπερ καὶ ἐπ' ἄλλων τοῦτο δένδρων, οἷον κέδρου φοίνικος. καλοῦσι δ' οἱ περὶ Ἀρκαδίαν οὐκ ἰτέαν ἀλλὰ ἑλίκην τὸ δένδρον· οἴονται δέ, ὥσπερ ἐλέχθη, καὶ καρπὸν ἔχειν αὐτὴν γόνιμον.

XIV. Ἔστι δὲ τῆς πτελέας δύο γένη, καὶ τὸ μὲν ὀρειπτελέα καλεῖται τὸ δὲ πτελέα· διαφέρει δὲ τῷ θαμνωδέστερον εἶναι τὴν πτελέαν εὐαυξέστερον δὲ τὴν ὀρειπτελέαν. φύλλον δὲ ἀσχιδὲς περικεχαραγμένον ἡσυχῇ, προμηκέστερον δὲ τοῦ τῆς ἀπίου,

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[1] καταπεπαινόμενος conj. W. ; καὶ πεπ. VAld.

[2] καὶ . . . βάπτονται I conj., following Scal., W., etc., but keeping closer to U : certain restoration perhaps impossible ; καὶ τὰς χεῖρας τελείους ἀναβλάστει δὲ καὶ τὰς κεφαλάς U ; χεῖρας δὲ τελείους· ἀναβλασεῖ MV ; om. G.

[3] Plin. 16. 174 and 175.

fragrance of lilies. The fruit is in like manner attached to a single thick stalk, but in a cluster: as it becomes quite ripe,[1] it turns black, but when unripe it is like unripe grapes; in size the berry is a little larger than the seed of a vetch; the juice is like wine in appearance, and in it men bathe[2] their hands and heads when they are being initiated into the mysteries. The seeds inside the berry are like sesame.

[3] The willow also grows by the water, and there are many kinds. There is that which is called the black willow[4] because its bark is black and red, and that which is called the white[4] from the colour of its bark. The black kind has boughs which are fairer and more serviceable for basket-work, while those of the white are more brittle.[5] There is a form both of the black and of the white which is small and does not grow to a height,—just as there are dwarf forms of other trees, such as prickly cedar and palm. The people of Arcadia call the tree[6] not 'willow' but *helike*: they believe, as was said,[7] that it bears fruitful seed.

Of elm, poplars, alder, [semyda, *bladder-senna*].

XIV. [8] Of the elm there are two kinds, of which one is called the 'mountain elm,' the other simply the 'elm': the difference is that the latter is shrubbier, while the mountain elm grows more vigorously. The leaf is undivided and slightly jagged, longer than that of the pear, but rough

[1] See Index.

[5] καπυρωτέρας conj. Sch.; καὶ πυρωτέρας U; καὶ πυροτέρας MVAld. *cf.* 3. 13. 4.

[6] Sc. ἰτέα generally. [7] 3. 1. 2. [8] Plin. 16. 72.

τραχὺ δὲ καὶ οὐ λεῖον. μέγα δὲ τὸ δένδρον καὶ τῷ ὕψει καὶ τῷ μεγέθει. πολὺ δ' οὐκ ἔστι περὶ τὴν Ἴδην ἀλλὰ σπάνιον· τόπον δὲ ἔφυδρον φιλεῖ. τὸ δὲ ξύλον ξανθὸν καὶ ἰσχυρὸν καὶ εὔινον καὶ γλίσχρον· ἅπαν γὰρ καρδία· χρῶνται δ' αὐτῷ καὶ πρὸς θυρώματα πολυτελῆ, καὶ χλωρὸν μὲν εὔτομον ξηρὸν δὲ δύστομον. ἄκαρπον δὲ νομίζουσιν, ἀλλ' ἐν ταῖς κωρυκίσι τὸ κόμμι καὶ θηρί' ἄττα κωνωποειδῆ φέρει. τὰς δὲ κάχρυς ἰδίας ἴσχει τοῦ μετοπώρου πολλὰς καὶ μικρὰς καὶ μελαίνας, ἐν δὲ ταῖς ἄλλαις ὥραις οὐκ ἐπέσκεπται.

2 Ἡ δὲ λεύκη καὶ ἡ αἴγειρος μονοειδής, ὀρθοφυῆ δὲ ἄμφω, πλὴν μακρότερον πολὺ καὶ μανότερον καὶ λειότερον ἡ αἴγειρος, τὸ δὲ σχῆμα τῶν φύλλων παρόμοιον. ὅμοιον δὲ καὶ τὸ ξύλον τεμνόμενον τῇ λευκότητι. καρπὸν δ' οὐδέτερον τούτων οὐδὲ ἄνθος ἔχειν δοκεῖ.

Ἡ κερκὶς δὲ παρόμοιον τῇ λεύκῃ καὶ τῷ μεγέθει καὶ τῷ τοὺς κλάδους ἐπιλεύκους ἔχειν· τὸ δὲ φύλλον κιττῶδες μὲν ἀγώνιον δὲ ἐκ τοῦ ἄλλου, τὴν δὲ μίαν προμήκη καὶ εἰς ὀξὺ συνήκουσαν· τῷ δὲ χρώματι σχεδὸν ὅμοιον τὸ ὕπτιον καὶ τὸ πρανές· μίσχῳ δὲ προσηρτημένον μακρῷ καὶ λεπτῷ, δι' ὃ καὶ οὐκ ὀρθὸν ἀλλ' ἐγκεκλιμένον. φλοιὸν δὲ τραχύτερον τῆς λεύκης καὶ μᾶλλον ὑπόλεπρον, ὥσπερ ὁ τῆς ἀχράδος. ἄκαρπον δέ.

3 Μονογενὲς δὲ καὶ ἡ κλήθρα· φύσει δὲ καὶ

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[1] γλίσχρον conj. St.; αἰσχρόν Ald.H. *cf.* 5. 3. 4.
[2] *cf.* 5. 5. 2.
[3] *cf.* τὸ θυλακῶδες τοῦτο, 3. 7. 3; 2. 8. 3 n.; 9. 1. 2.

rather than smooth. The tree is large, being both tall and wide-spreading. It is not common about Ida, but rare, and likes wet ground. The wood is yellow strong fibrous and tough[1]; for it is all heart. Men use it for expensive doors[2]: it is easy to cut when it is green, but difficult when it is dry. The tree is thought to bear no fruit, but in the 'wallets'[3] it produces its gum and certain creatures like gnats; and it has in autumn its peculiar 'winter-buds'[4] which are numerous small and black, but these have not been observed at other seasons.

The abele and the black poplar have each but a single kind: both are of erect growth, but the black poplar is much taller and of more open growth, and is smoother, while the shape of its leaves is similar to those of the other. The wood also of both, when cut, is much the same in whiteness. Neither of these trees appears to have fruit or flower.[5]

The aspen is a tree resembling the abele both in size and in having whitish branches, but the leaf is ivy-like: while however it is otherwise without angles, its one angular[6] projection is long and narrows to a sharp point: in colour the upper and under sides are much alike. The leaf is attached to a long thin stalk: wherefore the leaf is not set straight, but has a droop.[7] The bark of the abele is rougher and more scaly, like that of the wild pear, and it bears no fruit.

The alder also has but one form: in growth it is

[1] *κάχρυς*, here probably a gall, mistaken for winter-bud.
[5] *cf.*, however, 3. 3. 4; 4. 10. 2, where T. seems to follow a different authority.
[6] Supply *γωνίαν* from *ἀγώνιον*.
[7] *ἐγκεκλιμένον*: sc. is not in line with the stalk.

ὀρθοφυές, ξύλον δ' ἔχον μαλακὸν καὶ ἐντεριώνην μαλακήν, ὥστε δι' ὅλου κοιλαίνεσθαι τὰς λεπτὰς ῥάβδους. φύλλον δ' ὅμοιον ἀπίῳ, πλὴν μεῖζον καὶ ἰνωδέστερον. τραχύφλοιον δὲ καὶ ὁ φλοιὸς ἔσωθεν ἐρυθρός, δι' ὃ καὶ βάπτει τὰ δέρματα. ῥίζας δὲ ἐπιπολαίους . . . ἡλίκον δάφνης. φύεται δὲ ἐν τοῖς ἐφύδροις ἀλλόθι δ' οὐδαμοῦ.

4 [Σημύδα δὲ τὸ μὲν φύλλον ἔχει ὅμοιον τῇ Περσικῇ καλουμένῃ καρύᾳ πλὴν μικρῷ στενότερον, τὸν φλοιὸν δὲ ποικίλον, ξύλον δὲ ἐλαφρόν· χρήσιμον δὲ εἰς βακτηρίας μόνον εἰς ἄλλο δὲ οὐδέν.

Ἡ δὲ κολυτέα ἔχει τὸ μὲν φύλλον ἐγγὺς τοῦ τῆς ἰτέας, πολύοζον δὲ καὶ πολύφυλλον καὶ τὸ δένδρον ὅλως μέγα· τὸν δὲ καρπὸν ἔλλοβον, καθάπερ τὰ χεδροπά· λοβοῖς γὰρ πλατέσι καὶ οὐ στενοῖς τὸ σπερμάτιον τὸ ἐνὸν μικρὸν καὶ οὐ μέγα· σκληρὸν δὲ μετρίως οὐκ ἄγαν· οὐδὲ πολύκαρπον ὡς κατὰ μέγεθος. σπάνιον δὲ τὸ ἐν λοβοῖς ἔχειν τὸν καρπόν· ὀλίγα γὰρ τοιαῦτα τῶν δένδρων.]

XV. Ἡ δὲ Ἡρακλεωτικὴ καρύα—φύσει γὰρ καὶ τοῦτ' ἄγριον τῷ τε μηδὲν ἢ μὴ πολὺ χείρω γίνεσθαι <ἢ> τῶν ἡμέρων τὸν καρπόν, καὶ τῷ δύνασθαι χειμῶνας ὑποφέρειν καὶ τῷ πολὺ φύεσθαι κατὰ τὰ ὄρη καὶ πολύκαρπον ἐν τοῖς ὀρείοις· ἔτι δὲ τῷ μηδὲ στελεχῶδες ἀλλὰ θαμ-

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[1] Part of the description of the flower, and perhaps of the fruit, seems to be missing. Sch.

[2] *cf.* 4. 8. 1 ; but in 1. 4. 3 the alder is classed with 'amphibious' trees, and in 3. 3. 1 with 'trees of the plain.'

[3] *Betulam*, G from Plin. 16. 74.

also erect, and it has soft wood and a soft heart-wood, so that the slender boughs are hollow throughout. The leaf is like that of the pear, but larger and more fibrous. It has rough bark, which on the inner side is red: wherefore it is used for dyeing hides. It has shallow roots . . .[1] the flower is as large as that of the bay. It grows in wet places[2] and nowhere else.

The *semyda*[3] has a leaf like that of the tree called the 'Persian nut' (walnut), but it is rather narrower: the bark is variegated and the wood light: it is only of use for making walking-sticks and for no other purpose.

The bladder-senna[4] has a leaf near that of the willow, but is many-branched and has much foliage; and the tree altogether is a large one. The fruit is in a pod, as in leguminous plants: the pods in fact are broad rather than narrow, and the seed in them is comparatively small, and is moderately hard, but not so very hard. For its size the tree does not bear much fruit. It is uncommon to have the fruit in a pod; in fact there are few such trees.

Of filbert, terebinth, box, krataigos.

XV. The filbert is also naturally a wild tree, in that its fruit is little, if at all, inferior to that of the tree in cultivation, that it can stand winter, that it grows commonly on the mountains, and that it bears abundance of fruit in mountain regions[5]; also because it does not make a trunk, but is shrubby with

[4] Sch. remarks that the description of κολυτέα is out of place: *cf.* 3. 17. 2. W. thinks the whole section spurious. The antitheses in the latter part suggest a different context, in which κολυτέα was described by comparison with some other tree. [5] ὀρείοις conj. W.; φοραῖς Ald.

νῶδες εἶναι ῥάβδοις ἄνευ μασχαλῶν καὶ ἀνόζοις μακραῖς δὲ καὶ παχείαις ἐνίαις·—οὐ μὴν ἀλλὰ καὶ ἐξημεροῦται. διαφορὰν δὲ ἔχει τῷ τὸν καρπὸν ἀποδιδόναι βελτίω καὶ μεῖζον τὸ φύλλον· κεχαραγμένον δ' ἀμφοῖν· ὁμοιότατον τὸ τῆς κλήθρας, πλὴν πλατύτερον καὶ αὐτὸ τὸ δένδρον μεῖζον. καρπιμώτερον δ' αἰεὶ γίνεται κατα-
2 κοπτόμενον τὰς ῥάβδους. γένη δὲ δύο ἀμφοῖν· αἱ μὲν γὰρ στρογγύλον αἱ δὲ πρόμακρον φέρουσι τὸ κάρυον· ἐκλευκότερον δὲ τὸ τῶν ἡμέρων. καὶ καλλικαρπεῖ μάλιστά γ' ἐν τοῖς ἐφύδροις. ἐξημεροῦται δὲ τὰ ἄγρια μεταφυτευόμενα. φλοιὸν δ' ἔχει λεῖον ἐπιπόλαιον λεπτὸν λιπαρὸν ἰδίως στιγμὰς λευκὰς ἔχοντα ἐν αὐτῷ· τὸ δὲ ξύλον σφόδρα γλίσχρον, ὥστε καὶ τὰ λεπτὰ πάνυ ῥαβδία περιλοπίσαντες κανέα ποιοῦσι, καὶ τὰ παχέα δὲ καταξύσαντες. ἔχει δὲ καὶ ἐντεριώνην λεπτὴν ξανθήν, ᾗ κοιλαίνεται. ἴδιον δ' αὐτῶν τὸ περὶ τὸν ἴουλον, ὥσπερ εἴπομεν.

3 Τῆς δὲ τερμίνθου τὸ μὲν ἄρρεν τὸ δὲ θῆλυ. τὸ μὲν οὖν ἄρρεν ἄκαρπον, δι' ὃ καὶ καλοῦσιν ἄρρεν· τῶν δὲ θηλειῶν ἡ μὲν ἐρυθρὸν εὐθὺς φέρει τὸν καρπὸν ἡλίκον φακὸν ἄπεπτον, ἡ δὲ χλοερὸν ἐνέγκασα μετὰ ταῦτα ἐρυθραίνει, καὶ ἅμα τῇ ἀμπέλῳ πεπαίνουσα τὸ ἔσχατον ποιεῖ μέλανα, μέγεθος ἡλίκον κύαμον, ῥητινώδη δὲ καὶ θυωδέστερον. ἔστι δὲ τὸ δένδρον περὶ μὲν τὴν Ἴδην καὶ Μακεδονίαν βραχὺ θαμνῶδες ἐστραμμένον, περὶ δὲ Δαμασκὸν τῆς Συρίας μέγα καὶ πολὺ καὶ καλόν· ὄρος γάρ τί φασιν εἶναι πάμμεστον

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[1] *cf. C.P.* 2. 12. 6. [2] *cf. Geop.* 10. 68.
[3] λεῖον conj. W.; πλέον UMVAld.

unbranched stems without knots; though some of these are long and stout. Nevertheless it also submits to cultivation. The cultivated form differs in producing better fruit and larger leaves; in both forms the leaf has a jagged edge: the leaf of the alder most closely resembles it, but is broader, and the tree itself is bigger. [1] The filbert is always more fruitful if it has its slender boughs cut off. [2] There are two kinds of each sort; some have a round, others an oblong nut; that of the cultivated tree is paler, and it fruits best in damp places. The wild tree becomes cultivated by being transplanted. Its bark is smooth,[3] consisting of one layer, thin glossy and with peculiar white blotches on it. The wood is extremely tough, so that men make baskets even of the quite thin twigs, having stripped them of their bark, and of the stout ones when they have whittled them. Also it has a small amount of yellow heart-wood, which makes[4] the branches hollow. Peculiar to these trees is the matter of the catkin, as we mentioned.[5]

[6] The terebinth has a 'male' and a 'female' form. The 'male' is barren, which is why it is called 'male'; the fruit of one of the 'female' forms is red from the first and as large as an unripe[7] lentil; the other produces a green fruit which subsequently turns red, and, ripening at the same time as the grapes, becomes eventually black and is as large as a bean, but resinous and somewhat aromatic. About Ida and in Macedonia the tree is low shrubby and twisted, but in the Syrian Damascus, where it abounds, it is tall and handsome; indeed they say

[4] ἢ Ald.H.; ἡ W. with U. *cf.* 3. 13. 4.
[5] 3. 7. 3. [6] Plin. 13. 54.
[7] καὶ before ἄωπτον om. St.

4 τερμίνθων, ἄλλο δ' οὐδὲν πεφυκέναι. ξύλον δὲ ἔχει γλίσχρον καὶ ῥίζας ἰσχυρὰς κατὰ βάθους, καὶ τὸ ὅλον ἀνώλεθρον· ἄνθος δὲ ὅμοιον τῷ τῆς ἐλάας, τῷ χρώματι δὲ ἐρυθρόν. φύλλον, περὶ ἕνα μίσχον πλείω[1] δαφνοειδῆ κατὰ συζυγίαν, ὥσπερ καὶ τὸ τῆς οἴης· καὶ τὸ ἐξ ἄκρου περιττόν· πλὴν ἐγγωνιώτερον τῆς οἴης καὶ δαφνοειδέστερον δὲ κύκλῳ καὶ λιπαρὸν ἅπαν ἅμα τῷ καρπῷ.[2] φέρει δὲ καὶ κωρυκώδη[3] τινὰ κοῖλα, καθάπερ ἡ πτελέα, ἐν οἷς θηρίδια ἐγγίγνεται κωνωποειδῆ· ἐγγίγνεται δέ τι καὶ ῥητινῶδες ἐν τούτοις καὶ γλίσχρον· οὐ μὴν ἐνθεῦτέν γε ἡ ῥητίνη συλλέγεται ἀλλ' ἀπὸ τοῦ ξύλου. ὁ δὲ καρπὸς οὐκ ἀφίησι ῥητίνης πλῆθος, ἀλλὰ προσέχεται μὲν ταῖς χερσί, κἂν μὴ πλυθῇ μετὰ τὴν συλλογὴν συνέχεται· πλυνόμενος δὲ ὁ μὲν λευκὸς καὶ ἄπεπτος ἐπιπλεῖ, ὁ δὲ μέλας ὑφίσταται.

5 Ἡ δὲ πύξος μεγέθει μὲν οὐ μεγάλη, τὸ δὲ φύλλον ὅμοιον ἔχει μυρρίνῳ. φύεται δ' ἐν τοῖς ψυχροῖς τόποις καὶ τραχέσι· καὶ γὰρ τὰ Κύτωρα τοιοῦτον, οὗ ἡ πλείστη γίνεται· ψυχρὸς δὲ καὶ ὁ Ὄλυμπος ὁ Μακεδονικός· καὶ γὰρ ἐνταῦθα γίνεται πλὴν οὐ μεγάλη· μεγίστη δὲ καὶ καλλίστη ἐν Κύρνῳ· καὶ γὰρ εὐμήκεις καὶ πάχος ἔχουσαι πολὺ παρὰ τὰς ἄλλας. δι' ὃ καὶ τὸ μέλι οὐχ ἡδὺ ὄζον τῆς πύξου.

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[1] πλείω: se. φύλλα, in loose apposition to φύλλον. Apparently the leaf is said to resemble that of οἴη in its composite structure, but that of the bay in shape: *cf.* 3. 12. 7.

[2] ἅπαν ἅμα conj. W.; ἅμα ἅπαν ÜAld.

[3] *cf.* 2. 8. 3; 3. 7. 3; 3. 14. 1. κωρυκώδη conj. R. Const.; κορυώδη Ald.; κωρυώδη H.; καρυώδη mBas.

that there is a certain hill which is covered with terebinths, though nothing else grows on it. It has tough wood and strong roots which run deep, and the tree as a whole is impossible to destroy. The flower is like that of the olive, but red in colour. The leaf is made up of a number of leaflets,[1] like bay leaves, attached in pairs to a single leaf-stalk. So far it resembles the leaf of the sorb; there is also the extra leaflet at the tip: but the leaf is more angular than that of the sorb, and the edge resembles more the leaf of the bay; the leaf is glossy all over,[2] as is the fruit. It bears also some hollow bag-like[3] growths, like the elm, in which are found little creatures like gnats; and resinous sticky matter is found also in these bags; but the resin is gathered from the wood and not from these. The fruit does not discharge much resin, but it clings to the hands, and, if it is not washed after gathering, it all sticks together; if it is washed, the part which is white and unripe floats,[4] but the black part sinks.

The box is not a large tree, and it has a leaf like that of the myrtle. It grows in cold rough places; for of this character is Cytora,[5] where it is most abundant. The Macedonian Olympus is also a cold region;[6] for there too it grows, though not to a great size. It is largest and fairest in Corsica,[7] where the tree grows taller and stouter than anywhere else; wherefore the honey there is not sweet, as it smells of the box.

[4] ἐπιπλεῖ conj. R. Const. from G; ἐπὶ πλεῖον Ald.; ἐπὶ πλεῖ (erased) U.

[5] *cf. Cytore buxifer*, Catull. 4. 13; Plin. 16. 70.

[6] *cf.* 5. 7. 7.

[7] Κύρνῳ conj. R. Const. from Plin. *l.c.*; Κυρήνωι U; Κυρήνῃ Ald.

6 Πλήθει δὲ πολὺ κράταιγός ἐστιν, οἱ δὲ κραταιγόνα καλοῦσιν· ἔχει δὲ τὸ μὲν φύλλον ὅμοιον μεσπίλῃ τετανόν,[2] πλὴν μεῖζον ἐκείνου καὶ πλατύτερον ἢ προμηκέστερον, τὸν δὲ χαραγμὸν οὐκ ἔχον ὥσπερ ἐκεῖνο.[3] γίνεται δὲ τὸ δένδρον οὔτε μέγα λίαν οὔτε παχύ· τὸ δὲ ξύλον ποικίλον ἰσχυρὸν ξανθόν·[4] ἔχει δὲ φλοιὸν λεῖον ὅμοιον μεσπίλῃ· μονόρριζον δ' εἰς βάθος ὡς ἐπὶ τὸ πολύ. καρπὸν δ' ἔχει στρογγύλον ἡλίκον ὁ κότινος· πεπαινόμενος δὲ ξανθύνεται καὶ ἐπιμελαίνεται· κατὰ δὲ τὴν γεῦσιν καὶ τὸν χυλὸν μεσπιλῶδες· διόπερ οἷον ἀγρία μεσπίλη δόξειεν ἂν εἶναι. μονοειδὲς δὲ καὶ οὐκ ἔχον διαφοράς.

XVI. Ὁ δὲ πρῖνος φύλλον μὲν ἔχει δρυῶδες, ἔλαττον δὲ καὶ ἐπακανθίζον, τὸν δὲ φλοιὸν λειότερον δρυός. αὐτὸ δὲ τὸ δένδρον μέγα, καθάπερ ἡ δρῦς, ἐὰν ἔχῃ τόπον καὶ ἔδαφος· ξύλον δὲ πυκνὸν καὶ ἰσχυρόν· βαθύρριζον δὲ ἐπιεικῶς καὶ πολύρριζον. καρπὸν δὲ ἔχει βαλανώδη· μικρὰ δὲ ἡ βάλανος· περικαταλαμβάνει δὲ ὁ νέος τὸν ἔνον· ὀψὲ γὰρ πεπαίνει, δι' ὃ καὶ διφορεῖν τινές φασι. φέρει δὲ παρὰ τὴν βάλανον καὶ κόκκον τινὰ φοινικοῦν· ἴσχει δὲ καὶ ἰξίαν καὶ ὑφέαρ· ὥστε ἐνίοτε συμβαίνει τέτταρας ἅμα καρποὺς ἔχειν αὐτόν, δύο μὲν τοὺς ἑαυτοῦ δύο δ' ἄλλους τόν τε τῆς ἰξίας καὶ τὸν τοῦ ὑφέαρος. καὶ τὴν

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[1] Quoted by Athen. 2. 34; *cf.* Plin. 16. 120; 26. 99; 27. 62 and 63.

[2] τετανόν: *cf.* 3. 11. 1; 3. 12. 5. Athen., *l.c.*, has τεταμένον.

[3] ἐκεῖνο Athen. *l.c.*; κἀκεῖνο Ald.

[4] ξανθὸν before ἰσχυρόν Athen. *l.c.*

[1] The *krataigos* is a very common tree; some call it *krataigon*. It has a smooth[2] leaf like that of the medlar, but longer, and its breadth is greater than its length, while the edge is not jagged like that[3] of the medlar. The tree does not grow very tall or thick; its wood is mottled strong and brown[4]; it has a smooth bark like that of the medlar; it has generally a single root, which runs deep. The fruit is round and as large as that of the wild olive[5]; as it ripens it turns brown and black; in taste and flavour it is like that of the medlar; wherefore this might seem to be a sort of wild form of that tree.[6] There is only one form of it and it shews no variation.

Of certain other oaks, arbutus, andrachne, wig-tree.

XVI. The kermes-oak[7] has a leaf like that of the oak, but smaller and spinous,[8] while its bark is smoother than that of the oak. The tree itself is large, like the oak, if it has space and root-room; the wood is close and strong; it roots fairly deep and it has many roots. The fruit is like an acorn, but the kermes-oak's acorn is small; the new one overtakes that of last year, for it ripens late.[9] Wherefore some say that it bears twice. Besides the acorn it bears a kind of scarlet berry[10]; it also has oak-mistletoe[11] and mistletoe; so that sometimes it happens that it has four fruits on it at once, two which are its own and two others, namely those of the oak-mistletoe[11] and

[5] κότινος Athen. *l.c.*; κόψιμος UMVAld.
[6] μεσπίλη added from Athen. *l.c.*
[7] *cf.* 3. 7. 3. [8] *cf.* 3. 16. 2. [9] *cf.* 3. 4. 1, 4 and 6.
[10] Plin. 16. 32; Simon. *ap.* Plut. *Theseus* 17.
[11] *cf. C.P.* 2. 17. 1.

μὲν ἰξίαν φέρει ἐκ τῶν πρὸς βορρᾶν, τὸ δὲ ὑφέαρ ἐκ τῶν πρὸς μεσημβρίαν.

2 Οἱ δὲ περὶ Ἀρκαδίαν δένδρον τι σμίλακα καλοῦσιν, ὅ ἐστιν ὅμοιον τῷ πρίνῳ, τὰ δὲ φύλλα οὐκ ἀκανθώδη ἔχει ἀλλ' ἁπαλώτερα καὶ βαθύτερα καὶ διαφορὰς ἔχοντα πλείους· οὐδὲ τὸ ξύλον ὥσπερ ἐκεῖνο στερεὸν καὶ πυκνόν, ἀλλὰ καὶ μαλακὸν ἐν ταῖς ἐργασίαις.

3 Ὃ δὲ καλοῦσιν οἱ Ἀρκάδες φελλόδρυν τοιάνδε ἔχει τὴν φύσιν· ὡς μὲν ἁπλῶς εἰπεῖν ἀνὰ μέσον πρίνου καὶ δρυός ἐστιν· καὶ ἔνιοί γε ὑπολαμβάνουσιν εἶναι θῆλυν πρῖνον· δι' ὃ καὶ ὅπου μὴ φύεται πρῖνος τούτῳ χρῶνται πρὸς τὰς ἁμάξας καὶ τὰ τοιαῦτα, καθάπερ οἱ περὶ Λακεδαίμονα καὶ Ἠλείαν. καλοῦσι δὲ οἵ γε Δωριεῖς καὶ ἀρίαν τὸ δένδρον· ἔστι δὲ μαλακώτερον μὲν καὶ μανότερον τοῦ πρίνου, σκληρότερον δὲ καὶ πυκνότερον τῆς δρυός· καὶ τὸ χρῶμα φλοϊσθέντος τοῦ ξύλου λευκότερον μὲν τοῦ πρίνου, οἰνωπότερον δὲ τῆς δρυός· τὰ δὲ φύλλα προσέοικε μὲν ἀμφοῖν, ἔχει δὲ μείζω μὲν ἢ ὡς πρῖνος ἐλάττω δὲ ἢ ὡς δρῦς· καὶ τὸν καρπὸν τοῦ μὲν πρίνου κατὰ μέγεθος ἐλάττω ταῖς ἐλαχίσταις δὲ βαλάνοις ἴσον, καὶ γλυκύτερον μὲν τοῦ πρίνου πικρότερον δὲ τῆς δρυός. καλοῦσι δέ τινες τὸν μὲν τοῦ πρίνου καὶ τὸν ταύτης καρπὸν ἄκυλον, τὸν δὲ τῆς δρυὸς βάλανον. μήτραν δὲ ἔχει φανερωτέραν ἢ ὁ πρῖνος· καὶ ἡ μὲν φελλόδρυς τοιαύτην τινὰ ἔχει φύσιν.

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[1] Plin. 16. 19. See Index.
[2] *βαθύτερα* MSS.; *εὐθύτερα* conj. Dalec.
[3] Plin. *l.c.* See Index.

of the mistletoe. It produces the oak-mistletoe on the north side and the mistletoe on the south.

The Arcadians have a tree which they call *smilax*[1] (holm-oak), which resembles the kermes-oak, but has not spinous leaves, its leaves being softer and longer[2] and differing in several other ways. Nor is the wood hard and close like that of the kermes-oak, but quite soft to work.

The tree which the Arcadians call 'cork-oak'[3] (holm-oak) has this character:—to put it generally, it is between the kermes-oak and the oak; and some suppose it to be the 'female' kermes-oak; wherefore, where the kermes-oak does not grow, they use this tree for their carts and such-like purposes; for instance it is so used by the peoples of Lacedaemon and Elis. The Dorians also call the tree *aria*.[4] Its wood is softer and less compact than that of the kermes-oak, but harder and closer than that of the oak. When it is barked,[5] the colour of the wood is paler than that of the kermes-oak, but redder than that of the oak. The leaves resemble those of both trees, but they are somewhat large, if we consider the tree as a kermes-oak, and somewhat small if we regard it as an oak. The fruit is smaller in size than that of the kermes-oak, and equal to the smallest acorns; it is sweeter than that of the kermes-oak, bitterer than that of the oak. Some call the fruit of the kermes-oak and of the *aria* 'mast,'[6] keeping the name 'acorn' for the fruit of the oak. It has a core which is more obvious than in kermes-oak. Such is the character of the 'cork-oak.'

[4] Already described; *cf.* 3. 4. 2; 3. 17. 1.
[5] *cf.* Paus. *Arcadia*, 8. 12.
[6] ἄκυλον: *cf.* Hom. *Od.* 10. 242.

4 Ἡ δὲ κόμαρος, ἡ τὸ μεμαίκυλον φέρουσα τὸ ἐδώδιμον, ἐστὶ μὲν οὐκ ἄγαν μέγα, τὸν δὲ φλοιὸν ἔχει λεπτὸν μὲν παρόμοιον μυρίκῃ, τὸ δὲ φύλλον μεταξὺ πρίνου καὶ δάφνης. ἀνθεῖ δὲ τοῦ Πυανεψιῶνος· τὰ δὲ ἄνθη πέφυκεν ἀπὸ μιᾶς κρεμάστρας ἐπ' ἄκρων βοτρυδόν· τὴν δὲ μορφὴν ἕκαστόν ἐστιν ὅμοιον μύρτῳ προμήκει καὶ τῷ μεγέθει δὲ σχεδὸν τηλικοῦτον· ἄφυλλον δὲ καὶ κοῖλον ὥσπερ ὠὸν ἐκκεκολαμμένον τὸ στόμα δὲ ἀνεῳγμένον· ὅταν δ' ἀπανθήσῃ, καὶ ἡ πρόσφυσις τετρύπηται, τὸ δ' ἀπανθῆσαν λεπτὸν καὶ ὥσπερ σφόνδυλος περὶ ἄτρακτον ἢ κάρνειος Δωρικός· ὁ δὲ καρπὸς ἐνιαυτῷ πεπαίνεται, ὥσθ' ἅμα συμβαίνει τοῦτόν τ' ἔχειν καὶ τὸν ἕτερον ἀνθεῖν.

5 Παρόμοιον δὲ τὸ φύλλον καὶ ἡ ἀνδράχλη ἔχει τῷ κομάρῳ, μέγεθος οὐκ ἄγαν μέγα· τὸν δὲ φλοιὸν λεῖον ἔχει καὶ περιρρηγνύμενον· καρπὸν δ' ἔχει ὅμοιον τῇ κομάρῳ.

6 Ὅμοιον δ' ἐστὶ τούτοις τὸ φύλλον καὶ τὸ τῆς κοκκυγέας· τὸ δὲ δένδρον μικρόν. ἴδιον δὲ ἔχει τὸ ἐκπαπποῦσθαι τὸν καρπόν· τοῦτο γὰρ οὐδ' ἐφ' ἑνὸς ἀκηκόαμεν ἄλλου δένδρου. ταῦτα μὲν οὖν κοινότερα πλείοσι χώραις καὶ τόποις.

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[1] Plin. 15. 98 and 99; Diosc. 1. 122. [2] October.

[3] ἐκκεκολαμμένον MV, *cf.* Arist. *H.A.* 6. 3; ἐγκεκολαμμένον UAld. [4] *cf.* 1. 13. 3.

[5] κάρνειος, an unknown word, probably corrupt; κίονος Δωρικοῦ conj. Sch., 'drum of a Doric column.' *cf.* Athen. 5. 39.

[1]The arbutus, which produces the edible fruit called *memaikylon*, is not a very large tree; its bark is thin and like that of the tamarisk, the leaf is between that of the kermes-oak and that of the bay. It blooms in the month Pyanepsion[2]; the flowers grow in clusters at the end of the boughs from a single attachment; in shape each of them is like an oblong myrtle flower and it is of about the same size; it has no petals, but forms a cup like an empty eggshell,[3] and the mouth is open: when the flower drops off, there is a hole[4] also through the part by which it is attached, and the fallen flower is delicate and like a whorl on a spindle or a Doric *karneios*.[5] The fruit takes a year to ripen, so that it comes to pass that this and the new flower are on the tree together.

[6]The andrachne has a leaf like that of the arbutus and is not a very large tree; the bark is smooth[7] and cracked,[8] the fruit is like that of the arbutus.

The leaf of the wig-tree[9] is also like that of the last named tree, but it is a small tree. Peculiar to it is the fact that the fruit passes into down[10]: we have not heard of such a thing in any other tree. These trees are found in a good many positions and regions.

[6] Plin. 13. 120.

[7] λεῖον conj. Sch.; λευκὸν UAld. In Pletho's excerpt the passage has λεῖον, and Plin., *l.c.*, evidently read λεῖον.

[8] περιρρηγνύμενον. Plin., *l.c.*, seems to have read περιπηγνύμενον. *cf.* 1. 5. 2; 9. 4. 3.

[9] Plin. 13. 121. κοκκυγέας conj. Sch. after Plin. *l.c.*, *cf.* Hesych. *s.v.* κεκκοκυγωμένην: κοκκομηλέας U; κοκκυμηλέας P_2Ald.

[10] ἐκπαπποῦσθαι: *fructum amittere lanugine* Plin. *l.c.* *cf.* 6. 8. 4.

XVII. Ἔνια δὲ ἰδιώτερα, καθάπερ καὶ ὁ φελλός· γίνεται μὲν ἐν Τυρρηνίᾳ, τὸ δὲ δένδρον ἐστὶ στελεχῶδες μὲν καὶ ὀλιγόκλαδον, εὔμηκες δ' ἐπιεικῶς καὶ εὐαυξές· ξύλον ἰσχυρόν· τὸν δὲ φλοιὸν παχὺν σφόδρα καὶ καταρρηγνύμενον, ὥσπερ ὁ τῆς πίτυος, πλὴν κατὰ μείζω. τὸ δὲ φύλλον ὅμοιον ταῖς μελίαις παχὺ προμηκέστερον· οὐκ ἀείφυλλον ἀλλὰ φυλλοβολοῦν. καρπὸν δὲ [αἰεὶ] φέρει βαλανηρὸν ὅμοιον τῇ ἀρίᾳ. περιαιροῦσι δὲ τὸν φλοιὸν καί φασι δεῖν πάντα ἀφαιρεῖν, εἰ δὲ μὴ χεῖρον γίνεται τὸ δένδρον· ἐξαναπληροῦται δὲ πάλιν σχεδὸν ἐν τρισὶν ἔτεσιν.

2 Ἴδιον δὲ καὶ ἡ κολουτέα περὶ Λιπάραν· δένδρον μὲν εὐμέγεθες, τὸν δὲ καρπὸν φέρει ἐν λοβοῖς ἡλίκον φακόν, ὃς πιαίνει τὰ πρόβατα θαυμαστῶς. φύεται δὲ ἀπὸ σπέρματος καὶ ἐκ τῆς τῶν προβάτων κόπρου κάλλιστα. ὥρα δὲ τῆς φυτείας ἅμα Ἀρκτούρῳ δυομένῳ· δεῖ δὲ φυτεύειν προβρέχοντας ὅταν ἤδη διαφύηται ἐν τῷ ὕδατι. φύλλον δ' ἔχει παρόμοιον τήλει. βλαστάνει δὲ τὸ πρῶτον μονοφυὲς ἐπὶ ἔτη μάλιστα τρία ἐν οἷς καὶ τὰς βακτηρίας τέμνουσι· δοκοῦσι γὰρ εἶναι καλαί· καὶ ἐάν τις κολούσῃ ἀποθνήσκει· καὶ γὰρ ἀπαράβλαστόν ἐστιν· εἶτα σχίζεται καὶ ἀποδενδροῦται τῷ τετάρτῳ ἔτει.

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[1] Plin. 16. 34.
[2] Τυρρηνίᾳ conj. R. Const.; πυρρηνίαι UMV; πυρρηνίᾳ Ald.
[3] αἰεὶ must be corrupt: probably repeated from ἀείφυλλον.
[4] βαλανηρὸν conj. Sch.; βαλανήφορον UMVAld.
[5] ἀρίᾳ conj. R. Const. from G; ἀγρίᾳ P_2MVAld.; ἀγρίαι U.

Of cork-oak, kolutea, koloitia, *and of certain other trees peculiar to particular localities.*

XVII. [1] Some however are more local, such as the cork-oak: this occurs in Tyrrhenia[2]; it is a tree with a distinct trunk and few branches, and is fairly tall and of vigorous growth. The wood is strong, the bark very thick and cracked, like that of the Aleppo pine, save that the cracks are larger. The leaf is like that of the manna-ash, thick and somewhat oblong. The tree is not evergreen but deciduous. It has always[3] an acorn-like[4] fruit like that of the *aria*[5] (holm-oak). They strip off the bark,[6] and they say that it should all be removed,[7] otherwise the tree deteriorates: it is renewed again in about three years.

The *kolutea*[8] too is a local tree, occurring in the Lipari islands. It is a tree of good size, and bears its fruit, which is as large as a lentil, in pods; this fattens sheep wonderfully. It grows from seed, and also grows very well from sheep-droppings. The time for sowing it is the setting of Arcturus; and one should first soak the seed and sow it when it is already sprouting in the water. It has a leaf like *'elis*[9] (fenugreek). At first it grows for about three years with a single stem, and in this period men cut their walking-sticks from it; for it seems that it makes excellent ones. And, if the top is cut off during this period, it dies, for it makes no side-shoots. After this period it divides, and in the fourth year develops into a tree.

[6] *cf.* 1. 5. 2; 4. 15. 1; Plin. 17. 234.
[7] ἀφαιρεῖν conj. Coraës; διαιρεῖν P_2Ald.
[8] *cf.* 1. 11. 2; 3. 17. 3.
[9] τήλει conj. R. Const. from G, *faeno graeco*; τίλει UMV; ὕλη Ald.

3 Ἡ δὲ περὶ τὴν Ἴδην, ἣν καλοῦσι κολοιτίαν,[1] ἕτερον εἶδός ἐστιν, θαμνοειδὲς δὲ καὶ ὀζῶδες καὶ πολυμάσχαλον, σπάνιον δέ, οὐ πολύ· ἔχει δὲ φύλλον δαφνοειδὲς πλατυφύλλου δάφνης, πλὴν στρογγυλώτερον καὶ μεῖζον ὥσθ' ὅμοιον φαίνεσθαι τῷ τῆς πτελέας, προμηκέστερον δέ, τὴν χρόαν ἐπὶ θάτερα χλοερὸν ὄπισθεν δὲ ἐπιλευκαῖνον, καὶ πολύϊνον ἐκ τῶν ὄπισθεν ταῖς λεπταῖς ἰσὶ ἔκ τε τῆς ῥάχεως καὶ μεταξὺ τῶν πλευροειδῶν ἀπὸ τῆς μέσης κατατεινουσῶν· φλοιὸν δ' οὐ λεῖον ἀλλ' οἷον τὸν τῆς ἀμπέλου· τὸ δὲ ξύλον σκληρὸν καὶ πυκνόν· ῥίζας δὲ ἐπιπολαίους καὶ λεπτὰς καὶ μανὰς οὐλὰς δ' ἐνίοτε, καὶ ξανθὰς σφόδρα. καρπὸν δὲ οὐκ ἔχειν φασὶν οὐδὲ ἄνθος· τὴν δὲ κορυνώδη κάχρυν καὶ τοὺς ὀφθαλμοὺς τοὺς παρὰ τὰ φύλλα λείους σφόδρα καὶ λιπαροὺς καὶ λευκοὺς τῷ σχήματι δὲ καχρυώδεις· ἀποκοπὲν δὲ καὶ ἐπικαυθὲν παραφύεται καὶ ἀναβλαστάνει.

4 Ἴδια δὲ καὶ τάδε τὰ περὶ τὴν Ἴδην ἐστίν, οἷον ἥ τε Ἀλεξάνδρεια καλουμένη δάφνη καὶ συκῆ τις καὶ ἄμπελος. τῆς μὲν οὖν δάφνης ἐν τούτῳ τὸ ἴδιον, ὅτι ἐπιφυλλόκαρπόν ἐστιν, ὥσπερ καὶ ἡ κεντρομυρρίνη· ἀμφότεραι γὰρ τὸν καρπὸν ἔχουσιν ἐκ τῆς ῥάχεως τοῦ φύλλου.

5 Ἡ δὲ συκῆ θαμνῶδες μὲν καὶ οὐχ ὑψηλόν, πάχος δ' ἔχον ὥστε καὶ πηχυαῖον εἶναι τὴν περίμετρον· τὸ δὲ ξύλον ἐπεστραμμένον γλίσχρον· κάτωθεν μὲν λεῖον καὶ ἄνοζον ἄνωθεν δὲ περί-

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[1] κολοιτίαν (? κολοιτέαν) U. *cf.* 1. 11. 2; 3. 17. 2. Whichever spelling is correct should probably be adopted in all three places. [2] *cf.* 3. 11. 3.

The tree found about Mount Ida, called *kolia*,[1] is a distinct kind and is shrubby and branching from many boughs; but it is rather rare. It has a leaf like that of the 'broad-leaved' bay,[2] but round and larger, so that it looks like that of the elm but it is more oblong: the colour on both sides is green, but the base is whitish; in this part it is very fibrous, because of its fine fibres which spring partly from the midrib,[3] partly between the ribs[4] (so to call them) which run out from the midrib. The bark is not smooth but like that of the vine; the wood is hard and close, the roots are shallow slender and spreading, (though sometimes they are compact), and they are very yellow. They say that this shrub has no fruit nor flower, but has its knobby winter-bud and its 'eyes'; these grow alongside of the leaves, and are very smooth glossy and white, and in shape are like a winter-bud. When the tree is cut or burnt down, it grows from the side and springs up again.

There are also three trees peculiar to Mount Ida, the tree called Alexandrian laurel, a sort of fig, and a 'vine' (currant grape). The peculiarity of the laurel is that it bears fruit on its leaves, like the 'prickly myrtle' (butcher's broom): both have their fruit on the midrib of the leaf.

The 'fig'[5] is shrubby and not tall, but so thick that the stem is a cubit in circumference. The wood is twisted and tough; below it is smooth and unbranched, above it has thick foliage: the colour both

[3] ἔκ τε τῆς ῥαχέως καὶ conj. W.; καὶ ταῖς ῥίζαις καὶ Ald. *cf.* 3. 10. 3, and ἐκ τῆς ῥαχέως below, 3. 17. 4.

[4] πλευροειδῶν : πλευροειδῶς conj. St.

[5] See Index. Plin. 15. 68; *cf.* Athen. 3. 11.

κον· χρῶμα δὲ καὶ φύλλου καὶ φλοιοῦ πελιόν, δὲ σχῆμα τῶν φύλλων ὅμοιον τῷ τῆς φιλύρας αἰ μαλακὸν καὶ πλατὺ καὶ τὸ μέγεθος παραπλήσιον· ἄνθος μεσπιλῶδες καὶ ἀνθεῖ ἅμα τῇ μεσπίλῃ. ὁ δὲ καρπός, ὃν καλοῦσι σῦκον, ἐρυθρὸς ἡλίκος ἐλάας πλὴν στρογγυλώτερος, ἐσθιόμενος δὲ μεσπιλώδης· ῥίζας δὲ ἔχει παχείας ὡσὰν συκῆς ἡμέρου καὶ γλίσχρας. ἀσαπὲς δέ ἐστι τὸ δένδρον καὶ καρδίαν ἔχει στερεὰν οὐκ ἐντεριώνην.

6 Ἡ δὲ ἄμπελος φύεται μὲν τῆς Ἴδης περὶ τὰς Φαλάκρας καλουμένας· ἔστι δὲ θαμνῶδες ῥαβδίοις μικροῖς· τείνονται δὲ οἱ κλῶνες ὡς πυγωνιαῖοι, πρὸς οἷς ῥᾶγές εἰσιν ἐκ πλαγίου μέλαιναι τὸ μέγεθος ἡλίκος κύαμος γλυκεῖαι· ἔχουσι δὲ ἐντὸς γιγαρτῶδές τι μαλακόν· φύλλον στρογγύλον ἀσχιδὲς μικρόν.

XVIII. Ἔχει δὲ καὶ τἆλλα σχεδὸν ὅρη φύσεις τινὰς ἰδίας τὰ μὲν δένδρων τὰ δὲ θάμνων τὰ δ' ἄλλων ὑλημάτων. ἀλλὰ γὰρ περὶ μὲν τῆς ἰδιότητος εἴρηται πλεονάκις ὅτι γίνεται καθ' ἑκάστους τόπους. ἡ δὲ ἐν αὐτοῖς τοῖς ὁμογενέσιν διαφορά, καθάπερ ἡ τῶν δένδρων καὶ τῶν θάμνων, ὁμοίως ἐστὶ καὶ τῶν ἄλλων, ὥσπερ εἴρηται, τῶν πλείστων, ὥσπερ καὶ ῥάμνου καὶ παλιούρου καὶ οἴσου [καὶ οἴτου] καὶ ῥοῦ καὶ κιττοῦ καὶ βάτου καὶ ἑτέρων πολλῶν.

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[1] Lit. grape-stone.
[2] I omit ἡ before διαφορά with Sch.

of leaf and bark is a dull green, the shape of the leaf is like that of the lime; it is soft and broad, and in size it also corresponds; the flower is like that of the medlar, and the tree blooms at the same time as that tree. The fruit, which they call a 'fig,' is red, and as large as an olive, but it is rounder and is like the medlar in taste; the roots are thick like those of the cultivated fig, and tough. The tree does not rot, and it has a solid heart, instead of ordinary heart-wood.

The 'vine' (currant grape) grows about the place called Phalakrai in the district of Ida; it is shrubby with small twigs; the branches are about a cubit long, and attached to them at the side are black berries, which are the size of a bean and sweet; inside they have a sort of soft stone[1]; the leaf is round undivided and small.

Of the differences in various shrubs—buckthorn, withy, Christ's thorn, bramble, sumach, ivy, smilax, [spindle-tree].

XVIII. Most other mountains too have certain peculiar products, whether trees shrubs or other woody plants. However we have several times remarked as to such peculiarities that they occur in all regions. Moreover the variation[2] between things of the same kind which we find in trees obtains also among shrubs and most other things, as has been said: for instance, we find it in buckthorn Christ's thorn withy[3] sumach ivy bramble and many others.

[3] [καὶ οἴτου] bracketed by W.; καὶ ἴσου Ald.; καὶ ἴσου καὶ οἴτου MVP; καὶ οἴσου καὶ οἴτου U. Only οἶσος is mentioned in the following descriptions.

2 Ῥάμνος τε γάρ ἐστιν ἡ μὲν μέλαινα ἡ δὲ λευκή, καὶ ὁ καρπὸς διάφορος, ἀκανθοφόροι δὲ ἄμφω.

Τοῦ τε οἴσου τὸ μὲν λευκὸν τὸ δὲ μέλαν· καὶ τὸ ἄνθος ἑκατέρου καὶ ὁ καρπὸς κατὰ λόγον ὁ μὲν λευκὸς ὁ δὲ μέλας· ἔνιοι δὲ καὶ ὥσπερ ἀνὰ μέσον, ὧν καὶ τὸ ἄνθος ἐπιπορφυρίζει καὶ οὔτε οἰνωπὸν οὔτε ἔκλευκόν ἐστιν ὥσπερ τῶν ἑτέρων. ἔχει δὲ καὶ τὰ φύλλα λεπτότερα καὶ λειότερα καὶ τὰς ῥάβδους τὸ λευκόν.

3 Ὁ τε παλίουρος ἔχει διαφορὰς . . . ἅπαντα δὲ ταῦτα καρποφόρα. καὶ ὅ γε παλίουρος ἐν λοβῷ τινι τὸν καρπὸν ἔχει καθαπερεὶ φύλλῳ, ἐν ᾧ τρία ἢ τέτταρα γίνεται. χρῶνται δ' αὐτῷ πρὸς τὰς βῆχας οἱ ἰατροὶ κόπτοντες· ἔχει γάρ τινα γλισχρότητα καὶ λίπος, ὥσπερ τὸ τοῦ λίνου σπέρμα. φύεται δὲ καὶ ἐπὶ τοῖς ἐφύδροις καὶ ἐν τοῖς ξηροῖς, ὥσπερ ὁ βάτος. [οὐχ ἧττον δέ ἐστι τὸ δένδρον πάρυδρον.] φυλλοβόλον δὲ καὶ οὐχ ὥσπερ ἡ ῥάμνος ἀείφυλλον.

4 Ἔτι δὲ καὶ τοῦ βάτου πλείω γένη, μεγίστην δὲ ἔχοντες διαφορὰν ὅτι ὁ μὲν ὀρθοφυὴς καὶ ὕψος ἔχων, ὁ δ' ἐπὶ τῆς γῆς καὶ εὐθὺς κάτω νεύων καὶ ὅταν συνάπτῃ τῇ γῇ ῥιζούμενος πάλιν, ὃν δὴ καλοῦσί τινες χαμαίβατον. τὸ δὲ κυνόσβατον τὸν καρπὸν ὑπέρυθρον ἔχει καὶ παραπλήσιον τῷ τῆς ῥόας· ἔστι δὲ θάμνου καὶ δένδρου μεταξὺ καὶ παρόμοιον ταῖς ῥόαις, τὸ δὲ φύλλον ἀκανθῶδες.

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[1] *cf.* 1. 9. 4; 3. 18. 12; *C.P.* 1. 10. 7.

[2] Some words are missing, which described various forms of παλίουρος, alluded to in πάντα ταῦτα (Sch.). *cf.* 4. 3. 3, where an African παλίουρος is described.

[3] καθαπερεὶ φύλλῳ conj. W., *cf.* 3. 11. 2; καθάπερ τὸ φύλλον UMV.

[1]Thus of buckthorn there is the black and the white form, and there is difference in the fruit, though both bear thorns.

Of the withy there is a black and a white form; the flower and fruit of each respectively correspond in colour to the name; but some specimens are, as it were, intermediate, the flower being purplish, and neither wine-coloured nor whitish as in the others. The leaves in the white kind are also slenderer and smoother, as also are the branches.

There is variation also in the Christ's thorn . . .[2] all these forms are fruit-bearing. Christ's thorn has its fruit in a sort of pod, resembling a leaf,[3] which contains three or four seeds. Doctors bruise[4] them and use them against coughs; for they have a certain viscous and oily character, like linseed. The shrub grows in wet and dry places alike, like the bramble.[5] But it is deciduous, and not evergreen like buckthorn.

Of the bramble again there are several kinds, shewing very great variation; one is erect and tall, another runs along the ground and from the first bends downwards, and, when it touches the earth, it roots again; this some call the 'ground bramble.' The 'dog's bramble' (wild rose) has a reddish fruit, like that of the pomegranate[6]; and, like the pomegranate, it is intermediate between a shrub and a tree; but the leaf is spinous.[7]

[4] *κόπτουσι*: for the tense *cf.* 3. 17. 2, *προβρέχοντας*.

[5] *οὐχ . . . πάρυδρον* probably a gloss, W.

[6] *ῥόαις* UMV (?) Ald.; *ῥοδαῖς* conj. Sch. from Plin. 16. 180. Athen. (2. 82) cites the passage with *παραπ. τῇ ῥοιᾷ*. The Schol. on Theocr. 5. 92 seems to have traces of *both* readings.

[7] *ἀκανθῶδες* conj. Sch. from Schol. on Theocr. (see last note), which quotes the passage with *ἀκανθῶδες*; *ἀγνῶδες* UAld.; so also Athen. *l.c.* Plin. (24. 121) seems to have read *ἰχνῶδες* (*vestigio hominis simile*).

5 Τῆς δὲ ῥοῦ τὸ μὲν ἄρρεν τὸ δὲ θῆλυ καλοῦσι τῷ τὸ μὲν ἄκαρπον εἶναι τὸ δὲ κάρπιμον. οὐκ ἔχει δὲ οὐδὲ τὰς ῥάβδους ὑψηλὰς οὐδὲ παχείας, φύλλον δ' ὅμοιον πτελέᾳ πλὴν μικρὸν προμηκέστερον καὶ ἐπίδασυ. τῶν δὲ κλωνίων τῶν νέων ἐξ ἴσου τὰ φύλλα εἰς δύο, κατ' ἄλληλα δὲ ἐκ τῶν πλαγίων ὥστε στοιχεῖν.[2] βάπτουσι δὲ τούτῳ καὶ οἱ σκυτοδέψαι τὰ δέρματα τὰ λευκά. ἄνθος λευκὸν βοτρυῶδες,[3] τῷ σχήματι δὲ τὸ ὁλοσχερὲς ὄστλιγγας ἔχον ὥσπερ καὶ ὁ βότρυς· ἀπανθήσαντος δὲ ὁ καρπὸς ἅμα τῇ σταφύλῃ ἐρυθραίνεται, καὶ γίνονται οἷον φακοὶ λεπτοὶ συγκείμενοι· βοτρυῶδες δὲ τὸ σχῆμα καὶ τούτων. ἔχει δὲ τὸ φαρμακῶδες τοῦτο ὃ καλεῖται ῥοῦς[4] ἐν αὐτῷ ὀστῶδες, ὃ καὶ τῆς ῥοῦ διηττημένης ἔχει πολλάκις· ῥίζα δ' ἐπιπόλαιος καὶ μονοφυὴς ὥστε ἀνακάμπτεσθαι ῥᾳδίως ὁλόρριζα· τὸ δὲ ξύλον ἐντεριώνην ἔχει, εὔφθαρτον δὲ καὶ κοπτόμενον. ἐν πᾶσι δὲ γίγνεται τοῖς τόποις, εὐθενεῖ δὲ μάλιστα ἐν τοῖς ἀργιλώδεσι.

6 Πολυειδὴς δὲ ὁ κιττός· καὶ γὰρ ἐπίγειος, ὁ δὲ εἰς ὕψος αἰρόμενος· καὶ τῶν ἐν ὕψει πλείω γένη. τρία δ' οὖν φαίνεται τὰ μέγιστα ὅ τε λευκὸς καὶ ὁ μέλας καὶ τρίτον ἡ ἕλιξ. εἴδη δὲ καὶ ἑκάστου τούτων πλείω. λευκὸς γὰρ ὁ μὲν τῷ καρπῷ μόνον, ὁ δὲ καὶ τοῖς φύλλοις ἐστί. πάλιν δὲ τῶν λευκοκάρπων μόνον ὁ μὲν ἁδρὸν καὶ πυκνὸν καὶ συνεστηκότα τὸν καρπὸν ἔχει καθαπερεὶ σφαῖραν,

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[1] Plin. 13. 55; 24. 91.
[2] στοιχεῖν: *cf.* 3. 5. 3; Plin. 13. 55.
[3] βοτρυῶδες conj. W.; βοτρυηδόν U; βοτρυδόν Ald.
[4] ὁ ῥοῦς masc. *cf.* Diosc. 1. 108.

[1] Of the sumach they recognise a 'male' and a 'female' form, the former being barren, the latter fruit-bearing. The branches are not lofty nor stout, the leaf is like that of the elm, but small more oblong and hairy. On the young shoots the leaves grow in pairs at equal distances apart, corresponding to each other on the two sides, so that they are in regular rows.[2] Tanners use this tree for dyeing white leather. The flower is white and grows in clusters; the general form of it, with branchlets, is like that of the grape-bunch; when the flowering is over, the fruit reddens like the grape, and the appearance of it is like small lentils set close together; the form of these too is clustering.[3] The fruit contains the drug called by the same name,[4] which is a bony substance; it is often still found even when the fruit has been put through a sieve. The root is shallow and single, so that these trees are easily bent right over,[5] root and all. The wood has heart-wood, and it readily perishes and gets worm-eaten.[6] The tree occurs in all regions, but flourishes most in clayey soils.

[7] The ivy also has many forms; one kind grows on the ground, another grows tall, and of the tall-growing ivies there are several kinds. However the three most important seem to be the white the black and the *helix*. And of each of these there are several forms. Of the 'white' one is white only in its fruit, another in its leaves also. Again to take only white-fruited sorts, one of these has its fruit well formed close and compact like a ball; and this

[5] *i.e.* nearly uprooted by wind.
[6] *κοπτόμενον*: *cf.* 8. 11. 2, 3 and 5.
[7] Plin. 16. 144–147.

ὃν δὴ καλοῦσί τινες κορυμβίαν, οἱ δ' Ἀθήνῃσιν Ἀχαρνικόν. ὁ δὲ ἐλάττων διακεχυμένος ὥσπερ καὶ ὁ μέλας· ἔχει δὲ καὶ ὁ μέλας διαφορὰς ἀλλ' οὐχ ὁμοίως φανεράς.

7 Ἡ δὲ ἕλιξ ἐν μεγίσταις διαφοραῖς· καὶ γὰρ τοῖς φύλλοις πλεῖστον διαφέρει τῇ τε μικρότητι καὶ τῷ γωνοειδῆ καὶ εὐρυθμότερα εἶναι· τὰ δὲ τοῦ κιττοῦ περιφερέστερα καὶ ἁπλᾶ· καὶ τῷ μήκει τῶν κλημάτων καὶ ἔτι τῷ ἄκαρπος εἶναι. διατείνονται γάρ τινες τῷ μὴ ἀποκιττοῦσθαι τῇ φύσει τὴν ἕλικα ἀλλὰ τὴν ἐκ τοῦ κιττοῦ τελειουμένην. (εἰ δὲ πᾶσα ἀποκιττοῦται, καθάπερ τινές φασιν, ἡλικίας ἂν εἴη καὶ διαθέσεως οὐκ εἴδους διαφορά, καθάπερ καὶ τῆς ἀπίου πρὸς τὴν ἀχράδα.) πλὴν τό γε φύλλον καὶ ταύτης πολὺ διαφέρει πρὸς τὸν κιττόν. σπάνιον δὲ τοῦτο καὶ ἐν ὀλίγοις ἐστὶν ὥστε παλαιούμενον μεταβάλλειν,
8 ὥσπερ ἐπὶ τῆς λεύκης καὶ τοῦ κρότωνος. εἴδη δ' ἐστὶ πλείω τῆς ἕλικος, ὡς μὲν τὰ προφανέστατα καὶ μέγιστα λαβεῖν τρία, ἥ τε χλοερὰ καὶ ποιώδης ἥπερ καὶ πλείστη, καὶ ἑτέρα ἡ λευκή, καὶ τρίτη ἡ ποικίλη, ἣν δὴ καλοῦσί τινες Θρᾳκίαν.

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[1] *cf.* Theocr. 11. 46. [2] Plin. 16. 145 foll.
[3] *i.e.* is the most 'distinct' of the ivies.
[4] *cf.* 1. 10. 1; Diosc. 2. 179.
[5] *i.e.* as an explanation of the barrenness of *helix*.
[6] *i.e.* and so becomes fertile.
[7] διατείνονται: *cf. C.P.* 4. 6. 1. διατ. τῷ . . . apparently = "insist on the view that," . . . but the dative is strange. The sentence, which is highly elliptical, is freely emended by most editors.

kind some call *korymbias*, but the Athenians call it the 'Acharnian' ivy. Another kind is smaller and loose in growth like the black ivy.[1] There are also variations in the black kind, but they are not so well marked.

[2] The *helix* presents the greatest differences[3]; the principal difference is in the leaves,[4] which are small angular and of more graceful proportions, while those of the ivy proper are rounder and simple; there is also difference in the length of the twigs, and further in the fact that this tree is barren. For,[5] as to the view that the *helix* by natural development turns into the ivy,[6] some insist[7] that this is not so, the only true ivy according to these being that which was ivy from the first[8]; (whereas if, as some say, the *helix* invariably[9] turns into ivy, the difference would be merely one of age and condition, and not of kind, like the difference between the cultivated and the wild pear). However the leaf even of the full-grown *helix* is very different from that of the ivy, and it happens but rarely and in a few specimens that in this plant a change in the leaf occurs as it grows older, as it does in the abele and the castor-oil plant.[10] [11] There are several forms of the *helix*, of which the three most conspicuous and important are the green 'herbaceous' kind (which is the commonest), the white, and the variegated, which some call the 'Thracian' *helix*. Each of these appears to

[8] *i.e.* and *helix* being a distinct plant which is always barren.

[9] πᾶσα conj. Sch.; πᾶς Ald.

[10] Sc. as well as in *ivy*; *cf.* 1. 10. 1, where this change is said to be characteristic of these three trees. (The rendering attempted of this obscure section is mainly from W.'s note.)

[11] Plin. 16. 148 foll.

ἑκάστη δὲ τούτων δοκεῖ διαφέρειν· καὶ γὰρ τῆς χλοώδους ἡ μὲν λεπτοτέρα καὶ ταξιφυλλοτέρα καὶ ἔτι πυκνοφυλλοτέρα, ἡ δ' ἧττον πάντα ταῦτ' ἔχουσα. καὶ τῆς ποικίλης ἡ μὲν μεῖζον ἡ δ' ἔλαττον τὸ φύλλον, καὶ τὴν ποικιλίαν διαφέρουσα. ὡσαύτως δὲ καὶ τὰ τῆς λευκῆς τῷ μεγέθει καὶ τῇ χροιᾷ διαφέρουσιν. εὐαυξεστάτη δὲ ἡ ποιώδης καὶ ἐπὶ πλεῖστον προϊοῦσα. φανερὰν δ' εἶναί φασιν τὴν ἀποκιττουμένην οὐ μόνον τοῖς φύλλοις ὅτι μείζω καὶ πλατύτερα ἔχει ἀλλὰ καὶ τοῖς βλαστοῖς· εὐθὺς γὰρ ὀρθοὺς ἔχει, καὶ οὐχ ὥσπερ ἡ ἑτέρα κατακεκαμμένη, καὶ διὰ τὴν λεπτότητα καὶ διὰ τὸ μῆκος· τῆς δὲ κιττώδους καὶ βραχύτεροι καὶ παχύτεροι. καὶ ὁ κιττὸς ὅταν ἄρχηται σπερμοῦσθαι μετέωρον ἔχει καὶ ὀρθὸν τὸν βλαστόν.

9 Πολύρριζος μὲν οὖν ἅπας κιττὸς καὶ πυκνόρριζος συνεστραμμένος ταῖς ῥίζαις καὶ ξυλώδεσι καὶ παχείαις καὶ οὐκ ἄγαν βαθύρριζος, μάλιστα δ' ὁ μέλας, καὶ τοῦ λευκοῦ ὁ τραχύτατος καὶ ἀγριώτατος· δι' ὃ καὶ χαλεπὸς παραφύεσθαι πᾶσι τοῖς δένδροις· ἀπόλλυσι γὰρ πάντα καὶ ἀφαυαίνει παραιρούμενος τὴν τροφήν. λαμβάνει δὲ μάλιστα πάχος οὗτος καὶ ἀποδενδροῦται καὶ γίνεται αὐτὸ καθ' αὑτὸ κιττοῦ δένδρον. ὡς δ' ἐπὶ τὸ πλεῖον εἶναι πρὸς ἑτέρῳ φιλεῖ καὶ ζητεῖ καὶ ὥσπερ
10 ἐπαλλόκαυλόν ἐστιν. ἔχει δ' εὐθὺς καὶ τῆς

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[1] ταξιφυλλοτέρα conj. W. from Plin. 16. 149, *folia in ordinem digesta*; μακροφυλλοτέρα MSS. cf. 1. 10. 8.

[2] κατακεκαμμένη conj. W.; κατακεκαυμένη UAld.; κατακεκαμμένους conj. Sch.

[3] κιττώδους MSS.; ποώδους conj. St. [4] cf. *C.P.* 1. 16. 4.

present variations; of the green one form is slenderer and has more regular[1] and also closer leaves, the other has all these characteristics in a less degree. Of the variegated kind again one sort has a larger, one a smaller leaf, and the variegation is variable. In like manner the various forms of the white *helix* differ in size and colour. The 'herbaceous' kind is the most vigorous and covers most space. They say that the form which is supposed to turn into ivy is clearly marked not only by its leaves, because they are larger and broader, but also by its shoots; for these are straight from the first, and this form does not bend over[2] like the other; also because the shoots are slenderer and larger, while those of the ivy-like[3] form are shorter and stouter. [4]The ivy too, when it begins to seed, has its shoots upward-growing and erect.

All ivies have numerous close roots, which are tangled together woody and stout, and do not run very deep; but this is specially true of the black kind and of the roughest and wildest forms of the white. Wherefore it is mischievous to plant this against any tree; for it destroys and starves any tree by withdrawing the moisture. This form also more than the others grows stout and becomes tree-like, and in fact becomes itself an independent ivy tree, though in general it likes and seeks to be[5] against another tree, and is, as it were, parasitic.[6] [7]Moreover from the first it has also this natural

[5] εἶναι conj. W.; αἰεὶ UM; ἀεὶ Ald.

[6] *i.e.* depends on another tree; not, of course, in the strict botanical sense. *cf.* 3. 18. 11. ἐπαλλόκαυλον conj. Scal.; ἐπαυλόκαλον MVAld.U (with υ corrected). *cf.* περιαλλόκαυλος, 7. 8. 1; *C.P.* 2. 18. 2.

[7] Plin. 16. 152.

φύσεώς τι τοιοῦτον· ἐκ γὰρ τῶν βλαστῶν ἀφίησιν ἀεὶ ῥίζας ἀνὰ μέσον τῶν φύλλων, αἴσπερ ἐνδύεται τοῖς δένδροις καὶ τοῖς τειχίοις οἷον ἐξεπίτηδες πεποιημέναις ὑπὸ τῆς φύσεως· δι' ὃ καὶ ἐξαιρούμενος τὴν ὑγρότητα καὶ ἕλκων ἀφαυαίνει, καὶ ἐὰν ἀποκοπῇ κάτωθεν δύναται διαμένειν καὶ ζῆν. ἔχει δὲ καὶ ἑτέραν διαφορὰν κατὰ τὸν καρπὸν οὐ μικράν· ὁ μὲν γὰρ ἐπίγλυκύς ἐστιν ὁ δὲ σφόδρα πικρὸς καὶ τοῦ λευκοῦ καὶ τοῦ μέλανος· σημεῖον δ' ὅτι τὸν μὲν ἐσθίουσιν οἱ ὄρνιθες τὸν δ' οὔ. τὰ μὲν οὖν περὶ τὸν κιττὸν οὕτως ἔχει.

11 Ἡ δὲ σμῖλάξ[1] ἐστι μὲν ἐπαλλόκαυλον[2], ὁ δὲ καυλὸς[3] ἀκανθώδης καὶ ὥσπερ ὀρθάκανθος, τὸ δὲ φύλλον κιττῶδες μικρὸν ἀγώνιον, κατὰ τὴν μίσχου πρόσφυσιν τυληρόν[4]. ἴδιον δ' ὅτι τήν τε διὰ μέσου ταύτην[5] ὥσπερ ῥάχιν λεπτὴν ἔχει καὶ τὰς στημονίους διαλήψεις οὐκ ἀπὸ ταύτης, ὥσπερ τὰ τῶν ἄλλων, ἀλλὰ περὶ αὐτὴν περιφερεῖς ἠγμένας ἀπὸ τῆς προσφύσεως τοῦ μίσχου τῷ φύλλῳ. παρὰ δὲ τοῦ καυλοῦ τὰ γόνατα καὶ παρὰ τὰς διαλείψεις τὰς φυλλικὰς ἐκ τῶν αὐτῶν μίσχων τοῖς φύλλοις παραπέφυκεν ἴουλος λεπτὸς καὶ ἑλικτός· ἄνθος δὲ λευκὸν καὶ εὐῶδες λείριον·

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[1] σμῖλαξ: ? μῖλαξ W. *cf.* 1. 10. 5; Plin. 16. 153–155.
[2] ἐπαλλόκαυλον conj. Sch.; ἐπαυλόκαυλον V. *cf.* 3. 18. 10.
[3] καυλὸς conj. R. Const.; καρπὸς UMVAld.
[4] τυληρόν conj. W.; νοτηρόν Ald.U (corrected).
[5] ταύτην: *cf.* τὸ θυλακῶδες τοῦτο, 3. 7. 3. Is the pronoun

characteristic, that it regularly puts forth roots from the shoots between the leaves, by means of which it gets a hold of trees and walls, as if these roots were made by nature on purpose. Wherefore also by withdrawing and drinking up the moisture it starves its host, while, if it is cut off below, it is able to survive and live. There are also other not inconsiderable differences in the fruit; both in the white and in the black kind it is in some cases rather sweet, in others extremely bitter; in proof whereof birds eat one but not the other. Such are the facts about ivy.

The smilax[1] is parasitic,[2] but its stem[3] is thorny and has, as it were, straight thorns; the leaf is ivy-like small and without angles, and makes a callus[4] at the junction with the stalk. A peculiarity of it is its conspicuous[5] slender midrib, so to call it, which divides it in two; also the fact that the thread-like branchings[6] do not start from this, as in other leaves, but are carried in circles round it, starting from the junction of the leaflet with the leaf. And at the joints of the stem[7] and the spaces between the leaves there grows from the same stalk as the leaves a fine spiral tendril.[8] The flower is white and fragrant like a lily.[9] The fruit

deictic, referring to an actual specimen shewn in lecture? *cf.* also 4. 7. 1.

[6] διαλήψεις Ald.; διαλείψεις UMV. A mistake probably due to διαλείψεις below, where it is right. διάληψις is the Aristotelian word for a 'division.'

[7] τοῦ καυλοῦ τὰ γόνατα conj. Sch.; τὸν καυλὸν τὸν ἄτονον Ald.

[8] This must be the meaning of ἴουλος here, qualified by ἑλικτός; but elsewhere it = catkin. *cf.* 3. 5. 5.

[9] λείριον conj. R. Const. from Plin. *l.c. olente lilium*; ἠρινόν UAld.

τὸν δὲ καρπὸν ἔχει προσεμφερῆ τῷ στρύχνῳ καὶ τῷ μηλώθρῳ καὶ μάλιστα τῇ καλουμένῃ σταφυλῇ
12 ἀγρίᾳ· κατακρέμαστοι δ' οἱ βότρυες κιττοῦ τρόπον· παρεγγίζει δ' ὁ παραθριγκισμὸς πρὸς τὴν σταφυλήν· ἀπὸ γὰρ ἑνὸς σημείου οἱ μίσχοι οἱ ῥαγικοί. ὁ δὲ καρπὸς ἐρυθρός, ἔχων πυρῆνας τὸ μὲν ἐπὶ πᾶν δύο, ἐν τοῖς μείζοσι τρεῖς ἐν δὲ τοῖς μικροῖς ἕνα· σκληρὸς δ' ὁ πυρὴν εὖ μάλα καὶ τῷ χρώματι μέλας ἔξωθεν. ἴδιον δὲ τὸ τῶν βοτρύων, ὅτι ἐκ πλαγίων τε τὸν καυλὸν παραθριγκίζουσιν, καὶ κατ' ἄκρον ὁ μέγιστος βότρυς τοῦ καυλοῦ, ὥσπερ ἐπὶ τῆς ῥάμνου καὶ τοῦ βάτου. τοῦτο δὲ δῆλον ὡς καὶ ἀκρόκαρπον καὶ πλαγιόκαρπον.

13 [Τὸ δ' εὐώνυμος καλούμενον δένδρον φύεται μὲν ἄλλοθί τε καὶ τῆς Λέσβου ἐν τῷ ὄρει τῷ Ὀρδύννῳ καλουμένῳ· ἔστι δὲ ἡλίκον ῥόα καὶ τὸ φύλλον ἔχει ῥοῶδες, μεῖζον δὲ ἢ χαμαιδάφνης, καὶ μαλακὸν δὲ ὥσπερ ἡ ῥόα. ἡ δὲ βλάστησις ἄρχεται μὲν αὐτῷ περὶ τὸν Ποσειδεῶνα· ἀνθεῖ δὲ τοῦ ἦρος· τὸ δὲ ἄνθος ὅμοιον τὴν χρόαν τῷ λευκῷ ἴῳ· ὄζει δὲ δεινὸν ὥσπερ φόνου. ὁ δὲ καρπὸς ἐμφερὴς τὴν μορφὴν μετὰ τοῦ κελύφους τῷ τοῦ σησάμου λοβῷ· ἔνδοθεν δὲ στερεὸν πλὴν διῃρημένον κατὰ τὴν τετραστοιχίαν. τοῦτο ἐσθιό-

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[1] Presumably *s.* ὁ ἐδώδιμος. See Index.

[2] παρεγγίζει δ' ὁ παραθριγκισμὸς I conj., *cf.* παραθριγκίζουσι below; παρωγγύζει δὲ παραθρινακίζει δὲ ὡς U; παραγγίζει δὲ παραθρηνακίζει δὲ ὡς MV; παραθριγκίζει δὲ ὡς conj. W.

is like the *strykhnos*[1] and the *melothron* (bryony), and most of all like the berry which is called the 'wild grape' (bryony). The clusters hang down as in the ivy, but the regular setting[2] of the berries resembles the grape-cluster more closely; for the stalks which bear the berries start from a single point. The fruit is red, having generally two stones, the larger ones three and the smaller one; the stone is very hard and in colour black outside. A peculiarity of the clusters is that they make a row[3] along the sides of the stalk, and the longest cluster is at the end of the stalk, as in the buckthorn and the bramble. It is clear that the fruit is produced both at the end and at the sides.

[4]The tree called the spindle-tree[5] grows, among other places, in Lesbos, on the mountain called Ordynnos.[6] It is as large as the pomegranate and has a leaf like that of that tree, but larger than that of the periwinkle,[7] and soft, like the pomegranate leaf. It begins to shoot about the month Poseideon,[8] and flowers in the spring; the flower in colour is like the gilliflower, but it has a horrible smell, like shed blood.[9] The fruit, with its case, is like the pod of sesame[10]; inside it is hard, but it splits easily according to its four divisions. This tree, if eaten

[3] *παραθριγκίζουσιν* conj. Sch.; *παραθρυγκίζουσαν* U (corrected); *παραθρυγγίζουσι* M.

[4] This section down to the word *ἀνόχῳ* is clearly out of place: *εὐώνυμος* was not one of the plants proposed for discussion 3. 18. 1. It should come somewhere among the descriptions of trees characteristic of special localities.

[5] Plin. 13. 118. [6] *cf.* Plin. 5. 140.

[7] This irrelevant comparison probably indicates confusion in the text, as is shewn also by Pletho's excerpt of part of this section: see Sch.

[8] January. [9] *φόνον: cf.* 6. 4. 6. [10] *cf.* 8. 5. 2.

μενον ὑπὸ τῶν προβάτων ἀποκτιννύει, καὶ τὸ φύλλον καὶ ὁ καρπός, καὶ μάλιστα τὰς αἶγας ἐὰν μὴ καθάρσεως τύχῃ. καθαίρεται δὲ ἀνόχῳ.] περὶ μὲν οὖν δένδρων καὶ θάμνων εἴρηται· ἐν δὲ τοῖς ἑξῆς περὶ τῶν λειπομένων λεκτέον.

by sheep, is fatal[1] to them, both the leaf and the fruit, and it is especially fatal to goats unless they are purged by it; and the purging is effected by diarrhoea.[2] So we have spoken of trees and shrubs; in what follows we must speak of the plants which remain.

[1] In Pletho's excerpt (see above) this is said of periwinkle.
[2] *i.e.* and not by vomiting.

BOOK IV

Δ

1. Αἱ μὲν οὖν διαφοραὶ τῶν ὁμογενῶν τεθεώρηνται πρότερον. ἅπαντα δ' ἐν τοῖς οἰκείοις τόποις καλλίω γίνεται καὶ μᾶλλον εὐσθενεῖ· καὶ γὰρ τοῖς ἀγρίοις εἰσὶν ἑκάστοις οἰκεῖοι, καθάπερ τοῖς ἡμέροις· τὰ μὲν γὰρ φιλεῖ τοὺς ἐφύδρους καὶ ἑλώδεις, οἷον αἴγειρος λεύκη ἰτέα καὶ ὅλως τὰ παρὰ τοὺς ποταμοὺς φυόμενα, τὰ δὲ τοὺς εὐσκεπεῖς καὶ εὐηλίους, τὰ δὲ μᾶλλον τοὺς παλισκίους. πεύκη μὲν γὰρ ἐν τοῖς προσείλοις καλλίστη καὶ μεγίστη, ἐν δὲ τοῖς παλισκίοις ὅλως οὐ φύεται· ἐλάτη δὲ ἀνάπαλιν ἐν τοῖς παλισκίοις καλλίστη τοῖς δ' εὐείλοις οὐχ ὁμοίως.

2 Ἐν Ἀρκαδίᾳ γοῦν περὶ τὴν Κράνην καλουμένην τόπος ἐστί τις κοῖλος καὶ ἄπνους, εἰς ὃν οὐδέποθ' ὅλως ἥλιον ἐμβάλλειν φασίν· ἐν τούτῳ δὲ πολὺ διαφέρουσιν αἱ ἐλάται καὶ τῷ μήκει καὶ τῷ πάχει, οὐ μὴν ὁμοίως γε πυκναὶ οὐδ' ὡραῖαι ἀλλ' ἥκιστα, καθάπερ καὶ αἱ πεῦκαι αἱ ἐν τοῖς παλισκίοις· δι' ὃ καὶ πρὸς τὰ πολυτελῆ τῶν ἔργων, οἷον θυρώματα καὶ εἴ τι ἄλλο σπουδαῖον, οὐ χρῶνται τούτοις ἀλλὰ πρὸς τὰς ναυπηγίας μᾶλλον καὶ τὰς οἰκοδομάς· καὶ γὰρ δοκοὶ κάλλι-

BOOK IV

Of the Trees and Plants special to particular Districts and Positions.

Of the importance of position and climate.

I. The differences between trees of the same kind have already been considered. Now all grow fairer and are more vigorous in their proper positions; for wild, no less than cultivated trees, have each their own positions: some love wet and marshy ground, as black poplar abele willow, and in general those that grow by rivers; some love exposed[1] and sunny positions; some prefer a shady place. The fir is fairest and tallest in a sunny position, and does not grow at all in a shady one; the silver-fir on the contrary is fairest in a shady place, and not so vigorous in a sunny one.

Thus there is in Arcadia near the place called Krane a low-lying district sheltered from wind, into which they say that the sun never strikes; and in this district the silver-firs excel greatly in height and stoutness, though they have not such close grain nor such comely wood, but quite the reverse,—like the fir when it grows in a shady place. Wherefore men do not use these for expensive work, such as doors or other choice articles, but rather for ship-building and house-building. For excellent

[1] εὐσκεπεῖς should mean 'sheltered,' but cannot in this context, nor in *C.P.* 1. 13. 11 and 12: the word seems to have been confused with εὔσκοπος.

σται καὶ τανεῖαι καὶ κέραιαι αἱ ἐκ τούτων, ἔτι δ' ἱστοὶ τῷ μήκει διαφέροντες ἀλλ' οὐχ ὁμοίως ἰσχυροί· καὶ ἐκ τῶν προσείλων ἅμα τῇ βραχύτητι πυκνότεροί τε ἐκείνων καὶ ἰσχυρότεροι γίνονται.

3 Χαίρει δὲ σφόδρα καὶ ἡ μίλος τοῖς παλισκίοις καὶ ἡ πάδος καὶ ἡ θραύπαλος. περὶ δὲ τὰς κορυφὰς τῶν ὀρέων καὶ τοὺς ψυχροὺς τόπους θυία μὲν φύεται καὶ εἰς ὕψος, ἐλάτη δὲ καὶ ἄρκευθος φύεται μὲν οὐκ εἰς ὕψος δέ, καθάπερ καὶ περὶ τὴν ἄκραν Κυλλήνην· φύεται δὲ καὶ ἡ κήλαστρος ἐπὶ τῶν ἄκρων καὶ χειμεριωτάτων. ταῦτα μὲν οὖν ἄν τις θείη φιλόψυχρα· τὰ δ' ἄλλα πάντα ὡς εἰπεῖν [οὐ] μᾶλλον χαίρει τοῖς προσείλοις. οὐ μὴν ἀλλὰ καὶ τοῦτο συμβαίνει κατὰ τὴν χώραν τὴν οἰκείαν ἑκάστῳ τῶν δένδρων. ἐν Κρήτῃ γοῦν φασιν ἐν τοῖς Ἰδαίοις ὄρεσι καὶ ἐν τοῖς Λευκοῖς καλουμένοις ἐπὶ τῶν ἄκρων ὅθεν οὐδέποτ' ἐπιλείπει χιὼν κυπάριττον εἶναι· πλείστη γὰρ αὕτη τῆς ὕλης καὶ ὅλως ἐν τῇ νήσῳ καὶ ἐν τοῖς ὄρεσιν.

4 Ἔστι δέ, ὥσπερ καὶ πρότερον εἴρηται, καὶ τῶν ἀγρίων καὶ τῶν ἡμέρων τὰ μὲν ὀρεινὰ τὰ δὲ πεδεινὰ μᾶλλον. ἀναλογίᾳ δὲ καὶ ἐν αὐτοῖς τοῖς ὄρεσι τὰ μὲν ἐν τοῖς ὑποκάτω τὰ δὲ περὶ τὰς κορυφάς, ὥστε καὶ καλλίω γίνεται καὶ εὐσθενῆ. πανταχοῦ δὲ καὶ πάσης τῆς ὕλης πρὸς βορρᾶν τὰ ξύλα πυκνότερα καὶ οὐλότερα καὶ ἁπλῶς καλλίω· καὶ ὅλως δὲ πλείω ἐν τοῖς προσβορείοις φύεται. αὐξάνεται δὲ καὶ ἐπιδίδωσι τὰ πυκνὰ

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[1] I omit *αἱ* before *κέραιαι* with P.

[2] ἅμα I conj. ; ἀλλὰ Ald.; om. W. after Sch.; ἀλλ' ἅμα conj. St.

rafters beams and yard-arms[1] are made from these, and also masts of great length which are not however equally strong; while masts made of trees grown in a sunny place are necessarily[2] short but of closer grain and stronger than the others.

Yew *pados* and joint-fir rejoice exceedingly in shade. On mountain tops and in cold positions odorous cedar grows even to a height, while silver-fir and Phoenician cedar grow, but not to a height,—for instance on the top of Mount Cyllene; and holly also grows in high and very wintry positions. These trees then we may reckon as cold-loving; all others, one may say in general, prefer a sunny position. However this too depends partly on the soil appropriate to each tree; thus they say that in Crete on the mountains of Ida and on those called the White Mountains the cypress is found on the peaks whence the snow never disappears; for this is the principal tree both in the island generally and in the mountains.

Again, as has been said[3] already, both of wild and of cultivated trees some belong more to the mountains, some to the plains. And on the mountains themselves in proportion to the height some grow fairer[4] and more vigorous in the lower regions, some about the peaks. However it is true of all trees anywhere that with a north aspect the wood is closer and more compact[5] and better generally; and, generally speaking, more trees grow in positions facing the north. Again trees which are close

[3] 3. 2 4.

[4] Something seems to have dropped out before ὥστε.

[5] οὐλότερα conj. W. from mutilated word in U; καλλιώτερα MV; καλλίω Ald.

μὲν ὄντα μᾶλλον εἰς μῆκος, δι' ὃ καὶ ἄνοζα καὶ εὐθέα καὶ ὀρθοφυῆ γίνεται, καὶ κωπεῶνες ἐκ τούτων κάλλιστοι· <τὰ δὲ μανὰ> μᾶλλον εἰς βάθος καὶ πάχος, δι' ὃ καὶ σκολιώτερα καὶ ὀζωδέστερα καὶ τὸ ὅλον στερεώτερα καὶ πυκνότερα φύεται.

6 Σχεδὸν δὲ τὰς αὐτὰς ἔχει διαφορὰς τούτοις καὶ ἐν τοῖς παλισκίοις καὶ ἐν τοῖς εὐείλοις καὶ ἐν τοῖς ἀπνόοις καὶ εὐπνόοις· ὀζωδέστερα γὰρ καὶ βραχύτερα καὶ ἧττον εὐθέα τὰ ἐν τοῖς εὐείλοις ἢ τοῖς προσηνέμοις. ὅτι δὲ ἕκαστον ζητεῖ καὶ χώραν οἰκείαν καὶ κρᾶσιν ἀέρος φανερὸν τῷ τὰ μὲν φέρειν ἐνίους τόπους τὰ δὲ μὴ φέρειν μήτε αὐτὰ γιγνόμενα μήτε φυτευόμενα ῥᾳδίως, ἐὰν δὲ καὶ ἀντιλάβηται μὴ καρποφορεῖν, ὥσπερ ἐπὶ τοῦ φοίνικος ἐλέχθη καὶ τῆς Αἰγυπτίας συκαμίνου καὶ ἄλλων· εἰσὶ γὰρ πλείω καὶ ἐν πλείοσι χώραις τὰ μὲν ὅλως οὐ φυόμενα τὰ δὲ φυόμενα μὲν ἀναυξῆ δὲ καὶ ἄκαρπα καὶ τὸ ὅλον φαῦλα. περὶ ὧν ἴσως λεκτέον ἐφ' ὅσον ἔχομεν ἱστορίας.

II. Ἐν Αἰγύπτῳ γάρ ἐστιν ἴδια δένδρα πλείω, ἥ τε συκάμινος καὶ ἡ περσέα καλουμένη καὶ ἡ βάλανος καὶ ἡ ἄκανθα καὶ ἕτερ' ἄττα.

Ἔστι δὲ ἡ μὲν συκάμινος παραπλησία πως τῇ ἐνταῦθα συκαμίνῳ· καὶ γὰρ τὸ φύλλον παρόμοιον

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[1] κωπεῶνες : *cf.* 5. 1. 7. [2] τὰ δὲ μανὰ add. W.
[3] *cf.* 5. 1. 8. [4] 2. 2. 10.
[5] ὅλως . . . μὲν conj. W.; ὅλως οὐ φυτευόμενα U; ὅλως φυτευόμενα MVPAld.

together grow and increase more in height, and so become unbranched straight and erect, and the best oar-spars[1] are made from these, while those that grow far apart[2] are of greater bulk and denser habit[3]; wherefore they grow less straight and with more branches, and in general have harder wood and a closer grain.

Such trees exhibit nearly the same differences, whether the position be shady or sunny, windless or windy; for trees growing in a sunny or windy position are more branched shorter and less straight. Further that each tree seeks an appropriate position and climate is plain from the fact that some districts bear some trees but not others; (the latter do not grow there of their own accord, nor can they easily be made to grow), and that, even if they obtain a hold, they do not bear fruit—as was said[4] of the date-palm the sycamore and others; for there are many trees which in many places either do not grow at all, or,[5] if they do, do not thrive nor bear fruit, but are in general of inferior quality. And perhaps we should discuss this matter, so far as our enquiries go.

Of the trees special to Egypt, and of the carob.

II. [6] Thus in Egypt there are a number of trees which are peculiar[7] to that country, the sycamore the tree called *persea* the *balanos* the acacia and some others.

Now the sycamore to a certain extent resembles the tree which bears that name[8] in our country; its

[6] Plin. 13. 56 and 57.
[7] ἴδια conj. R. Const.; ἔνια Ald.
[8] *i.e.* mulberry. See Index.

ἔχει καὶ τὸ μέγεθος καὶ τὴν ὅλην πρόσοψιν, τὸν δὲ καρπὸν ἰδίως φέρει παρὰ τὰ ἄλλα, καθάπερ ἐλέχθη καὶ ἐν τοῖς ἐξ ἀρχῆς· οὐ γὰρ ἀπὸ τῶν βλαστῶν οὐδ' ἀπὸ τῶν ἀκρεμόνων ἀλλ' ἐκ τοῦ στελέχους, μέγεθος μὲν ἡλίκον σῦκον καὶ τῇ ὄψει δὲ παραπλήσιον, τῷ χυλῷ δὲ καὶ τῇ γλυκύτητι τοῖς ὀλύνθοις, πλὴν γλυκύτερον πολὺ καὶ κεγχραμίδας ὅλως οὐκ ἔχοντα, πλήθει δὲ πολύν. καὶ πέττειν οὐ δύναται μὴ ἐπικνισθέντα· ἀλλ' ἔχοντες ὄνυχας σιδηροῦς ἐπικνίζουσιν· ἃ δ' ἂν ἐπικνισθῇ τεταρταῖα πέττεται· τούτων δ' ἀφαιρεθέντων πάλιν ἄλλα φύεται καὶ ἄλλα καὶ ἐκ τοῦ αὐτοῦ τόπου μηδὲν παραλλάττοντα· καὶ τοῦθ' οἱ μὲν τρὶς οἱ δὲ πλεονάκις φασὶ γίνεσθαι.

2 πολύοπον δὲ τὸ δένδρον σφόδρα ἐστὶ καὶ τὸ ξύλον αὐτοῦ εἰς πολλὰ χρήσιμον. ἴδιον δὲ ἔχειν δοκεῖ παρὰ τἆλλα· τμηθὲν γὰρ εὐθὺς χλωρόν ἐστι· αὐαίνεται δὲ ἐμβύθιον· εἰς βόθρον δὲ ἐμβάλλουσι καὶ εἰς τὰς λίμνας εὐθὺς καὶ ταριχεύουσι· βρεχόμενον δ' ἐν τῷ βυθῷ ξηραίνεται· καὶ ὅταν τελέως ξηρὸν γένηται, τότε ἀναφέρεται καὶ ἐπινεῖ καὶ δοκεῖ τότε καλῶς τεταριχεῦσθαι· γίνεται γὰρ κοῦφον καὶ μανόν. ἡ μὲν οὖν συκάμινος ἔχει ταύτας τὰς ἰδιότητας.

3 Ἔοικε δέ τις παραπλησία ἡ φύσις εἶναι καὶ τῆς ἐν Κρήτῃ καλουμένης Κυπρίας συκῆς· καὶ γὰρ ἐκείνη φέρει τὸν καρπὸν ἐκ τοῦ στελέχους καὶ ἐκ τῶν παχυτάτων ἀκρεμόνων, πλὴν ὅτι βλαστόν τινα ἀφίησι μικρὸν ἄφυλλον ὥσπερ ῥιζίον, πρὸς ᾧ γε ὁ καρπός. τὸ δὲ στέλεχος μέγα

[1] 1. 1. 7; *cf.* 1. 14. 2.

[2] *cf. C.P.* 1. 17. 9; Diosc. 1. 127; Athen. 2. 36. This

leaf is similar, its size, and its general appearance; but it bears its fruit in a quite peculiar manner, as was said at the very outset[1]; it is borne not on the shoots or branches, but on the stem; in size it is as large as a fig, which it resembles also in appearance, but in flavour and sweetness it is like the 'immature figs,' except that it is much sweeter and contains absolutely no seeds, and it is produced in large numbers. It cannot ripen unless it is scraped; but they scrape it with iron 'claws'[2]; the fruits thus scraped ripen in four days. If these are removed, others and others again grow from exactly the same point, and this some say occurs three times over, others say it can happen more times than that. Again the tree is very full of sap, and its wood is useful for many purposes. There is another peculiar property which it appears to possess; when it is cut, it is at first green, but it dries in deep water[3]; they put it at once in a hole or in pools and so season it; and it becomes dry by being soaked in the deep water, and when it is completely dry, it is fetched up and floats and is then thought to be duly seasoned; for it is now light and porous. Such are the peculiarities of the sycamore.

Somewhat similar appears to be the character of the tree which in Crete is called the 'Cyprian fig'[4] (sycamore). For this also bears its fruit on the stem and on the thickest branches; but in this case there is a small leafless shoot, like a root, to which the fruit is attached. The stem is large and like the

scraping was the prophet Amos' occupation: *cf.* Amos 7. 14. comm.

[3] *ἐμβύθιον* conj. W.; *εἰς βύθον* UMVPAld. ? *ἐν βύθῳ ὄν.*

[4] See Index. *cf.* Athen. 3. 11; Plin. 13. 58; Diosc. 1. 127. 3.

καὶ παρόμοιον τῇ λεύκῃ, φύλλον δὲ τῇ πτελέᾳ. πεπαίνει δὲ τέτταρας καρπούς, ὅσαιπερ αὐτοῦ καὶ αἱ βλαστήσεις· οὐδένα δὲ πεπαίνει μὴ ἐπιτμηθέντος τοῦ ἐρινοῦ καὶ ἐκρυέντος τοῦ ὀποῦ. ἡ δὲ γλυκύτης προσεμφερὴς τῷ σύκῳ καὶ τὰ ἔσωθεν τοῖς ἐρινοῖς· μέγεθος ἡλίκον κοκκύμηλον.

4 (Ταύτῃ δὲ παραπλησία καὶ ἣν οἱ Ἴωνες κερωνίαν καλοῦσιν· ἐκ τοῦ στελέχους γὰρ καὶ αὕτη φέρει τὸν πλεῖστον καρπόν, ἀπὸ δὲ τῶν ἀκρεμόνων, ὥσπερ εἴπομεν, ὀλίγον. ὁ δὲ καρπὸς ἕλλοβος, ὃν καλοῦσί τινες Αἰγύπτιον σῦκον διημαρτηκότες· οὐ γίνεται γὰρ ὅλως περὶ Αἴγυπτον ἀλλ' ἐν Συρίᾳ καὶ ἐν Ἰωνίᾳ δὲ καὶ περὶ Κνίδον καὶ Ῥόδον. ἀείφυλλον δὲ καὶ ἄνθος ἔκλευκον ἔχον καί τι βαρύτητος, μὴ μετεωρίζον δὲ σφόδρα καὶ ὅλως ἐκ τῶν κάτω παραβλαστητικὸν ἄνωθεν δὲ ὑποξηραινόμενον. ἔχει δὲ ἅμα καὶ τὸν ἔνον καὶ τὸν νέον καρπόν· ἀφαιρουμένου γὰρ θατέρου μετὰ Κύνα καὶ ὁ ἕτερος εὐθὺς φανερὸς κυούμενος· κύεται γὰρ ὥσπερ βότρυς ὁμοσχήμων· εἶτ' αὐξηθεὶς ἀνθεῖ περὶ Ἀρκτοῦρον καὶ ἰσημερίαν· ἀπὸ τούτου δὴ διαμένει τὸν χειμῶνα μέχρι Κυνός. ἡ μὲν οὖν ὁμοιότης ὅτι στελεχόκαρπα καὶ ταῦτα· διαφοραὶ δὲ αἱ εἰρημέναι πρὸς τὴν συκάμινον.)

5 Ἐν Αἰγύπτῳ δ' ἐστὶν ἕτερον ἡ περσέα καλούμενον, τῇ μὲν προσόψει μέγα καὶ καλόν, παραπλήσιον δὲ μάλιστα τῇ ἀπίῳ καὶ φύλλοις καὶ ἄνθεσι καὶ ἀκρεμόσι καὶ τῷ ὅλῳ σχήματι· πλὴν

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[1] ὅσαιπερ conj. R. Const., etc., *cf.* Athen. *l.c.*; ὅσα ὑπὲρ αὐτοῦ U (corrected); ὅσα ὑπὲρ αὐτὸν M; ὅσα ὑπὲρ αὐτοῦ Ald.
[2] Plin. 13. 59. [3] 1. 14. 2.

abele, but the leaf is like that of the elm. It ripens its fruit four times a year, having also [1] four periods of growth; but it ripens no fruit unless the 'fig' is split and the juice let out. The sweet taste resembles that of the fig, and the inside of the fruit is like that of wild figs: it is as large as a plum.

[2] (Like this too is the tree which the Ionians call carob; for this too bears most of its fruit on the stem, though it bears a little also on the branches, as we said.[3] The fruit is in a pod; some call it the 'Egyptian fig'—erroneously; for it does not occur at all in Egypt, but in Syria and Ionia and also in Cnidos and Rhodes. It is evergreen and has a whitish flower and is somewhat acrid; it does not attain to a great height, and it sends out side-shoots entirely from its lower parts, while it withers above. It has on it at the same time both last year's fruit and the new fruit; for if the one is removed after the rising of the dog-star, immediately the other is seen swelling up; for there swells [4] up as it were another similar cluster. This then increases and flowers about the rising of Arcturus and the equinox; and thenceforward it [5] persists through the winter to the rising of the dog-star. The likeness then consists in the fact that these trees too bear fruit on their stems, and the differences between them and the sycamore are as has been said.)

[6] In Egypt there is another tree called the *persea*, which in appearance is large and fair, and it most resembles the pear in leaves flowers branches and general form, but it is evergreen, while the other is

[4] κύεται conj. W. from G; κύει MSS.
[5] *i.e.* the cluster, now in the fruit stage.
[6] Plin. 13. 60 and 61.

τὸ μὲν ἀείφυλλον τὸ δὲ φυλλοβόλον. καρπὸν δὲ φέρει πολὺν καὶ πᾶσαν ὥραν· περικαταλαμβάνει γὰρ ὁ νέος ἀεὶ τὸν ἔνον· πέττει δὲ ὑπὸ τοὺς ἐτησίας· τὸν δ' ἄλλον ὠμότερον ἀφαιροῦσι καὶ ἀποτιθέασιν. ἔστι δὲ τὸ μέγεθος ἡλίκον ἄπιος, τῷ σχήματι δὲ πρόμακρος ἀμυγδαλώδης, χρῶμα δὲ αὐτοῦ ποιῶδες. ἔχει δὲ ἐντὸς κάρυον, ὥσπερ τὸ κοκκύμηλον, πλὴν ἔλαττον πολὺ καὶ μαλακώτερον· τὴν δὲ σάρκα γλυκεῖαν σφόδρα καὶ ἡδεῖαν καὶ εὔπεπτον· οὐδὲν γὰρ ἐνοχλεῖ πολὺ προσενεγκαμένων. εὔριζον δὲ τὸ δένδρον καὶ μήκει καὶ πάχει καὶ πλήθει πολύ· ἔχει δὲ καὶ ξύλον ἰσχυρὸν καὶ καλὸν τῇ ὄψει μέλαν, ὥσπερ ὁ λωτός, ἐξ οὗ καὶ τὰ ἀγάλματα καὶ τὰ κλινία καὶ τραπέζια καὶ τἆλλα τὰ τοιαῦτα ποιοῦσιν.

6 Ἡ δὲ βάλανος ἔχει μὲν τὴν προσηγορίαν ἀπὸ τοῦ καρποῦ· φύλλον δ' αὐτῇ παραπλήσιον τῷ τῆς μυρρίνης πλὴν προμηκέστερον. ἔστι δὲ τὸ δένδρον εὐπαχὲς μὲν καὶ εὐμέγεθες, οὐκ εὐφυὲς δὲ ἀλλὰ παρεστραμμένον. τοῦ καρποῦ δὲ τοῖς κελύφεσι χρῶνται οἱ μυρεψοὶ κόπτοντες· εὐῶδες γὰρ ἔχει τὸν δὲ καρπὸν αὐτὸν ἀχρεῖον. ἔστι δὲ καὶ τῷ μεγέθει καὶ τῇ ὄψει παραπλήσιος τῷ τῆς καππάριος· ξύλον δὲ ἰσχυρὸν καὶ εἰς ἄλλα τε χρήσιμον καὶ εἰς τὰς ναυπηγίας.

7 Τὸ δὲ καλούμενον κουκιόφορόν ἐστιν ὅμοιον τῷ φοίνικι· τὴν δὲ ὁμοιότητα κατὰ τὸ στέλεχος ἔχει καὶ τὰ φύλλα· διαφέρει δὲ ὅτι ὁ μὲν φοῖνιξ μονοφυὲς καὶ ἁπλοῦν ἐστι, τοῦτο δὲ προσαυξηθὲν σχίζεται καὶ γίνεται δίκρουν, εἶτα πάλιν ἑκάτερον

[1] ἀποτιθέασιν conj. R. Const. from G (*recondunt*); τιθέασι UMVAld.

deciduous. It bears abundant fruit and at every season, for the new fruit always overtakes that of last year. It ripens its fruit at the season of the etesian winds: the other fruit they gather somewhat unripe and store[1] it. In size it is as large as a pear, but in shape it is oblong, almond-shaped, and its colour is grass-green. It has inside a stone like the plum, but much smaller and softer; the flesh is sweet and luscious and easily digested; for it does no hurt if one eats it in quantity. The tree has good roots as to length thickness and number. Moreover its wood is strong and fair in appearance, black like the nettle-tree: out of it men make their images beds tables and other such things.

[2] The *balanos* gets its name from its fruit[3]; its leaf is like that of the myrtle[4] but it is longer. The tree is of a good stoutness[5] and stature, but not of a good shape, being crooked. The perfumers use the husks of the fruit, which they bruise; for this is fragrant, though the fruit itself is useless. In size and appearance it is like the fruit of the caper; the wood is strong and useful for shipbuilding and other purposes.

[6] The tree called the doum-palm is like the date-palm; the resemblance is in the stem and the leaves, but it differs in that the date-palm is a tree with a single undivided stem, while the other, as it increases, splits and becomes forked,[7] and then each of the two

[2] Plin. 13. 61.
[3] *i.e.* it is like an acorn (*Βάλανος*).
[4] *μυρρίνης* MVPAld.; *μυρίκης* U.
[5] *εὐτραχὲς* conj. Sch.; *εὐπαθὲς* U; *ἀπαθὲς* Ald.H.
[6] Plin. 13. 62.
[7] *cf.* 2. 6. 9, where the same tree is evidently indicated. *δίκρουν* conj. Salm., Scal., etc.; *ἄκρον* UAld.H.

τούτων ὁμοίως· ἔτι δὲ τὰς ῥάβδους βραχείας ἔχει σφόδρα καὶ οὐ πολλάς. χρῶνται δὲ τῷ φύλλῳ, καθάπερ τῷ φοίνικι, πρὸς τὰ πλέγματα. καρπὸν δὲ ἴδιον ἔχει πολὺ διαφέροντα καὶ μεγέθει καὶ σχήματι καὶ χυλῷ· μέγεθος μὲν γὰρ ἔχει σχεδὸν χειροπληθές· στρογγύλον δὲ καὶ οὐ προμήκη· χρῶμα ἐπίξανθον· χυλὸν δὲ γλυκὺν καὶ εὔστομον· οὐκ ἀθρόον δέ, ὥσπερ ὁ φοῖνιξ, ἀλλὰ κεχωρισμένον καθ' ἕνα· πυρῆνα δὲ μέγαν καὶ σφόδρα σκληρόν, ἐξ οὗ τοὺς κρίκους τορνεύουσι τοὺς εἰς τοὺς στρωματεῖς τοὺς διαποικίλους· διαφέρει δὲ πολὺ τὸ ξύλον τοῦ φοίνικος· τὸ μὲν γὰρ μανὸν καὶ ἰνῶδες καὶ χαῦνον, τὸ δὲ πυκνὸν καὶ βαρὺ καὶ σαρκῶδες καὶ διατμηθὲν οὖλον σφόδρα καὶ σκληρόν ἐστιν. καὶ οἵ γε δὴ Πέρσαι πάνυ ἐτίμων αὐτὸ καὶ ἐκ τούτου τῶν κλινῶν ἐποιοῦντο τοὺς πόδας.

8 Ἡ δὲ ἄκανθα καλεῖται μὲν διὰ τὸ ἀκανθῶδες ὅλον τὸ δένδρον εἶναι πλὴν τοῦ στελέχους· καὶ γὰρ ἐπὶ τῶν ἀκρεμόνων καὶ ἐπὶ τῶν βλαστῶν καὶ ἐπὶ τῶν φύλλων ἔχει. μεγέθει δὲ μέγα, καὶ γὰρ δωδεκάπηχυς ἐξ αὐτῆς ἐρέψιμος ὕλη τέμνεται. διττὸν δὲ τὸ γένος αὐτῆς, ἡ μὲν γάρ ἐστι λευκὴ ἡ δὲ μέλαινα· καὶ ἡ μὲν λευκὴ ἀσθενής τε καὶ εὔσηπτος· ἡ δὲ μέλαινα ἰσχυροτέρα τε καὶ ἄσηπτος, δι' ὃ καὶ ἐν ταῖς ναυπηγίαις χρῶνται πρὸς τὰ ἐγκοίλια αὐτῇ. τὸ δένδρον δὲ οὐκ ἄγαν ὀρθοφυές. ὁ δὲ καρπὸς ἔλλοβος, καθάπερ τῶν χεδροπῶν, ᾧ χρῶνται οἱ ἐγχώριοι πρὸς τὰ δέρματα ἀντὶ κηκίδος. τὸ δ' ἄνθος καὶ τῇ ὄψει καλόν, ὥστε καὶ στεφάνους ποιεῖν ἐξ αὐτοῦ, καὶ φαρμα-

branches forks again: moreover the twigs are very short and not numerous. They use the leaf, like the palm-leaf, for plaiting. It has a peculiar fruit, very different from that of the date-palm in size form and taste; for in size it is nearly big enough to fill the hand, but it is round rather than long; the colour is yellowish, the flavour sweet and palatable. It does not grow bunched together, like the fruit of the date-palm, but each fruit grows separately; it has a large and very hard stone, out of which they turn the rings for embroidered bed-hangings.[1] The wood is very different to that of the date-palm; whereas the latter is of loose texture fibrous and porous,[2] that of the doum-palm is close heavy and fleshy, and when split is exceedingly compact and hard. The Persians[3] used to esteem it highly and made the feet of their couches out of it.

[4] The *akantha* (acacia) is so called because the whole tree is spinous (*akanthodes*) except the stem; for it has spines on the branches shoots and leaves. It is of large stature, since lengths of timber for roofing of twelve cubits are cut from it. There are two kinds, the white and the black; the white is weak and easily decays, the black is stronger and less liable to decay; wherefore they use it in shipbuilding for the ribs.[5] The tree is not very erect in growth. The fruit is in a pod, like that of leguminous plants, and the natives use it for tanning hides instead of gall. [6] The flower is very beautiful in appearance, so that they make garlands of it, and it has medicinal

[1] Plin. *l.c.*, *velares annulos*; *cf.* Athen. 12. 71, *ad fin.*
[2] χαῦνον conj. Sch.; χλωρὸν Ald.
[3] *i.e.* during their occupation of Egypt.
[4] Plin. 13. 63; Athen. 15. 25.
[5] *cf.* Hdt. 2. 96. [6] *cf.* Athen. *l.c.*

κῶδες, δι' ὃ καὶ συλλέγουσιν οἱ ἰατροί. γίνεται δὲ ἐκ ταύτης καὶ τὸ κόμμι· καὶ ῥέει καὶ πληγείσης καὶ αὐτόματον ἄνευ σχάσεως. ὅταν δὲ κοπῇ, μετὰ τρίτον ἔτος εὐθὺς ἀναβεβλάστηκε· πολὺ δὲ τὸ δένδρον ἐστί, καὶ δρυμὸς μέγας περὶ τὸν Θηβαϊκὸν νόμον, οὗπερ καὶ ἡ δρῦς καὶ ἡ περσέα πλείστη καὶ ἡ ἐλάα.

9 Καὶ γὰρ ἡ ἐλάα περὶ τοῦτον τὸν τόπον ἐστί, τῷ ποταμῷ μὲν οὐκ ἀρδευομένη, πλείω γὰρ ἢ τριακόσια στάδια ἀπέχει, ναματιαίοις δ' ὕδασιν· εἰσὶ γὰρ κρῆναι πολλαί. τὸ δ' ἔλαιον οὐδὲν χεῖρον τοῦ ἐνθάδε, πλὴν κακωδέστερον διὰ τὸ σπανίοις τοῖς ἁλσὶ χρῆσθαι· φύσει δὲ τὸ ξύλον τοῦ δένδρου καὶ σκληρὸν καὶ παραπλήσιον τεμνόμενον τὴν χρόαν τῷ λωτίνῳ.

10 Ἄλλο δέ τι δένδρον ἡ κοκκυμηλέα, μέγα μὲν τῷ μεγέθει καὶ τὴν φύσιν τοῦ καρποῦ ὅμοιον τοῖς μεσπίλοις, καὶ τὸ μέγεθος παραπλήσιον πλὴν ἔχοντα πυρῆνα στρογγύλον· ἄρχεται δὲ ἀνθεῖν μηνὸς Πυανεψιῶνος, τὸν δὲ καρπὸν πεπαίνει περὶ ἡλίου τροπὰς χειμερινάς· ἀείφυλλον δ' ἐστίν. οἱ δὲ περὶ τὴν Θηβαΐδα κατοικοῦντες διὰ τὴν ἀφθονίαν τοῦ δένδρου ξηραίνουσι τὸν καρπὸν καὶ τὸν πυρῆνα ἐξαιροῦντες κόπτουσι καὶ ποιοῦσι παλάθας.

11 Ὕλημα δὲ ἴδιόν τι φύεται περὶ Μέμφιν, οὐ κατὰ φύλλα καὶ βλαστοὺς καὶ τὴν ὅλην μορφὴν

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[1] *cf.* Hdt. *l.c.*
[2] σχάσεως conj. R. Const.; σχίσεως Ald.
[3] πλείστη conj. R. Const.; πλεκτὴ UMVAld.
[4] *cf. C.P.* 6. 8. 7, where this olive is said to produce *no* oil.
[5] *cf.* Strabo, 17. 1. 35.

properties, wherefore physicians gather it. [1] Gum is also produced from it, which flows both when the tree is wounded and also of its own accord without any incision [2] being made. When the tree is cut down, after the third year it immediately shoots up again; it is a common tree, and there is a great wood of it in the Thebaid, where grow the oak, the *persea* in great abundance,[3] and the olive.

[4] For the olive also grows in that district, though it is not watered by the river, being more than 300 furlongs distant from it, but by brooks; for there are many springs. The oil produced is not inferior to that of our country, except that it has a less pleasing smell,[5] because it has not a sufficient natural supply of salt.[6] The wood of the tree is hard in character, and, when split, is like in colour [7] to that of the nettle-tree.

[8] There is another tree, the (Egyptian) plum (sebesten), which is of great stature, and the character of its fruit [9] is like the medlar (which it resembles in size), except that it has a round stone. It begins to flower in the month Pyanepsion,[10] and ripens its fruit about the winter solstice, and it is evergreen.[11] The inhabitants of the Thebaid, because of the abundance of the tree, dry the fruit; they take out the stones, bruise it, and make cakes of it.

There is a peculiar bush [12] which grows about Memphis, whose peculiarity does not lie in its leaves

[6] *σπανίοις . . . φύσει* conj. W.; *σπανίως τοῖς ἁλσὶ χρ. τῇ φύσει* Ald.; so U, but omitting *τῇ*.
[7] *i.e.* black. *cf.* 4. 3. 1. [8] Plin. 13. 64 and 65.
[9] *τοῦ καρποῦ* add. Scal. from G and Plin. *l.c.* [10] October.
[11] *ἀείφυλλον* conj. Scal. from G and Plin. *l.c.*; *φύλλον* UMV Ald.
[12] *Mimosa asperata*; see Index, App. (2). *ὕλημα* conj. Scal. from G (*materia*); *οἴδημα* M Ald. U (corrected).

ἔχον τὸ ἴδιον ἀλλ' εἰς τὸ συμβαῖνον περὶ αὐτὸ πάθος· ἡ μὲν γὰρ πρόσοψις ἀκανθώδης ἐστὶν αὐτοῦ, καὶ τὸ φύλλον παρόμοιον ταῖς πτερίσιν· ὅταν δέ τις ἅψηται τῶν κλωνίων, ὥσπερ ἀφαυαινόμενα τὰ φύλλα συμπίπτειν φασὶν εἶτα μετά τινα χρόνον ἀναβιώσκεσθαι πάλιν καὶ θάλλειν. καὶ τὰ μὲν ἴδια τῆς χώρας, ὅσα γ' ἂν δένδρα τις ἢ θάμνους εἴποι, τά γ' ἐπιφανέστατα ταῦτ' ἐστί. περὶ γὰρ τῶν ἐν τῷ ποταμῷ καὶ τοῖς ἕλεσιν ὕστερον ἐροῦμεν, ὅταν καὶ περὶ τῶν ἄλλων ἐνύδρων.

12 [Ἅπαντα δὲ ἐν τῇ χώρᾳ τὰ δένδρα τὰ τοιαῦτα μεγάλα καὶ τοῖς μήκεσι καὶ τοῖς πάχεσιν· ἐν γοῦν Μέμφιδι τηλικοῦτο δένδρον εἶναι λέγεται τὸ πάχος, ὃ τρεῖς ἄνδρες οὐ δύνανται περιλαμβάνειν. ἔστι δὲ καὶ τμηθὲν τὸ ξύλον καλόν· πυκνόν τε γὰρ σφόδρα καὶ τῷ χρώματι λωτοειδές.]

III. Ἐν Λιβύῃ δὲ ὁ λωτὸς πλεῖστος καὶ κάλλιστος καὶ ὁ παλίουρος καὶ ἔν τισι μέρεσι τῇ τε Νασαμωνικῇ καὶ παρ' Ἄμμωνι καὶ ἄλλοις ὁ φοῖνιξ· ἐν δὲ τῇ Κυρηναίᾳ κυπάρισσος καὶ ἐλάαι τε κάλλισται καὶ ἔλαιον πλεῖστον. ἰδιώτατον δὲ πάντων τὸ σίλφιον· ἔτι κρόκον πολὺν ἡ χώρα φέρει καὶ εὔοσμον. ἔστι δὲ τοῦ λωτοῦ τὸ μὲν ὅλον δένδρον ἴδιον εὐμέγεθες ἡλίκον ἄπιος ἢ μικρὸν ἔλαττον· φύλλον δὲ ἐντομὰς ἔχον καὶ πρινώδες· τὸ μὲν ξύλον μέλαν· γένη δὲ αὐτοῦ πλείω διαφορὰς ἔχοντα τοῖς καρποῖς· ὁ δὲ καρπὸς

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[1] *πάθος* : *cf.* l. l. 1 n.

[2] *cf.* Schol. ad Nic. *Ther.* 683 of a sensitive plant called *σκορπίουρος* or *ἰσχύουσα*. *ἀφαυαινόμενα* conj. Scal.; *ἀφαυλινόμενα* UMVP$_2$Ald.

shoots and general form, but in the strange property[1] which belongs to it. Its appearance is spinous and the leaf is like ferns, but, when one touches the twigs, they say that the leaves as it were wither up[2] and collapse and then after a time come to life again and flourish. Such are the most conspicuous things peculiar to the country, to speak only of trees or shrubs. For we will speak later of the things which grow in the river and the marshes, when we come to speak of the other water plants.

[3] All the trees of this kind in that country are large, both in height and stoutness; thus at Memphis there is said to be a tree of such girth that three men cannot embrace it. The wood too, when split, is good, being of extremely close grain and in colour like the nettle-tree.

Of the trees and shrubs special to Libya.

III. [4] In Libya the *lotos* is most abundant and fairest; so also is the Christ's thorn, and in some parts, such as the Nasamonian district and near the temple of Zeus Ammon, the date-palm. In the Cyrenaica the cypress grows and the olives are fairest and the oil most abundant. Most special of all to this district is the silphium, and the land also bears abundant fragrant saffron-crocus. As to the *lotos*—the whole tree is peculiar, of good stature, as tall as a pear-tree, or nearly so; the leaf is divided and like that of the kermes-oak, and the wood is black. There are several sorts, which differ in their fruits; the fruit

[3] This section is evidently out of place; its probable place is at the end of § 10, so that the description will belong to the 'Egyptian plum.'

[4] See Index. Plin. 13. 104–106.

ἡλίκος κύαμος, πεπαίνεται δέ, ὥσπερ οἱ βότρυες, μεταβάλλων τὰς χροιάς· φύεται δέ, καθάπερ τὰ μύρτα, παρ' ἄλληλα πυκνὸς ἐπὶ τῶν βλαστῶν· ἐσθιόμενος δ' ὁ ἐν τοῖς Λωτοφάγοις καλουμένοις γλυκὺς καὶ ἡδὺς καὶ ἀσινὴς καὶ ἔτι πρὸς τὴν κοιλίαν ἀγαθός· ἡδίων δ' ὁ ἀπύρηνος, ἔστι γὰρ καὶ τοιοῦτόν τι γένος· ποιοῦσι δὲ καὶ οἶνον ἐξ αὐτοῦ.

2 Πολὺ δὲ τὸ δένδρον καὶ πολύκαρπον· τό γ' οὖν Ὀφέλλου στρατόπεδον, ἡνίκα ἐβάδιζεν εἰς Καρχηδόνα, καὶ τούτῳ φασὶ τραφῆναι πλείους ἡμέρας ἐπιλιπόντων τῶν ἐπιτηδείων. ἔστι μὲν οὖν καὶ ἐν τῇ νήσῳ τῇ Λωτοφαγιτίδι καλουμένῃ πολύς· αὕτη δ' ἐπίκειται καὶ ἀπέχει μικρόν· οὐ μὴν οὐθέν γε μέρος ἀλλὰ πολλῷ πλεῖον ἐν τῇ ἠπείρῳ· πλεῖστον γὰρ ὅλως ἐν τῇ Λιβύῃ, καθάπερ εἴρηται, τοῦτο καὶ ὁ παλίουρός ἐστιν· ἐν γὰρ Εὐεσπερίσι τούτοις καυσίμοις χρῶνται. διαφέρει δὲ οὗτος ὁ λωτὸς τοῦ παρὰ τοῖς Λωτοφάγοις.

3 Ὁ δὲ παλίουρος θαμνωδέστερος τοῦ λωτοῦ· φύλλον δὲ παρόμοιον ἔχει τῷ ἐνταῦθα, τὸν δὲ καρπὸν διάφορον· οὐ γὰρ πλατὺν ἀλλὰ στρογγύλον καὶ ἐρυθρόν, μέγεθος δὲ ἡλίκον τῆς κέδρου ἢ μικρῷ μεῖζον· πυρῆνα δὲ ἔχει οὐ συνεσθιόμενον καθάπερ ταῖς ῥοαῖς· ἡδὺν δὲ τὸν καρπόν· καὶ ἐάν τις οἶνον ἐπιχέῃ καὶ αὐτὸν ἡδίω γίνεσθαί φασι καὶ τὸν οἶνον ἡδίω ποιεῖν.

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[1] *cf.* Hdt. 4. 177; Athen. 14. 651; Scyl. *Peripl.* Lotophagi.

[2] A ruler of Cyrene, who invaded Carthaginian territory in conjunction with Agathocles, B.C. 308.

[3] *τῇ λωτοφαγιτίδι* conj. W.; *τῇ Λωτοφαγίᾳ Φάριδι* UMAld.

[4] *μέρος* : *μείων* conj. Sch. (*non minor* G).

is as large as a bean, and in ripening like grapes it changes its colour: it grows, like myrtle-berries, close together on the shoots; to eat, that which grows among the people called the Lotus-eaters[1] is sweet pleasant and harmless, and even good for the stomach; but that which has no stone is pleasanter (for there is also such a sort), and they also make wine from it.

The tree is abundant and produces much fruit; thus the army of Ophellas,[2] when it was marching on Carthage, was fed, they say, on this alone for several days, when the provisions ran short. It is abundant also in the island called the island of the Lotus-eaters;[3] this lies off the mainland at no great distance: it grows however in no less quantity,[4] but even more abundantly[5] on the mainland; for, as has been said,[6] this tree is common in Libya generally as well as the Christ's thorn; for in the islands called Euesperides[7] they use these trees as fuel. However this *lotos*[8] differs from that found in the land of the Lotus-eaters.

[9] The (Egyptian) 'Christ's thorn' is more shrubby than the *lotos*; it has a leaf like the tree of the same name of our country, but the fruit is different; for it is not flat, but round and red, and in size as large as the fruit of the prickly cedar or a little larger; it has a stone which is not eaten with the fruit, as in the case of the pomegranate, but the fruit is sweet, and, if one pours wine over it, they say that it becomes sweeter and that it makes the wine sweeter.

[5] πλεῖον U; ? πλείων with MV.
[6] 4. 3. 1. [7] *cf.* Hdt. 4. 191.
[8] *cf.* Hdt. 2. 96.
[9] See Index. Plin. 13. 111.

4 Ἔνιοι δὲ τὸ τοῦ λωτοῦ δένδρον θαμνῶδες εἶναι καὶ πολύκλαδον, τῷ στελέχει δὲ εὐπαχές· τὸν δὲ καρπὸν μέγα τὸ κάρυον ἔχειν· τὸ δ' ἐκτὸς οὐ σαρκῶδες ἀλλὰ δερματωδέστερον· ἐσθιόμενον δὲ οὐχ οὕτω γλυκὺν ὡς εὔστομον· καὶ τὸν οἶνον ὃν ἐξ αὐτοῦ ποιοῦσιν οὐ διαμένειν ἀλλ' ἢ δύο ἢ τρεῖς ἡμέρας εἶτ' ὀξύνειν. ἡδίω μὲν οὖν τὸν καρπὸν τὸν ἐν τοῖς Λωτοφάγοις, ξύλον δὲ κάλλιον τὸ ἐν Κυρηναίᾳ· θερμοτέραν δὲ εἶναι τὴν χώραν τὴν τῶν Λωτοφάγων· τοῦ ξύλου δὲ τὴν ῥίζαν εἶναι μελαντέραν μὲν πολὺ πυκνὴν δὲ ἧττον καὶ εἰς ἐλάττω χρησίμην· εἰς γὰρ τὰ ἐγχειρίδια καὶ τὰ ἐπικολλήματα χρῆσθαι, τῷ ξύλῳ δὲ εἴς τε τοὺς αὐλοὺς καὶ εἰς ἄλλα πλείω.

5 Ἐν δὲ τῇ μὴ ὑομένῃ τῆς Λιβύης ἄλλα τε πλείω φύεσθαι καὶ φοίνικας μεγάλους καὶ καλούς· οὐ μὴν ἀλλ' ὅπου μὲν φοῖνιξ ἁλμυρίδα τε εἶναι καὶ ἔφυδρον τὸν τόπον, οὐκ ἐν πολλῷ δὲ βάθει ἀλλὰ μάλιστα ἐπ' ὀργυίαις τρισίν. τὸ δ' ὕδωρ ἔνθα μὲν γλυκὺ σφόδρα ἔνθα δὲ ἁλυκὸν πλησίον ὄντων ἀλλήλοις· ὅπου δὲ τὰ ἄλλα φύεται ξηρὸν καὶ ἄνυδρον· ἐνιαχοῦ δὲ καὶ τὰ φρέατα εἶναι ἑκατὸν ὀργυιῶν, ὥστε ὑποζυγίοις ἀπὸ τροχηλιᾶς ἀνιμᾶν· δι' ὃ καὶ θαυμαστὸν πῶς ποτε ὠρύχθη τηλικαῦτα βάθη· τὸ δ' οὖν τῶν ὑδάτων τῶν ὑπὸ τοὺς φοίνικας καὶ ἐν Ἄμμωνος εἶναι διαφορὰν ἔχον τὴν εἰρημένην. φύεσθαι δὲ ἐν τῇ μὴ ὑομένῃ τὸ θύμον πολὺ καὶ ἄλλα ἴδιά τε καὶ πλείω γίνεσθαι

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[1] Sch. after Scal. places this section before § 3, making the account of this tree consecutive. [2] Plin. 13. 17. 104–106.
[3] εὔπαχες conj. R. Const.; εὐσταχές U; εὔσταχες MP_2Ald.
[4] *cf.* Hdt. 2. 96.

[1] Some say that the *lotos*[2] is shrubby and much branched, though it has a stout[3] stem; and that the stone in the fruit is large, while the outside is not fleshy but somewhat leathery; and that to eat it is not so much sweet as palatable; and that the wine which they make out of it does not keep more than two or three days, after which it gets sour; and so that the fruit[4] found in the Lotus-eaters' country is sweeter, while the wood in the Cyrenaica is better; and that the country of the Lotus-eaters is hotter; and that the root is much blacker than the wood, but of less close grain, and of use for fewer purposes; for they use it only for dagger-handles and tessellated work,[5] while the wood is used for pipes and many other things.

In the part of Libya where no rain falls they say that, besides many other trees, there grow tall and fine date-palms; however they add that, where the date-palm is found, the soil[6] is salt and contains water, and that at no great depth, not more than three fathoms. They say also that the water is in some places quite sweet, but in others quite close by it is brackish; that where however other things grow, the soil is dry and waterless; and that in places even the wells are a hundred fathoms deep, so that they draw water by means of a windlass worked by beasts. Wherefore it is wonderful how at any time digging to such depths was carried out. Such, they say, is the special character of the water supply which feeds the date-palms in the district also of the temple of Zeus Ammon. Further it is said that in the land where no rain falls thyme[7] is

[5] *ἐπικολλήματα*: lit. 'pieces glued on'; *cf.* Plin. *l.c.*
[6] *cf.* Hdt. 3. 183.
[7] *θύμον* mBas.H.; *θάμνον* UMVAld. *cf.* 6. 2. 3.

ἐνταῦθα, καὶ πτῶκα καὶ δορκάδα καὶ στρουθὸν
6 καὶ ἕτερα τῶν θηρίων. ἀλλὰ ταῦτα μὲν ἄδηλον
εἰ ἐκτοπίζει που πιόμενα· (διὰ γὰρ τὸ τάχος
δύναται μακράν τε καὶ ταχὺ παραγενέσθαι),
ἄλλως τε κεἰ δι' ἡμερῶν τινων πίνουσι, καθάπερ
καὶ τὰ ἥμερα παρὰ τρίτην ἢ τετάρτην ποτίζεται
ταῦτα· τὸ δὲ τῶν ἄλλων ζώων, οἷον ὄφεων
σαυρῶν καὶ τῶν τοιούτων, φανερὸν ὅτι ἄποτα.
τοὺς δὲ Λίβυας λέγειν ὅτι τὸν ὄνον ἐσθίει ταῦτα
ὃς καὶ παρ' ἡμῖν γίνεται, πολύπουν τε καὶ μέλαν
συσπειρώμενον εἰς ἑαυτό· τοῦτον δὲ πολύν τε
γίνεσθαι σφόδρα καὶ ὑγρὸν τὴν φύσιν εἶναι.

7 Δρόσον δὲ ἀεὶ πίπτειν ἐν τῇ μὴ ὑομένῃ πολλήν,
ὥστε δῆλον ὅτι τὸν μὲν φοίνικα καὶ εἴ τι ἄλλο
φύεται ἐν ἀνύδροις τό τε ἐκ τῆς γῆς ἀνιὸν ἐκτρέφει
καὶ πρὸς τούτῳ ἡ δρόσος. ἱκανὴ γὰρ ὡς κατὰ
μεγέθη καὶ τὴν φύσιν αὐτῶν ξηρὰν οὖσαν καὶ ἐκ
τοιούτων συνεστηκυῖαν. καὶ δένδρα μὲν ταῦτα
πλεῖστα καὶ ἰδιώτατα. περὶ δὲ τοῦ σιλφίου
λεκτέον ὕστερον ποῖόν τι τὴν φύσιν.

IV. Ἐν δὲ τῇ Ἀσίᾳ παρ' ἑκάστοις ἴδι' ἄττα
τυγχάνει· τὰ μὲν γὰρ φέρουσιν αἱ χῶραι τὰ δ'

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[1] *Lepus Aegyptiacus.* *cf.* Arist. *H.A.* 8. 28.
[2] ὡς κατὰ conj. Scal. from G ; ὥστε τὰ Ald.H.

abundant, and that there are various other peculiar plants there, and that there are found the hare[1] gazelle ostrich and other animals. However it is uncertain whether these do not migrate in order to find drink somewhere, (for by reason of their fleetness they are able to appear at a distant place in a short space of time), especially if they can go for several days without drinking, even as these animals, when domesticated, are only given drink every third or fourth day. While as to other animals, such as snakes lizards and the like, it is plain that they go without drink. And we are told that according to the Libyans, these animals eat the wood-louse, which is of the same kind that is found also in our country, being black, with many feet, and rolling itself into a ball ; this, they say, is extremely common and is juicy by nature.

They say also that dew always falls abundantly in the land in which no rain falls, so that it is plain that the date-palm, as well as anything else which grows in waterless places, is kept alive by the moisture which rises from the ground, and also by the dew. For the latter is sufficient, considering[2] the size of such trees and their natural character, which is dry and formed of dry components. And trees of that character are most abundant in, and most specially belong to such country. The character of the silphium we must discuss later.

Of the trees and herbs special to Asia.

IV. In different parts of Asia also there are special trees, for the soil of the various regions produces some but not others. [3]Thus they say that

[3] Plin. 16. 144.

οὐ φύουσιν· οἷον κιττὸν καὶ ἐλάαν[1] οὔ φασιν εἶναι τῆς Ἀσίας ἐν τοῖς ἄνω τῆς Συρίας ἀπὸ θαλάττης πένθ' ἡμερῶν· ἀλλ' ἐν Ἰνδοῖς φανῆναι κιττὸν ἐν τῷ ὄρει τῷ Μηρῷ καλουμένῳ, ὅθεν δὴ καὶ τὸν Διόνυσον εἶναι μυθολογοῦσι. δι' ὃ καὶ Ἀλέξανδρος ἀπ' ἐξοδίας[4] λέγεται[3] ἀπιὼν ἐστεφανωμένος κιττῷ εἶναι[5] καὶ αὐτὸς καὶ ἡ στρατιά· τῶν δὲ ἄλλων ἐν Μηδίᾳ μόνον· περικλείειν γὰρ αὕτη δοκεῖ καὶ συνάπτειν πως τῷ Πόντῳ. καίτοι γε διεφιλοτιμήθη Ἄρπαλος ἐν τοῖς παραδείσοις τοῖς περὶ Βαβυλῶνα φυτεύων πολλάκις καὶ πραγματευόμενος, ἀλλ' οὐδὲν ἐποίει πλέον· οὐ γὰρ ἐδύνατο ζῆν ὥσπερ τἆλλα τὰ ἐκ τῆς Ἑλλάδος. τοῦτο μὲν οὖν οὐ δέχεται ἡ χώρα διὰ τὴν τοῦ ἀέρος κρᾶσιν· ἀναγκαίως δὲ δέχεται καὶ πύξον καὶ φίλυραν· καὶ γὰρ περὶ ταῦτα πονοῦσιν οἱ ἐν τοῖς παραδείσοις. ἕτερα δὲ ἴδια φέρει καὶ δένδρα
2 καὶ ὑλήματα· καὶ ἔοικεν ὅλως ὁ τόπος ὁ πρὸς ἀνατολὰς καὶ μεσημβρίαν ὥσπερ καὶ ζῷα καὶ φυτὰ φέρειν ἴδια παρὰ τοὺς ἄλλους· οἷον ἥ τε Μηδία χώρα καὶ Περσὶς ἄλλα τε ἔχει πλείω καὶ τὸ μῆλον τὸ Μηδικὸν ἢ τὸ Περσικὸν καλούμενον. ἔχει δὲ τὸ δένδρον τοῦτο φύλλον μὲν ὅμοιον καὶ σχεδὸν ἴσον τῷ τῆς ἀνδράχλης, ἀκάνθας δὲ οἵας ἄπιος ἢ ὀξυάκανθος, λείας δὲ καὶ ὀξείας σφόδρα καὶ ἰσχυράς· τὸ δὲ μῆλον οὐκ ἐσθίεται μέν,

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[1] ἐλάαν conj. Spr.; ἐλάτην MSS. *cf.* Hdt. 1. 193; Xen. *Anab.* 4. 4. 13; Arr. *Ind.* 40.
[2] κιττὸν conj. W., *cf.* Arr. *Anab.* 5. 1. 6; καὶ τὴν UMV; καὶ τῷ Ald.H. [3] λέγεται add. W.
[4] ἐξοδίας UMVP; Ἰνδίας W. with Ald.
[5] κιττῷ εἶναι conj. W.; εἶτα μεῖναι U; εἶτα μὴ εἶναι MVPAld.

ivy and olive[1] do not grow in Asia in the parts of Syria which are five days' journey from the sea; but that in India ivy[2] appears on the mountain called Meros, whence, according to the tale, Dionysus came. Wherefore it is said[3] that Alexander, when he came back from an expedition,[4] was crowned with ivy,[5] himself and his army. But elsewhere in Asia it is said to grow only in Media, for that country seems in a way to surround and join on to the Euxine Sea.[6] However,[7] when Harpalus took great pains over and over again to plant it in the gardens of Babylon, and made a special point of it, he failed: since it could not live like the other things introduced from Hellas. The country then does not[8] admit this plant on account of the climate, and it grudgingly admits the box and the lime; for even these give much trouble to those engaged in the gardens. It also produces some peculiar trees and shrubs. And in general the lands of the East and South appear to have peculiar plants, as they have peculiar animals; for instance, Media and Persia have, among many others, that which is called the 'Median' or 'Persian apple' (citron).[9] This tree[10] has a leaf like to and almost identical with that of the andrachne, but it has thorns like those of the pear[11] or white-thorn, which however are smooth and very sharp and strong. The 'apple' is not

[6] *i.e.* and so Greek plants may be expected to grow there. But the text is probably defective; *cf.* the citation of this passage, Plut. *Quaest. Conv.* 3. 2. 1.

[7] *καίτοι γε.* This sentence does not connect properly with the preceding. [8] *οὐ* add. Sch.

[9] Plin. 12. 15 and 16; cited also Athen. 3. 26.

[10] *cf.* Verg. *G.* 2. 131–135.

[11] *ἄπιος*: ? here=*ἀχράς* R. Const. *cf. C.P.* 1. 15. 2.

εὔοσμον δὲ πάνυ καὶ τὸ φύλλον τοῦ δένδρου· κἂν εἰς ἱμάτια τεθῇ τὸ μῆλον ἄκοπα διατηρεῖ. χρήσιμον δ' ἐπειδὰν τύχῃ <τις> πεπωκὼς φάρμακον <θανάσιμον· δοθὲν γὰρ ἐν οἴνῳ διακόπτει τὴν κοιλίαν καὶ ἐξάγει τὸ φάρμακον·> καὶ πρὸς στόματος εὐωδίαν· ἐὰν γάρ τις ἐψήσῃ ἐν ζωμῷ, ἢ ἐν ἄλλῳ τινὶ τὸ ἔσωθεν τοῦ μήλου ἐκπιέσῃ εἰς τὸ στόμα καὶ καταροφήσῃ, ποιεῖ τὴν ὀσμὴν ἡδεῖαν.

3 σπείρεται δὲ τοῦ ἦρος εἰς πρασιὰς ἐξαιρεθὲν τὸ σπέρμα διειργασμένας ἐπιμελῶς, εἶτα ἀρδεύεται διὰ τετάρτης ἢ πέμπτης ἡμέρας· ὅταν δὲ ἀδρὸν ᾖ, διαφυτεύεται πάλιν τοῦ ἔαρος εἰς χωρίον μαλακὸν καὶ ἔφυδρον καὶ οὐ λίαν λεπτόν· φιλεῖ γὰρ τὰ τοιαῦτα. φέρει δὲ τὰ μῆλα πᾶσαν ὥραν· τὰ μὲν γὰρ ἀφῄρηται τὰ δὲ ἀνθεῖ τὰ δὲ ἐκπέττει. τῶν δὲ ἀνθῶν ὅσα, ὥσπερ εἴπομεν, ἔχει καθάπερ ἠλακάτην ἐκ μέσου τιν' ἐξέχουσαν, ταῦτά ἐστι γόνιμα, ὅσα δὲ μὴ ἄγονα. σπείρεται δὲ καὶ εἰς ὄστρακα διατετρημένα, καθάπερ καὶ οἱ φοίνικες. τοῦτο μὲν οὖν, ὥσπερ εἴρηται, περὶ τὴν Περσίδα καὶ τὴν Μηδίαν ἐστίν.

4 Ἡ δὲ Ἰνδικὴ χώρα τήν τε καλουμένην ἔχει συκῆν, ἣ καθίησιν ἐκ τῶν κλάδων τὰς ῥίζας ἀν' ἕκαστον ἔτος, ὥσπερ εἴρηται πρότερον· ἀφίησι δὲ οὐκ ἐκ τῶν νέων ἀλλ' ἐκ τῶν ἐνῶν καὶ ἔτι παλαιοτέρων· αὗται δὲ συνάπτουσαι τῇ γῇ ποιοῦσιν ὥσπερ δρύφακτον κύκλῳ περὶ τὸ δένδρον, ὥστε γίνεσθαι καθάπερ σκηνήν, οὗ δὴ καὶ

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[1] τις add. W. from Athen. *l.c.*; θανάσιμον . . . φάρμακον add. Sch. from Athen. *l.c.* [2] Plin. 11. 278; 12. 16.

[3] ἀδρὸν ᾖ W. from Athen. *l.c.*, whence διαφυτεύεται W. etc. for διαφυτεύηται Ald.H. ἀδρόν τι UMVAld.

eaten, but it is very fragrant, as also is the leaf of the tree. And if the 'apple' is placed among clothes, it keeps them from being moth-eaten. It is also useful when one[1] has drunk deadly poison; for being given in wine it upsets the stomach and brings up the poison; also for producing sweetness of breath;[2] for, if one boils the inner part of the 'apple' in a sauce, or squeezes it into the mouth in some other medium, and then inhales it, it makes the breath sweet. The seed is taken from the fruit and sown in spring in carefully tilled beds, and is then watered every fourth or fifth day. And, when it is growing vigorously,[3] it is transplanted, also in spring, to a soft well-watered place, where the soil is not too fine; for such places it loves. And it bears its 'apples' at all seasons; for when some have been gathered, the flower of others is on the tree and it is ripening others. Of the flowers, as we have said,[4] those which have, as it were, a distaff[5] projecting in the middle are fertile, while those that have it not are infertile. It is also sown, like date-palms, in pots[6] with a hole in them. This tree, as has been said, grows in Persia and Media.

[7] The Indian land has its so-called 'fig-tree' (banyan), which drops its roots from its branches every year, as has been said above[8]; and it drops them, not from the new branches, but from those of last year or even from older ones; these take hold of the earth and make, as it were, a fence about the tree, so that it becomes like a tent, in

[4] 1. 13. 4. [5] *i.e.* the pistil.

[6] Plin. 12. 16, *fictilibus in vasis, dato per cavernas radicibus spiramento*: the object, as Plin. explains, was to export it for medical use.

[7] Plin. 12. 22 and 23. [8] 1. 7. 3.

εἰώθασι διατρίβειν. εἰσὶ δὲ αἱ ῥίζαι φυόμεναι διάδηλοι πρὸς τοὺς βλαστούς· λευκότεραι γὰρ καὶ δασεῖαι καὶ σκολιαὶ καὶ ἄφυλλοι. ἔχει δὲ καὶ τὴν ἄνω κόμην πολλήν, καὶ τὸ ὅλον δένδρον εὔκυκλον καὶ τῷ μεγέθει μέγα σφόδρα· καὶ γὰρ ἐπὶ δύο στάδια ποιεῖν φασι τὴν σκιάν· καὶ τὸ πάχος τοῦ στελέχους ἔνια πλειόνων ἢ ἑξήκοντα βημάτων, τὰ δὲ πολλὰ τετταράκοντα. τὸ δέ γε φύλλον οὐκ ἔλαττον ἔχει πέλτης, καρπὸν δὲ σφόδρα μικρὸν ἡλίκον ἐρέβινθον ὅμοιον δὲ σύκῳ· δι' ὃ καὶ ἐκάλουν αὐτὸ οἱ Ἕλληνες συκῆν· ὀλίγον δὲ θαυμαστῶς τὸν καρπὸν οὐχ ὅτι κατὰ τὸ τοῦ δένδρου μέγεθος ἀλλὰ καὶ τὸ ὅλον. φύεται δὲ καὶ τὸ δένδρον περὶ τὸν Ἀκεσίνην ποταμόν.

5 Ἔστι δὲ καὶ ἕτερον δένδρον καὶ τῷ μεγέθει μέγα καὶ ἡδύκαρπον θαυμαστῶς καὶ μεγαλόκαρπον· καὶ χρῶνται τροφῇ τῶν Ἰνδῶν οἱ σοφοὶ καὶ μὴ ἀμπεχόμενοι.

Ἕτερον δὲ οὗ τὸ φύλλον τὴν μὲν μορφὴν πρόμηκες τοῖς τῶν στρουθῶν πτεροῖς ὅμοιον, ἃ παρατίθενται παρὰ τὰ κράνη, μῆκος δὲ ὡς διπηχυαῖον.

Ἄλλο τέ ἐστιν οὗ ὁ καρπὸς μακρὸς καὶ οὐκ εὐθὺς ἀλλὰ σκολιὸς ἐσθιόμενος δὲ γλυκύς. οὗτος ἐν τῇ κοιλίᾳ δηγμὸν ἐμποιεῖ καὶ δυσεντερίαν, δι' ὃ Ἀλέξανδρος ἀπεκήρυξε μὴ ἐσθίειν. ἔστι δὲ καὶ ἕτερον οὗ ὁ καρπὸς ὅμοιος τοῖς κρανέοις.

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[1] οὗ conj. W.; αἷς UMVAld.

[2] ἄφυλλοι conj. Dalec.; δίφυλλοι UVAld.; so also MH., omitting καὶ.

[3] ἑξήκοντα . . . τετταράκοντα MSS.; ἓξ . . . τεττάρων conj. Salm. *cf.* Plin. *l.c.*; Strabo 15. 1, 21.

which [1] men sometimes even live. The roots as they grow are easily distinguished from the branches, being whiter hairy crooked and leafless.[2] The foliage above is also abundant, and the whole tree is round and exceedingly large. They say that it extends its shade for as much as two furlongs; and the thickness of the stem is in some instances more than sixty [3] paces, while many specimens are as much as forty [3] paces through. The leaf is quite as large as a shield,[4] but the fruit is very small,[5] only as large as a chick-pea, and it resembles a fig. And this is why the Greeks [6] named this tree a 'fig-tree.' The fruit is curiously scanty, not only relatively to the size of the tree, but absolutely. The tree also grows near the river Akesines.[7]

There is also another tree [8] which is very large and has wonderfully sweet and large fruit; it is used for food by the sages of India who wear no clothes.

There is another tree [9] whose leaf is oblong in shape, like the feathers of the ostrich; this they fasten on to their helmets, and it is about two cubits long.

There is also another [10] whose fruit is long and not straight, but crooked, and it is sweet to the taste. This causes griping in the stomach and dysentery; wherefore Alexander ordered that it should not be eaten. There is also another [11] whose fruit is like the fruit of the cornelian cherry.

[4] πέλτη: a small round shield. [5] *cf. C.P.* 2. 10. 2.
[6] *i.e.* in Alexander's expedition. [7] Chenab.
[8] Jack-fruit. See Index App. (3). Plin. 12. 24.
[9] Banana. See Index App. (4).
[10] Mango. See Index App. (5). Plin. 12. 24.
[11] Jujube. See Index App. (6).

Καὶ ἕτερα δὲ πλείω καὶ διαφέροντα τῶν ἐν τοῖς Ἕλλησιν ἀλλ' ἀνώνυμα. θαυμαστὸν δ' οὐδὲν τῆς ἰδιότητος· σχεδὸν γάρ, ὥς γε δή τινές φασιν, οὐθὲν ὅλως τῶν δένδρων οὐδὲ τῶν ὑλημάτων οὐδὲ τῶν ποιωδῶν ὅμοιόν ἐστι τοῖς ἐν τῇ Ἑλλάδι πλὴν ὀλίγων.

6 Ἴδιον δὲ καὶ ἡ ἐβένη τῆς χώρας ταύτης· ταύτης δὲ δύο γένη, τὸ μὲν εὔξυλον καὶ καλὸν τὸ δὲ φαῦλον. σπάνιον δὲ τὸ καλὸν θάτερον δὲ πολύ. τὴν δὲ χρόαν οὐ θησαυριζομένη λαμβάνει τὴν εὔχρουν ἀλλ' εὐθὺς τῇ φύσει. ἔστι δὲ τὸ δένδρον θαμνῶδες, ὥσπερ ὁ κύτισος.

7 Φασὶ δ' εἶναι καὶ τέρμινθον, οἱ δ' ὅμοιον τερμίνθῳ, ὃ τὸ μὲν φύλλον καὶ τοὺς κλῶνας καὶ τἆλλα πάντα ὅμοια ἔχει τῇ τερμίνθῳ τὸν δὲ καρπὸν διάφορον· ὅμοιον γὰρ ταῖς ἀμυγδαλαῖς. εἶναι γὰρ καὶ ἐν Βάκτροις τὴν τέρμινθον ταύτην καὶ κάρυα φέρειν ἡλίκα ἀμύγδαλα διὰ τὸ μὴ μεγάλα· καὶ τῇ ὄψει δὲ παρόμοια, πλὴν τὸ κέλυφος οὐ τραχύ, τῇ δ' εὐστομίᾳ καὶ ἡδονῇ κρείττω τῶν ἀμυγδάλων. δι' ὃ καὶ χρῆσθαι τοὺς ἐκεῖ μᾶλλον.

8 Ἐξ ὧν δὲ τὰ ἱμάτια ποιοῦσι τὸ μὲν φύλλον ὅμοιον ἔχει τῇ συκαμίνῳ, τὸ δὲ ὅλον φυτὸν τοῖς κυνορόδοις ὅμοιον. φυτεύουσι δὲ ἐν τοῖς πεδίοις αὐτὸ κατ' ὄρχους, δι' ὃ καὶ πόρρωθεν ἀφορῶσι ἄμπελοι φαίνονται. ἔχει δὲ καὶ φοίνικας ἔνια

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[1] Plin. 12. 25.
[2] See Index. Plin. 12. 17-19.
[3] Pistachio-nut. See Index App. (7). Plin. 12. 25. Nic. *Ther.* 894.

There are also many more[1] which are different to those found among the Hellenes, but they have no names. There is nothing surprising in the fact that these trees have so special a character; indeed, as some say, there is hardly a single tree or shrub or herbaceous plant, except quite a few, like those in Hellas.

The ebony[2] is also peculiar to this country; of this there are two kinds, one with good handsome wood, the other inferior. The better sort is rare, but the inferior one is common. It does not acquire its good colour by being kept, but it is natural to it from the first. The tree is bushy, like laburnum.

Some say that a 'terebinth'[3] grows there also, others that it is a tree like the terebinth; this in leaf twigs and all other respects resembles that tree, but the fruit is different, being like almonds. In fact they say that this sort of terebinth grows also in Bactria and bears nuts only as big as almonds, inasmuch as they are not large for the size of the tree[4]; and they closely resemble almonds in appearance, except that the shell is not rough; and in palatableness and sweetness they are superior to almonds; wherefore the people of the country use them in preference to almonds.

[5]The trees from which they make their clothes have a leaf like the mulberry, but the whole tree resembles the wild rose. They plant them in the plains in rows, wherefore, when seen from a distance, they look like vines. Some parts also have many

[4] διὰ . . . μέγαλα: Sch. omits these words, and W. considers them corrupt; but G seems to have had them in his text. The translation is tentative.

[5] Cotton-plant. *cf.* 4. 7. 7 and 8. Plin. 12. 25.

μέρη πολλούς. καὶ ταῦτα μὲν ἐν δένδρου φύσει.

9 Φέρει δὲ καὶ σπέρματα ἴδια, τὰ μὲν τοῖς χεδροποῖς ὅμοια τὰ δὲ τοῖς πυροῖς καὶ ταῖς κριθαῖς. ἐρέβινθος μὲν γὰρ καὶ φακὸς καὶ τἆλλα τὰ παρ' ἡμῖν οὐκ ἔστιν· ἕτερα δ' ἐστὶν ὥστε παραπλήσια ποιεῖν τὰ ἐψήματα καὶ μὴ διαγιγνώσκειν, ὥς φασιν, ἂν μή τις ἀκούσῃ. κριθαὶ δὲ καὶ πυροὶ καὶ ἄλλο τι γένος ἀγρίων κριθῶν, ἐξ ὧν καὶ ἄρτοι ἡδεῖς καὶ χόνδρος καλός. ταύτας οἱ ἵπποι ἐσθίοντες τὸ πρῶτον διεφθείροντο, κατὰ μικρὸν δὲ οὖν ἐθισθέντες ἐν ἀχύροις οὐδὲν ἔπασχον.

10 Μάλιστα δὲ σπείρουσι τὸ καλούμενον ὄρυζον, ἐξ οὗ τὸ ἔψημα. τοῦτο δὲ ὅμοιον τῇ ζειᾷ καὶ περιπτισθὲν οἷον χόνδρος εὔπεπτον δέ, τὴν ὄψιν πεφυκὸς ὅμοιον ταῖς αἴραις καὶ τὸν πολὺν χρόνον ἐν ὕδατι, ἀποχεῖται δὲ οὐκ εἰς στάχυν ἀλλ' οἷον φόβην, ὥσπερ ὁ κέγχρος καὶ ὁ ἔλυμος. ἄλλο δὲ ὃ ἐκάλουν οἱ Ἕλληνες φακόν· τοῦτο δὲ ὅμοιον μὲν τῇ ὄψει καὶ τὸ βούκερας, θερίζεται δὲ περὶ Πλειάδος δύσιν.

11 Διαφέρει δὲ καὶ αὕτη ἡ χώρα τῷ τὴν μὲν φέρειν ἔνια τὴν δὲ μὴ φέρειν· ἡ γὰρ ὀρεινὴ καὶ ἄμπελον ἔχει καὶ ἐλάαν καὶ τὰ ἄλλα ἀκρόδρυα· πλὴν ἄκαρπον τὴν ἐλάαν, καὶ σχεδὸν καὶ τὴν φύσιν ὥσπερ μεταξὺ κοτίνου καὶ ἐλάας ἐστὶ καὶ

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[1] *cf.* 8. 4. 2. whence it appears that the original text here contained a fuller account. Plin. 18. 71.

[2] *Sorghum halepense.* [3] Sc. of Alexander.

[4] The verb seems to have dropped out (W.).

date-palms. So much for what come under the heading of 'trees.'

These lands bear also peculiar grains, some like those of leguminous plants, some like wheat and barley. For the chick-pea lentil and other such plants found in our country do not occur; but there are others, so that they make similar mashes, and one cannot, they say, tell the difference, unless one has been told. They have however barley wheat[1] and another kind of wild barley,[2] which makes sweet bread and good porridge. When the horses[3] ate this, at first it proved fatal to them, but by degrees they became accustomed to it mixed with bran and took no hurt.

But above all they sow the cereal called rice, of which they make their mash. This is like rice-wheat, and when bruised makes a sort of porridge, which is easily digested; in its appearance as it grows it is like darnel, and for most of its time of growth it is[4] in water; however it shoots[5] up not into an ear, but as it were into a plume,[6] like the millet and Italian millet. There was another plant[7] which the Hellenes[8] called lentil; this is like in appearance to 'ox-horn' (fenugreek), but it is reaped about the setting of the Pleiad.

Moreover this country shews differences in that part of it bears certain things which another part does not; thus the mountain country has the vine and olive and the other fruit-trees; but the olive is barren,[9] and in its character it is as it were almost between a wild and a cultivated olive, and so it

[5] ἀποχεῖται: *cf.* 8. 8. 1. [6] *cf.* 8. 3. 4.
[7] *Phaseolus Mungo*; see Index App. (8).
[8] *i. e.* of Alexander's expedition. [9] Plin. 12. 14.

τῇ ὅλῃ μορφῇ· καὶ τὸ φύλλον τοῦ μὲν πλατύτερον τοῦ δὲ στενότερον. ταῦτα μὲν οὖν κατὰ τὴν Ἰνδικήν.

12 Ἐν δὲ τῇ Ἀρίᾳ χώρᾳ καλουμένῃ ἄκανθά ἐστιν, ἐφ' ἧς γίνεται δάκρυον ὅμοιον τῇ σμύρνῃ καὶ τῇ ὄψει καὶ τῇ ὀσμῇ· τοῦτο δὲ ὅταν ἐπιλάμψῃ ὁ ἥλιος καταρρεῖ. πολλὰ δὲ καὶ ἄλλα παρὰ τὰ ἐνταῦθα καὶ ἐν τῇ χώρᾳ καὶ ἐν τοῖς ποταμοῖς γίνεται. ἐν ἑτέροις δὲ τόποις ἐστὶν ἄκανθα λευκὴ τρίοζος, ἐξ ἧς καὶ σκυτάλια καὶ βακτηρίας ποιοῦσιν· ὀπώδης δὲ καὶ μανή· ταύτην δὲ καλοῦσιν Ἡρακλέους.

Ἄλλο δὲ ὕλημα μέγεθος μὲν ἡλίκον ῥάφανος, τὸ δὲ φύλλον ὅμοιον δάφνῃ καὶ τῷ μεγέθει καὶ τῇ μορφῇ. τοῦτο δ' εἴ τι φάγοι ἐναποθνήσκει. δι' ὃ καὶ ὅπου ἵπποι τούτους ἐφύλαττον διὰ χειρῶν.

13 Ἐν δὲ τῇ Γεδρωσίᾳ χώρᾳ πεφυκέναι φασὶν ἓν μὲν ὅμοιον τῇ δάφνῃ φύλλον ἔχον, οὗ τὰ ὑποζύγια καὶ ὁτιοῦν εἰ φάγοι μικρὸν ἐπισχόντα διεφθείροντο παραπλησίως διατιθέμενα καὶ σπώμενα ὁμοίως τοῖς ἐπιλήπτοις.

Ἕτερον δὲ ἄκανθάν τινα εἶναι· ταύτην δὲ φύλλον μὲν οὐδὲν ἔχειν πεφυκέναι δ' ἐκ μιᾶς ῥίζης· ἐφ' ἑκάστῳ δὲ τῶν ὄζων ἄκανθαν ἔχειν ὀξεῖαν σφόδρα, καὶ τούτων δὲ καταγνυμένων ἢ προστριβομένων ὀπὸν ἐκρεῖν πολύν, ὃς ἀποτυφλοῖ

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[1] καὶ σχεδὸν . . . μορφῇ conj. W.; σχεδὸν δὲ καὶ τὴν φύσιν ὥσπερ μετ. κοτ. καὶ ἐλ. ἐστι δὲ τῇ ὅλῃ μορφῇ καὶ τὸ φ. Ald.; so also U, omitting the first καί.

[2] *Balsamodendron Mukul*; see Index App. (9). Plin. 12. 33.

is also in its general appearance,[1] and the leaf is broader than that of the one and narrower than that of the other. So much for the Indian land.

In the country called Aria there is a 'thorn'[2] on which is found a gum resembling myrrh[3] in appearance and smell, and this drops when the sun shines on it. There are also many other plants besides those of our land, both in the country and in its rivers. In other parts there is a white 'thorn'[4] which branches in three, of which they make batons and sticks; its wood is sappy and of loose texture, and they call it the thorn 'of Herakles.'

There is another shrub[5] as large as a cabbage, whose leaf is like that of the bay in size and shape. And if any animal should eat this, it is certain to die of it. Wherefore, wherever there were horses,[6] they kept them under control.

In Gedrosia they say that there grows one tree[7] with a leaf like that of the bay, of which if the beasts or anything else ate, they very shortly died with the same convulsive symptoms as in epilepsy.

And they say that another tree[8] there is a sort of 'thorn' (spurge), and that this has no leaf and grows from a single root; and on each of its branches it has a very sharp spine, and if these are broken or bruised a quantity of juice flows out, which blinds animals or

[3] *σμύρνῃ* conj. Sch. from 9. 1. 2; Plin. *l.c.*; *τῇ ἰλλυρίᾳ* Ald. H.

[4] See Index.

[5] *Asafoetida*; see Index App. (10). Plin. 12. 33.

[6] *i.e.* in Alexander's expedition. Probably a verb, such as *ὠσφραίνοντο*, has dropped out after *ἵπποι* (Sch.). *Odore equos invitans* Plin. *l.c.*

[7] *Nerium odorum*; see Index App. (11). *cf.* 4. 4. 13; Strabo 15. 2. 7; Plin. *l.c.*

[8] Plin. *l.c.*; Arrian, *Anab.* 6. 22. 7.

τἆλλα ζῶα πάντα καὶ πρὸς τοὺς ἀνθρώπους εἴ τις προσραίνειεν αὐτοῖς. ἐν δὲ τόποις τισὶ πεφυκέναι τινὰ βοτάνην, ὑφ' ἣ συνεσπειρωμένους ὄφεις εἶναι μικροὺς σφόδρα· τούτοις δ' εἴ τις ἐμβὰς πληγείη θνήσκειν. ἀποπνίγεσθαι δὲ καὶ ἀπὸ τῶν φοινίκων τῶν ὠμῶν εἴ τις φάγοι, καὶ τοῦτο ὕστερον κατανοηθῆναι. τοιαῦται μὲν οὖν δυνάμεις καὶ ζώων καὶ φυτῶν ἴσως καὶ παρ' ἄλλοις εἰσί.

14 Περιττότερα δὲ τῶν φυομένων καὶ πλεῖστον ἐξηλλαγμένα πρὸς τὰ ἄλλα τὰ εὔοσμα τὰ περὶ Ἀραβίαν καὶ Συρίαν καὶ Ἰνδούς, οἷον ὅ τε λιβανωτὸς καὶ ἡ σμύρνα καὶ ἡ κασία καὶ τὸ ὀποβάλσαμον καὶ τὸ κινάμωμον καὶ ὅσα ἄλλα τοιαῦτα· περὶ ὧν ἐν ἄλλοις εἴρηται διὰ πλειόνων. ἐν μὲν οὖν τοῖς πρὸς ἕω τε καὶ μεσημβρίαν καὶ ταῦτ' ἴδια καὶ ἕτερα δὲ τούτων πλείω ἐστίν.

V. Ἐν δὲ τοῖς πρὸς ἄρκτον οὐχ ὁμοίως· οὐθὲν γὰρ ὅτι ἄξιον λόγου λέγεται παρὰ τὰ κοινὰ τῶν δένδρων ἃ καὶ φιλόψυχρά τε τυγχάνει καὶ ἔστι καὶ παρ' ἡμῖν, οἷον πεύκη δρῦς ἐλάτη πύξος διοσβάλανος φίλυρα καὶ τὰ ἄλλα δὲ τὰ τοιαῦτα· σχεδὸν γὰρ οὐδὲν ἕτερον παρὰ ταῦτά ἐστιν, ἀλλὰ τῶν ἄλλων ὑλημάτων ἔνια ἃ τοὺς ψυχροὺς μᾶλλον ζητεῖ τόπους, καθάπερ κενταύριον ἀψίνθιον, ἔτι δὲ τὰ φαρμακώδη ταῖς ῥίζαις καὶ τοῖς ὀποῖς, οἷον ἑλλέβορος ἑλατήριον σκαμμωνία, σχεδὸν πάντα τὰ ῥιζοτομούμενα.

2 Τὰ μὲν γὰρ ἐν τῷ Πόντῳ καὶ τῇ Θράκῃ γίνεται,

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[1] τὰ ἀλλὰ δὲ : ? om. τὰ ; δὲ om. Sch.

even a man, if any drops of it should fall on him. Also they say that in some parts grows a herb under which very small snakes lie coiled up, and that, if anyone treads on these and is bitten, he dies. They also say that, if anyone should eat of unripe dates, he chokes to death, and that this fact was not discovered at first. Now it may be that animals and plants have such properties elsewhere also.

Among the plants that grow in Arabia Syria and India the aromatic plants are somewhat exceptional and distinct from the plants of other lands; for instance, frankincense myrrh cassia balsam of Mecca cinnamon and all other such plants, about which we have spoken at greater length elsewhere. So in the parts towards the east and south there are these special plants and many others besides.

Of the plants special to northern regions.

V. In the northern regions it is not so, for nothing worthy of record is mentioned except the ordinary trees which love the cold and are found also in our country, as fir oak silver-fir box chestnut lime, as well as other similar trees. There is hardly any other[1] besides these; but of shrubs there are some which for choice[2] seek cold regions, as centaury and wormwood, and further those that have medicinal properties in their roots and juices, such as hellebore squirting cucumber scammony, and nearly all those whose roots are gathered.[3]

Some of these grow in Pontus and Thrace, some

[2] I have moved μᾶλλον, which in the MSS. comes before τῶν ἄλλων.

[3] *i.e.* which have medicinal uses.

τὰ δὲ περὶ τὴν Οἴτην καὶ τὸν Παρνασὸν καὶ τὸ Πήλιον καὶ τὴν Ὄσσαν καὶ τὸ Τελέθριον· καὶ ἐν τούτοις δέ τινές φασι πλεῖστον· πολλὰ δὲ καὶ ἐν τῇ Ἀρκαδίᾳ καὶ ἐν τῇ Λακωνικῇ· φαρμακώδεις γὰρ καὶ αὗται. τῶν δὲ εὐωδῶν οὐδὲν ἐν ταύταις, πλὴν ἶρις ἐν τῇ Ἰλλυρίδι καὶ περὶ τὸν Ἀδρίαν· ταύτῃ γὰρ χρηστὴ καὶ πολὺ διαφέρουσα τῶν ἄλλων· ἀλλ' ἐν τοῖς ἀλεεινοῖς καὶ τοῖς πρὸς μεσημβρίαν ὥσπερ ἀντικείμενα τὰ εὐώδη. ἔχουσι δὲ καὶ κυπάριττον οἱ ἀλεεινοὶ μᾶλλον, ὥσπερ Κρήτη Λυκία Ῥόδος, κέδρον δὲ καὶ τὰ Θρᾴκια ὄρη καὶ τὰ Φρύγια.

3 Τῶν δὲ ἡμερουμένων ἥκιστά φασιν ἐν τοῖς ψυχροῖς ὑπομένειν δάφνην καὶ μυρρίνην, καὶ τούτων δὲ ἧττον ἔτι τὴν μυρρίνην· σημεῖον δὲ λέγουσιν ὅτι ἐν τῷ Ὀλύμπῳ δάφνη μὲν πολλή, μύρρινος δὲ ὅλως οὐκ ἔστιν. ἐν δὲ τῷ Πόντῳ περὶ Παντικάπαιον οὐδ' ἕτερον καίπερ σπουδαζόντων καὶ πάντα μηχανωμένων πρὸς τὰς ἱεροσύνας· συκαῖ δὲ πολλαὶ καὶ εὐμεγέθεις καὶ ῥοιαὶ δὲ περισκεπαζόμεναι· ἄπιοι δὲ καὶ μηλέαι πλεῖσται καὶ παντοδαπώταται καὶ χρησταί· αὗται δ' ἐαριναὶ πλὴν εἰ ἄρα ὄψιαι· τῆς δὲ ἀγρίας ὕλης ἐστὶ δρῦς πτελέα μελία καὶ ὅσα τοιαῦτα· πεύκη δὲ καὶ ἐλάτη καὶ πίτυς οὐκ ἔστιν οὐδὲ ὅλως οὐδὲν ἔνδαδον· ὑγρὰ δὲ αὕτη καὶ χείρων πολὺ τῆς Σινωπικῆς, ὥστ' οὐδὲ πολὺ χρῶνται αὐτῇ πλὴν πρὸς τὰ ὑπαίθρια. ταῦτα

[1] Τελέθριον conj. Sch. (in Euboea), *cf.* 9. 15. 4; Πελέθριον UMVP; Παρθένιον Ald.G.

[2] Whose rhizome was used for perfumes; *cf.* 1. 7. 2; *de odor.* 22. 23. 28. 32; Dykes, *The Genus Iris*, p. 237, gives an interesting account of the modern uses of 'orris-root.'

about Oeta Parnassus Pelion Ossa and Telethrion,[1] and in these parts some say that there is great abundance; so also is there in Arcadia and Laconia, for these districts too produce medicinal plants. But of the aromatic plants none grows in these lands, except the iris[2] in Illyria on the shores of the Adriatic; for here it is excellent and far superior to that which grows elsewhere; but in hot places and those which face the south the fragrant plants grow, as if by contrast to the medicinal plants. And the warm places have also the cypress in greater abundance; for instance, Crete Lycia Rhodes, while the prickly cedar grows in the Thracian and the Phrygian mountains.

Of cultivated plants they say that those least able to thrive in cold regions are the bay and myrtle, especially the myrtle, and they give for proof[3] that on Mount Olympus the bay is abundant, but the myrtle does not occur at all. In Pontus about Panticapaeum neither grows, though they are anxious to grow them and take special pains[4] to do so for religious purposes. But there are many well grown fig-trees and pomegranates, which are given shelter; pears and apples are abundant in a great variety of forms and are excellent. These are spring-fruiting trees, except that they may fruit later here than elsewhere. Of wild trees there are oak elm manna-ash and the like (while there is no fir silver-fir nor Aleppo pine, nor indeed any resinous tree). But the wood of such trees[5] in this country is damp and much inferior to that of Sinope, so that they do not much use it except for outdoor purposes. These

[3] Plin. 16. 137.
[4] Plin., *l.c.*, says that Mithridates made this attempt.
[5] *i.e.* oak, etc.

μὲν οὖν περὶ τὸν Πόντον ἢ ἔν τισί γε τόποις αὐτοῦ.

4 Ἐν δὲ τῇ Προποντίδι γίνεται καὶ μύρρινος καὶ δάφνη πολλαχοῦ ἐν τοῖς ὄρεσιν. ἴσως δ' ἔνια καὶ τῶν τόπων ἴδια θετέον· ἕκαστοι γὰρ ἔχουσι τὰ διαφέροντα, ὥσπερ εἴρηται, κατὰ τὰς ὕλας οὐ μόνον τῷ βελτίω καὶ χείρω τὴν αὐτὴν ἔχειν ἀλλὰ καὶ τῷ φέρειν ἢ μὴ φέρειν· οἷον ὁ μὲν Τμῶλος ἔχει καὶ ὁ Μύσιος Ὄλυμπος πολὺ τὸ κάρυον καὶ τὴν διοσβάλανον, ἔτι δὲ ἄμπελον καὶ μηλέαν καὶ ῥόαν· ἡ δὲ Ἴδη τὰ μὲν οὐκ ἔχει τούτων τὰ δὲ σπάνια· περὶ δὲ Μακεδονίαν καὶ τὸν Πιερικὸν Ὄλυμπον τὰ μὲν ἔστι τὰ δ' οὐκ ἔστι τούτων· ἐν δὲ τῇ Εὐβοίᾳ καὶ περὶ τὴν Μαγνησίαν τὰ μὲν Εὐβοϊκὰ πολλὰ τῶν δὲ ἄλλων οὐθέν· οὐδὲ δὴ περὶ τὸ Πήλιον οὐδὲ τὰ ἄλλα τὰ ἐνταῦθα ὄρη.

5 Βραχὺς δ' ἐστὶ τόπος ὃς ἔχει καὶ ὅλως τὴν ναυπηγήσιμον ὕλην· τῆς μὲν γὰρ Εὐρώπης δοκεῖ τὰ περὶ τὴν Μακεδονίαν καὶ ὅσα τῆς Θρᾴκης καὶ περὶ Ἰταλίαν· τῆς δὲ Ἀσίας τά τε ἐν Κιλικίᾳ καὶ τὰ ἐν Σινώπῃ καὶ Ἀμίσῳ, ἔτι δὲ ὁ Μύσιος Ὄλυμπος καὶ ἡ Ἴδη πλὴν οὐ πολλήν· ἡ γὰρ Συρία κέδρον ἔχει καὶ ταύτῃ χρῶνται πρὸς τὰς τριήρεις.

6 Ἀλλὰ καὶ τὰ φίλυδρα καὶ τὰ παραποτάμια ταῦθ' ὁμοίως· ἐν μὲν γὰρ τῷ Ἀδρίᾳ πλάτανον οὔ φασιν εἶναι πλὴν περὶ τὸ Διομήδους ἱερόν· σπανίαν δὲ καὶ ἐν Ἰταλίᾳ πάσῃ· καίτοι πολλοὶ καὶ μεγάλοι ποταμοὶ παρ' ἀμφοῖν· ἀλλ' οὐκ

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[1] See Index.

[2] καὶ ὅσα: text probably defective, but sense clear. ? καὶ ὅσα τῆς Θ. ἔχει καὶ τὰ περὶ Ἰ.

are the trees of Pontus, or at least of certain districts of that country.

In the land of Propontis myrtle and bay are found in many places on the mountains. Perhaps however some trees should be put down as special to particular places. For each district, as has been said, has different trees, differing not only in that the same trees occur but of variable quality, but also as to producing or not producing some particular tree. For instance, Tmolus and the Mysian Olympus have the hazel and chestnut[1] in abundance, and also the vine apple and pomegranate; while Mount Ida has some of these not at all and others only in small quantity; and in Macedonia and on the Pierian Olympus some of these occur, but not others; and in Euboea and Magnesia the sweet chestnut[1] is common, but none of the others is found; nor yet on Pelion or the other mountains of that region.

Again it is only a narrow extent of country which produces wood fit for shipbuilding at all, namely in Europe the Macedonian region, and certain parts[2] of Thrace and Italy; in Asia Cilicia Sinope and Amisus, and also the Mysian Olympus, and Mount Ida; but in these parts it is not abundant. For Syria has Syrian cedar, and they use this for their galleys.

The like is true of trees which love water and the riverside; in the Adriatic region they say that the plane is not found, except near the Shrine of Diomedes,[3] and that it is scarce throughout Italy[4]; yet there are many large rivers in both countries, in spite of which the localities do not seem to

[3] On one of the islands of Diomedes, off the coast of Apulia; now called Isole di Tremiti. *cf.* Plin. 12. 6.

[4] *cf.* 2. 8. 1 n.

ἔοικε φέρειν ὁ τόπος· ἐν Ῥηγίῳ γοῦν ἃς Διονύσιος πρεσβύτερος ὁ τύραννος ἐφύτευσεν ἐν τῷ παραδείσῳ, αἵ εἰσι νῦν ἐν τῷ γυμνασίῳ, φιλοτιμηθεῖσαι οὐ δεδύνηνται λαβεῖν μέγεθος.

7 Ἔνιοι δὲ πλείστην ἔχουσι πλάτανον, οἱ δὲ πτελέαν καὶ ἰτέαν, οἱ δὲ μυρίκην, ὥσπερ ὁ Αἶμος. ὥστε τὰ μὲν τοιαῦτα, καθάπερ ἐλέχθη, τῶν τόπων ἴδια θετέον ὁμοίως ἔν τε τοῖς ἀγρίοις καὶ τοῖς ἡμέροις. οὐ μὴν ἀλλὰ τάχ' ἂν εἴη καὶ τούτων ἐπί τινων ὥστε διακοσμηθέντων δύνασθαι τὴν χώραν φέρειν, ὃ καὶ νῦν ξυμβαῖνον ὁρῶμεν καὶ ἐπὶ ζώων ἐνίων καὶ φυτῶν.

VI. Μεγίστην δὲ διαφορὰν αὐτῆς τῆς φύσεως τῶν δένδρων καὶ ἁπλῶς τῶν ὑλημάτων ὑπολη-πτέον ἣν καὶ πρότερον εἴπομεν, ὅτι τὰ μὲν ἔγγαια τὰ δ' ἔνυδρα τυγχάνει, καθάπερ τῶν ζώων, καὶ τῶν φυτῶν· οὐ μόνον ἐν τοῖς ἕλεσι καὶ ταῖς λίμναις καὶ τοῖς ποταμοῖς γὰρ ἀλλὰ καὶ ἐν τῇ θαλάττῃ φύεται καὶ ὑλήματα ἔνια ἔν τε τῇ ἔξω καὶ δένδρα· ἐν μὲν γὰρ τῇ περὶ ἡμᾶς μικρὰ πάντα τὰ φυόμενα, καὶ οὐδὲν ὑπερέχον ὡς εἰπεῖν τῆς θαλάττης· ἐν ἐκείνῃ δὲ καὶ τὰ τοιαῦτα καὶ ὑπερέχοντα, καὶ ἕτερα δὲ μείζω δένδρα.

2 Τὰ μὲν οὖν περὶ ἡμᾶς ἐστι τάδε· φανερώτατα μὲν καὶ κοινότατα πᾶσιν τό τε φῦκος καὶ τὸ βρύον καὶ ὅσα ἄλλα τοιαῦτα· φανερώτατα δὲ καὶ

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[1] φιλοτιμηθεῖσαι conj. St.; φιλοτιμηθεὶς MSS; Plin. 12. 7.
[2] θαλάττης conj. Scal. from G; ἐλάτης Ald. H.

produce this tree. At any rate those which King Dionysius the Elder planted at Rhegium in the park, and which are now in the grounds of the wrestling school and are thought much of,[1] have not been able to attain any size.

Some of these regions however have the plane in abundance, and others the elm and willow, others the tamarisk, such as the district of Mount Haemus. Wherefore such trees we must, as was said, take to be peculiar to their districts, whether they are wild or cultivated. However it might well be that the country should be able to produce some of these trees, if they were carefully cultivated: this we do in fact find to be the case with some plants, as with some animals.

Of the aquatic plants of the Mediterranean.

VI. However the greatest difference in the natural character itself of trees and of tree-like plants generally we must take to be that mentioned already, namely, that of plants, as of animals, some belong to the earth, some to water. Not only in swamps, lakes and rivers, but even in the sea there are some tree-like growths, and in the ocean there are even trees. In our own sea all the things that grow are small, and hardly any of them rise above the surface[2]; but in the ocean we find the same kinds rising above the surface, and also other larger trees.

Those found in our own waters are as follows: most conspicuous of those which are of general occurrence are seaweed[3] oyster-green and the like; most obvious of those peculiar to certain parts are the

[3] Plin. 13. 135.

ἰδιώτατα κατὰ τοὺς τόπους ἐλάτη συκῆ δρῦς ἄμπελος φοῖνιξ. τούτων δὲ τὰ μὲν πρόσγεια τὰ δὲ πόντια τὰ δ' ἀμφοτέρων τῶν τόπων κοινά. καὶ τὰ μὲν πολυειδῆ, καθάπερ τὸ φῦκος, τὰ δὲ μίαν ἰδέαν ἔχοντα. τοῦ γὰρ φύκους τὸ μέν ἐστι πλατύφυλλον ταινιοειδὲς χρῶμα ποῶδες ἔχον, ὃ δὴ καὶ πράσον καλοῦσί τινες, οἱ δὲ ζωστῆρα· ῥίζαν δὲ ἔχει δασεῖαν ἔξωθεν ἔνδοθεν δὲ λεπυριώδη, μακρὰν δὲ ἐπιεικῶς καὶ εὐπαχῆ παρομοίαν τοῖς κρομυογητείοις.

3 Τὸ δὲ τριχόφυλλον, ὥσπερ τὸ μάραθον, οὐ ποῶδες ἀλλ' ἔξωχρον οὐδὲ ἔχον καυλὸν ἀλλ' ὀρθόν πως ἐν αὑτῷ· φύεται δὲ τοῦτο ἐπὶ τῶν ὀστράκων καὶ τῶν λίθων, οὐχ ὥσπερ θάτερον πρὸς τῇ γῇ· πρόσγεια δ' ἄμφω, καὶ τὸ μὲν τριχόφυλλον πρὸς αὐτῇ τῇ γῇ, πολλάκις δὲ ὥσπερ ἐπικλύζεται μόνον ὑπὸ τῆς θαλάττης, θάτερον δὲ ἀνωτέρω.

4 Γίνεται δὲ ἐν μὲν τῇ ἔξω τῇ περὶ Ἡρακλέους στήλας θαυμαστόν τι τὸ μέγεθος, ὥς φασι, καὶ τὸ πλάτος μεῖζον ὡς παλαιστιαῖον. φέρεται δὲ τοῦτο εἰς τὴν ἔσω θάλατταν ἅμα τῷ ῥῷ τῷ ἔξωθεν καὶ καλοῦσιν αὐτὸ πράσον· ἐν ταύτῃ δ' ἔν τισι τόποις ὥστ' ἐπάνω τοῦ ὀμφαλοῦ. λέγεται δὲ ἐπέτειον εἶναι καὶ φύεσθαι μὲν τοῦ ἦρος λήγοντος, ἀκμάζειν δὲ τοῦ θέρους, τοῦ μετοπώρου δὲ φθίνειν, κατὰ δὲ τὸν χειμῶνα ἀπόλλυσθαι καὶ ἐκπίπτειν. ἅπαντα δὲ καὶ τἆλλα τὰ φυόμενα χείρω καὶ ἀμαυρότερα γίνεσθαι τοῦ χειμῶνος.

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[1] See Index : συκῆ, δρῦς, etc.

[2] ταινιοειδὲς conj. Dalec. : τετανοειδὲς UP_2Ald.H.; τὰ τενοειδὲς MV. [3] *cf.* Diosc. 4. 99 ; Plin. 13. 136.

sea-plants called 'fir' 'fig' 'oak' 'vine' 'palm.'[1] Of these some are found close to land, others in the deep sea, others equally in both positions. And some have many forms, as seaweed, some but one. Thus of seaweed there is the broad-leaved kind, riband-like[2] and green in colour, which some call 'green-weed' and others 'girdle-weed.' This has a root which on the outside is shaggy, but the inner part is made of several coats, and it is fairly long and stout, like *kromyogeteion* (a kind of onion).

[3] Another kind has hair-like leaves like fennel, and is not green but pale yellow; nor has it a stalk, but it is, as it were, erect in itself; this grows on oyster-shells and stones, not, like the other, attached to the bottom: but both are plants of the shore, and the hair-leaved kind grows close to land, and sometimes is merely washed over by the sea[4]; while the other is found further out.

Again in the ocean about the pillars of Heracles there is a kind[5] of marvellous size, they say, which is larger, about a palmsbreadth.[6] This is carried into the inner sea along with the current from the outer sea, and they call it 'sea-leek' (riband-weed); and in this sea in some parts it grows higher than a man's waist. It is said to be annual, and to come up at the end of spring, and to be at its best in summer, and to wither in autumn, while in winter it perishes and is thrown up on shore. Also, they say, all the other plants of the sea become weaker and feebler in winter. These then are, one may say, the

[4] *i.e.* grows above low water mark.

[5] See Index: *φῦκος* (2).

[6] *i.e.* the 'leaf': the comparison is doubtless with *τὸ πλατύ*, § 2; *ὡς* UMVAld.; *ἢ* W. after Sch.'s conj.

ταῦτα μὲν οὖν οἷον πρόσγεια περί γε τὴν θάλατταν. τὸ δὲ πόντιον φῦκος ὃ οἱ σπογγιεῖς ἀνακολυμβῶσι πελάγιον.

5 Καὶ ἐν Κρήτῃ δὲ φύεται πρὸς τῇ γῇ ἐπὶ τῶν πετρῶν πλεῖστον καὶ κάλλιστον ᾧ βάπτουσιν οὐ μόνον τὰς ταινίας ἀλλὰ καὶ ἔρια καὶ ἱμάτια· καὶ ἕως ἂν ᾖ πρόσφατος ἡ βαφή, πολὺ καλλίων ἡ χρόα τῆς πορφύρας· γίνεται δ' ἐν τῇ προσβόρρῳ καὶ πλεῖον καὶ κάλλιον, ὥσπερ αἱ σπογγιαὶ καὶ ἄλλα τοιαῦτα.

6 Ἄλλο δ' ἐστὶν ὅμοιον τῇ ἀγρώστει· καὶ γὰρ τὸ φύλλον παραπλήσιον ἔχει καὶ τὴν ῥίζαν γονατώδη καὶ μακρὰν καὶ πεφυκυῖαν πλαγίαν, ὥσπερ ἡ τῆς ἀγρώστιδος· ἔχει δὲ καὶ καυλὸν καλαμώδη, καθάπερ ἡ ἄγρωστις· μεγέθει δὲ ἔλαττον πολὺ τοῦ φύκους.

Ἄλλο δὲ τὸ βρύον, ὃ φύλλον μὲν ἔχει ποώδες τῇ χρόᾳ, πλατὺ δὲ καὶ οὐκ ἀνόμοιον ταῖς θριδακίναις, πλὴν ῥυτιδωδέστερον καὶ ὥσπερ συνεσπασμένον. καυλὸν δὲ οὐκ ἔχει, ἀλλ' ἀπὸ μιᾶς ἀρχῆς πλείω τὰ τοιαῦτα καὶ πάλιν ἀπ' ἄλλης· φύεται δὲ ἐπὶ τῶν λίθων τὰ τοιαῦτα πρὸς τῇ γῇ καὶ τῶν ὀστράκων. καὶ τὰ μὲν ἐλάττω σχεδὸν ταῦτ' ἐστίν.

7 Ἡ δὲ δρῦς καὶ ἡ ἐλάτη παράγειοι μὲν ἄμφω· φύονται δ' ἐπὶ λίθοις καὶ ὀστράκοις ῥίζας μὲν οὐκ ἔχουσαι, προσπεφυκυῖαι δὲ ὥσπερ αἱ λεπάδες. ἀμφότεραι μὲν οἷον σαρκόφυλλα· προμηκέστερον δὲ τὸ φύλλον πολὺ καὶ παχύτερον τῆς ἐλάτης

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[1] Plin. 13. 136, *cf.* 32. 22; Diosc. 4. 99.
[2] litmus; see Index, *φῦκος* (5).
[3] Plin. *l.c.*; grass-wrack, see Index, *φῦκος* (6).

sea-plants which are found near the shore. But the 'seaweed of ocean,' which is dived for by the sponge-fishers, belongs to the open sea.

[1] In Crete there is an abundant and luxuriant growth [2] on the rocks close to land, with which they dye not only their ribbons, but also wool and clothes. And, as long as the dye is fresh, the colour is far more beautiful than the purple dye; it occurs on the north coast in greater abundance and fairer, as do the sponges and other such things.

[3] There is another kind like dog's-tooth grass; the leaf is very like, the root is jointed and long, and grows out sideways, like that of that plant; it has also a reedy stalk like the same plant, and in size it is much smaller than ordinary seaweed.

[4] Another kind is the oyster-green, which has a leaf green in colour, but broad and not unlike lettuce leaves; but it is more wrinkled [5] and as it were crumpled. It has no stalk, but from a single starting-point grow many of the kind, and again from another starting-point. These things grow on stones close to land and on oyster-shells. These are about all the smaller kinds.

[6] The 'sea-oak' and 'sea-fir' both belong to the shore; they grow on stones and oyster-shells, having no roots, but being attached to them like limpets.[7] Both have more or less fleshy leaves; but the leaf of the 'fir' grows much longer and stouter, and is [8]

[4] Plin. 13. 137; 27. 56; *βρύον* conj. Scal. from G and Plin. *l. c.*; *βότρυον* UAld.H.

[5] *ῥυτιδωδέστερον* conj. Scal. from G and Plin. *l.c.*; *χρυσιωδέστερον* Ald.; *ῥυσιωδέστερον* mBas.

[6] Plin. *l.c.* [7] *λεπάδες* Ald.; *λοπάδες* W. with UMV.

[8] *προμηκέστερον . . . πέφυκε καὶ* conj W.; *προμ. δὲ τὸ φύλλον ταχὺ καὶ παχύτερον τῆς ἐλάτης· πολὺ δὲ καὶ* Ald.

πέφυκε καὶ οὐκ ἀνόμοιον τοῖς τῶν ὀσπρίων λοβοῖς, κοῖλον δ' ἔνδοθεν καὶ οὐδὲν ἔχον ἐν αὐτοῖς· τὸ δὲ τῆς δρυὸς λεπτὸν καὶ μυρικωδέστερον· χρῶμα δ' ἐπιπόρφυρον ἀμφοῖν. ἡ δὲ ὅλη μορφὴ τῆς μὲν ἐλάτης ὀρθὴ καὶ αὐτῆς καὶ τῶν ἀκρεμόνων, τῆς δὲ δρυὸς σκολιωτέρα καὶ μᾶλλον ἔχουσα πλάτος·
8 γίνεται δὲ ἄμφω καὶ πολύκαυλα καὶ <μονόκαυλα,> μονοκαυλότερον δὲ ἡ ἐλάτη· τὰς δὲ ἀκρεμονικὰς ἀποφύσεις ἡ μὲν ἐλάτη μακρὰς ἔχει καὶ εὐθείας καὶ μανάς, ἡ δὲ δρῦς βραχυτέρας καὶ σκολιωτέρας καὶ πυκνοτέρας. τὸ δ' ὅλον μέγεθος ἀμφοτέρων ὡς πυγωνιαῖον ἢ μικρὸν ὑπεραῖρον, μεῖζον δὲ ὡς ἁπλῶς εἰπεῖν τὸ τῆς ἐλάτης. χρήσιμον δὲ ἡ δρῦς εἰς βαφὴν ἐρίων ταῖς γυναιξίν. ἐπὶ μὲν τῶν ἀκρεμόνων προσηρτημένα τῶν ὀστρακοδέρμων ζώων ἔνια· καὶ κάτω δὲ πρὸς αὐτῷ τῷ καυλῷ περιπεφυκότων τινῶν γ' ὅλῳ, ἐν τούτοις δεδυκότες ὀνίννοι τε καὶ ἄλλ' ἄττα καὶ τὸ ὅμοιον πολύποδι.
9 Ταῦτα μὲν οὖν πρόσγεια καὶ ῥᾴδια θεωρηθῆναι· φασὶ δέ τινες καὶ ἄλλην δρῦν εἶναι ποντίαν ἣ καὶ καρπὸν φέρει, καὶ ἡ βάλανος αὐτῆς χρησίμη· τοὺς δὲ σκινθοὺς καὶ κολυμβητὰς λέγειν ὅτι καὶ ἕτεραι μεγάλαι τινὲς τοῖς μεγέθεσιν εἴησαν.

Ἡ δὲ ἄμπελος ἀμφοτέρωσε γίνεται· καὶ γὰρ πρὸς τῇ γῇ καὶ ποντία· μείζω δ' ἔχει καὶ τὰ φύλλα καὶ τὰ κλήματα καὶ τὸν καρπὸν ἡ ποντία.

Ἡ δὲ συκῆ ἄφυλλος μὲν τῷ δὲ μεγέθει οὐ μεγάλη, χρῶμα δὲ τοῦ φλοιοῦ φοινικοῦν.

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[1] αὐτοῖς Ald.H.; αὐτῷ conj. W.
[2] I have inserted μονόκαυλα.

not unlike the pods of pulses, but is hollow inside and contains nothing in the 'pods.'[1] That of the 'oak' is slender and more like the tamarisk; the colour of both is purplish. The whole shape of the 'fir' is erect, both as to the stem and the branches, but that of the 'oak' is less straight and the plant is broader. Both are found both with many stems and with one,[2] but the 'fir' is more apt to have a single stem. The branchlike outgrowths in the 'fir' are long straight and spreading, while in the 'oak' they are shorter less straight and closer. The whole size of either is about a cubit or rather more, but in general that of the 'fir' is the longer. The 'oak' is useful to women for dyeing wool. To the branches are attached certain creatures with shells, and below they are also found attached to the stem itself, which in some cases they completely cover;[3] and among these are found millepedes and other such creatures, including the one which resembles a cuttlefish.

These plants occur close to land and are easy to observe; but some report[4] that there is another 'sea oak' which even bears fruit and has a useful 'acorn,' and that the sponge fishers[5] and divers told them that there were other large kinds.

[6]The 'sea-vine' grows under both conditions, both close to land and in the deep sea; but the deep sea form has larger leaves branches and fruit.

[7]The 'sea-fig' is leafless and not of large size, and the colour of the bark is red.

[3] *τινῶν γ' ὅλῳ* conj. W.; *τινῶν ὅλων* Ald.; *τινῶν γε ὅλων* U; text uncertain: the next clause has no connecting particle.

[4] Plin. 13. 137.

[5] *σκίνθους*, a *vox nihili*: perhaps conceals a proper name, *e.g.* *Σικελικοὺς*; *σπογγεῖς* conj. St.

[6] Plin. 13. 138. [7] Plin. *l.c.*

10 Ὁ δὲ φοινίξ ἐστι μὲν πόντιον βραχυστέλεχες δὲ σφόδρα, καὶ σχεδὸν εὐθεῖαι αἱ ἐκφύσεις τῶν ῥάβδων· καὶ κάτωθεν οὐ κύκλῳ αὗται, καθάπερ τῶν ῥάβδων αἱ ἀκρεμόνες, ἀλλ' ὡσὰν ἐν πλάτει κατὰ μίαν συνεχεῖς, ὀλιγαχοῦ δὲ καὶ ἀπαλλάττουσαι. τῶν δὲ ῥάβδων ἡ τῶν ἀποφύσεων τούτων ὁμοία τρόπον τινὰ ἡ φύσις τοῖς τῶν ἀκανθῶν φύλλοις τῶν ἀκανικῶν, οἷον σόγκοις καὶ τοῖς τοιούτοις, πλὴν ὀρθαὶ καὶ οὐχ, ὥσπερ ἐκεῖνα, περικεκλασμέναι καὶ τὸ φύλλον ἔχουσαι διαβεβρωμένον ὑπὸ τῆς ἅλμης· ἐπεὶ τό γε δι' ὅλου ἥκειν τὸν μέσον γε καυλὸν καὶ ἡ ἄλλη ὄψις παραπλησία. τὸ δὲ χρῶμα καὶ τούτων καὶ τῶν καυλῶν καὶ ὅλου τοῦ φυτοῦ ἐξέρυθρόν τε σφόδρα καὶ φοινικοῦν.

Καὶ τὰ μὲν ἐν τῇδε τῇ θαλάττῃ τοσαῦτά ἐστιν. ἡ γὰρ σπογγιὰ καὶ αἱ ἀπλυσίαι καλούμεναι καὶ εἴ τι τοιοῦτον ἑτέραν ἔχει φύσιν.

VII. Ἐν δὲ τῇ ἔξω τῇ περὶ Ἡρακλέους στήλας τό τε πράσον, ὥσπερ εἴρηται, φύεται καὶ τὰ ἀπολιθούμενα ταῦτα, οἷον θῦμα καὶ τὰ δαφνοειδῆ καὶ τὰ ἄλλα. τῆς δὲ ἐρυθρᾶς καλουμένης ἐν τῇ Ἀραβίᾳ μικρὸν ἐπάνω Κόπτου ἐν μὲν τῇ γῇ

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[1] *κάτωθεν . . , ἀπαλλάττουσαι* probably beyond certain restoration : I have added *καὶ* before *κάτωθεν* (from G), altered *κυκλωθὲν* to *κύκλῳ*, put a stop before *καὶ κάτωθεν*, and restored *ἀπαλλάττουσαι* (Ald.H.). [2] *cf.* 6. 4. 8 ; 7. 8. 3.

[3] *περικεκλασμένα*, *i.e.* towards the ground. *cf.* Diosc. 3. 68 and 69, where Plin. (27. 13) renders (*φύλλα*) *ὑποπερικλᾶται ad terram infracta.*

The 'sea-palm' is a deep-sea plant, but with a very short stem, and the branches which spring from it are almost straight; and these under water are not set all round the stem, like the twigs which grow from the branches, but extend, as it were, quite flat in one direction, and are uniform; though occasionally they are irregular.[1] The character of these branches or outgrowths to some extent resembles the leaves of thistle-like spinous plants, such as the sow-thistles[2] and the like, except that they are straight and not bent over[3] like these, and have their leaves eaten away by the brine; in the fact that the central stalk[4] at least runs through the whole, they resemble these, and so does the general appearance. The colour both of the branches and of the stalks and of the plant as a whole is a deep red or scarlet.

Such are the plants found in this sea. For sponges and what are called *aplysiai*[5] and such-like growths are of a different character.

Of the aquatic plants of the 'outer sea' (i.e. *Atlantic, Persian Gulf, etc.*).

VII. In the outer sea near the pillars of Heracles grows the 'sea-leek,' as has been said[6]; also the well known[7] plants which turn to stone, as *thyma*, the plants like the bay and others. And in the sea called the Red Sea[8] a little above Coptos[9]

[1] *i.e.* midrib.

[2] Some kind of sponge. ἀπλυσίαι conj. R. Const.; πλύσιαι UAld.; πλυσίαι M; πλουσίαι V. [6] 4. 6. 4.

[7] ταῦτα: *cf.* 3. 7. 3; 3. 18. 11.

[8] Plin. 13. 139.

[9] Κόπτου conj. Scal.; κόπου MV; κόλπου UAld.; *Capto* G and Plin. *l.c.*

δένδρον οὐδὲν φύεται πλὴν τῆς ἀκάνθης τῆς διψάδος καλουμένης· σπανία δὲ καὶ αὕτη διὰ τὰ καύματα καὶ τὴν ἀνυδρίαν· οὐχ ὕει γὰρ ἀλλ' ἢ δι' ἐτῶν τεττάρων ἢ πέντε καὶ τότε λάβρως καὶ ἐπ' ὀλίγον χρόνον.

2 Ἐν δὲ τῇ θαλάττῃ φύεται, καλοῦσι δ' αὐτὰ δάφνην καὶ ἐλάαν. ἔστι δὲ ἡ μὲν δάφνη ὁμοία τῇ ἀρίᾳ ἡ δὲ ἐλάα <τῇ ἐλάᾳ> τῷ φύλλῳ· καρπὸν δὲ ἔχει ἡ ἐλάα παραπλήσιον ταῖς ἐλάαις· ἀφίησι δὲ καὶ δάκρυον, ἐξ οὗ οἱ ἰατροὶ φάρμακον ἔναιμον συντιθέασιν ὃ γίνεται σφόδρα ἀγαθόν. ὅταν δὲ ὕδατα πλείω γένηται, μύκητες φύονται πρὸς τῇ θαλάττῃ κατά τινα τόπον, οὗτοι δὲ ἀπολιθοῦνται ὑπὸ τοῦ ἡλίου. ἡ δὲ θάλαττα θηριώδης· πλείστους δὲ ἔχει τοὺς καρχαρίας, ὥστε μὴ εἶναι κολυμβῆσαι.

Ἐν δὲ τῷ κόλπῳ τῷ καλουμένῳ Ἡρώων, ἐφ' ὃν καταβαίνουσιν οἱ ἐξ Αἰγύπτου, φύεται μὲν δάφνη τε καὶ ἐλάα καὶ θύμον, οὐ μὴν χλωρά γε ἀλλὰ λιθοειδῆ τὰ ὑπερέχοντα τῆς θαλάττης, ὅμοια δὲ καὶ τοῖς φύλλοις καὶ τοῖς βλαστοῖς τοῖς χλωροῖς. ἐν δὲ τῷ θύμῳ καὶ τὸ τοῦ ἄνθους χρῶμα διάδηλον ὡσὰν μήπω τελέως ἐξηνθηκός. μήκη δὲ τῶν δενδρυφίων ὅσον εἰς τρεῖς πήχεις.

3 Οἱ δέ, ὅτε ἀνάπλους ἦν τῶν ἐξ Ἰνδῶν ἀποσταλέντων ὑπὸ Ἀλεξάνδρου, τὰ ἐν τῇ θαλάττῃ φυόμενα, μέχρι οὗ μὲν ἂν ᾖ ἐν τῷ ὑγρῷ, χρῶμά φασιν ἔχειν ὅμοιον τοῖς φυκίοις, ὁπόταν δ' ἐξ-

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[1] *cf.* Strabo 16. 1. 147. [2] See Index.

[3] The name of a tree seems to have dropped out: I have inserted *τῇ ἐλάᾳ*: *cf.* *ταῖς ἐλάαις* below. Bretzl suggests *ἰδέᾳ* for *ἀρίᾳ*.

in Arabia there grows on the land no tree except that called the 'thirsty' acacia, and even this is scarce by reason of the heat and the lack of water; for it never rains except at intervals of four or five years, and then the rain comes down heavily and is soon over.

[1] But there are plants in the sea, which they call 'bay' and 'olive' (white mangrove[2]). In foliage the 'bay' is like the *aria* (holm-oak), the 'olive' like the real olive.[3] The latter has a fruit like olives, and it also discharges a gum,[4] from which the physicians[4] compound a drug[5] for stanching blood, which is extremely effective. And when there is more rain than usual, mushrooms grow in a certain place close to the sea, which are turned to stone by the sun. The sea is full of beasts, and produces sharks[6] in great numbers, so that diving is impossible.

In the gulf called 'the Gulf of the Heroes,'[7] to which the Egyptians go down, there grow a 'bay,' an 'olive,' and a 'thyme'; these however are not green, but like stones so far as they project above the sea, but in leaves and shoots they are like their green namesakes. In the 'thyme' the colour of the flower is also conspicuous, looking as though the flower had not yet completely developed. These treelike growths are about three cubits in height.

[8] Now some, referring to the occasion when there was an expedition of those returning from India sent out by Alexander, report that the plants which grow in the sea, so long as they are kept damp, have a colour

[4] *cf.* Diosc. 1. 105 and 106.
[5] *cf.* Athen. 4. 83; Plin. 12. 77.
[6] Plin. 13. 139. [7] *cf.* 9. 4. 4. [8] Plin. 13. 140.

ενεχθέντα τεθῇ πρὸς τὸν ἥλιον, ἐν ὀλίγῳ χρόνῳ ἐξομοιοῦσθαι τῷ ἁλί. φύεσθαι δὲ καὶ σχοίνους λιθίνους παρ' αὐτὴν τὴν θάλατταν, οὓς οὐδεὶς ἂν διαγνοίη τῇ ὄψει πρὸς τοὺς ἀληθινούς. θαυμασιώτερον δέ τι τούτου λέγουσι· φύεσθαι γὰρ δενδρύφι' ἄττα τὸ μὲν χρῶμα ἔχοντα ὅμοιον κέρατι βοὸς τοῖς δὲ ὄζοις τραχέα καὶ ἀπ' ἄκρου πυρρά· ταῦτα δὲ θραύεσθαι μὲν εἰ συγκλῴη τις· ἐκ δὲ τούτων πυρὶ ἐμβαλλόμενα, καθάπερ τὸν σίδηρον, διάπυρα γινόμενα πάλιν ὅταν ἀποψύχοιτο καθίστασθαι καὶ τὴν αὐτὴν χρόαν λαμβάνειν.

4 Ἐν δὲ ταῖς νήσοις ταῖς ὑπὸ τῆς πλημμυρίδος καταλαμβανομέναις δένδρα μεγάλα πεφυκέναι ἡλίκαι πλάτανοι καὶ αἴγειροι αἱ μέγισται· συμβαίνειν δέ, ὅθ' ἡ πλημμυρὶς ἐπέλθοι, τὰ μὲν ἄλλα κατακρύπτεσθαι ὅλα, τῶν δὲ μεγίστων ὑπερέχειν τοὺς κλάδους, ἐξ ὧν τὰ πρυμνησία ἀνάπτειν, εἶθ' ὅτε πάλιν ἄμπωτις γίνοιτο ἐκ τῶν ῥιζῶν. ἔχειν δὲ τὸ δένδρον φύλλον μὲν ὅμοιον τῇ δάφνῃ, ἄνθος δὲ τοῖς ἴοις καὶ τῷ χρώματι καὶ τῇ ὀσμῇ, καρπὸν δὲ ἡλίκον ἐλάα καὶ τοῦτον εὐώδη σφόδρα· καὶ τὰ μὲν φύλλα οὐκ ἀποβάλλειν, τὸ δὲ ἄνθος καὶ τὸν καρπὸν ἅμα τῷ φθινοπώρῳ γίνεσθαι, τοῦ δὲ ἔαρος ἀπορρεῖν.

5 Ἄλλα δ' ἐν αὐτῇ τῇ θαλάττῃ πεφυκέναι, ἀείφυλλα μὲν τὸν δὲ καρπὸν ὅμοιον ἔχειν τοῖς θέρμοις.

Περὶ δὲ τὴν Περσίδα τὴν κατὰ τὴν Καρμανίαν, καθ' ὃ ἡ πλημμυρὶς γίνεται, δένδρα ἐστὶν εὐμεγέθη ὅμοια τῇ ἀνδράχλῃ καὶ τῇ μορφῇ καὶ τοῖς φύλλοις· καρπὸν δὲ ἔχει πολὺν ὅμοιον τῷ χρώματι ταῖς

like sea-weeds, but that when they are taken out and put in the sun, they shortly become like salt. They also say that rushes of stone grow close to the sea, which none could distinguish at sight from real rushes. They also report a more marvellous thing than this; they say that there are certain tree-like growths which in colour resemble an ox-horn, but whose branches are rough, and red at the tip; these break if they are doubled up, and some of them, if they are cast on a fire, become red-hot like iron, but recover when they cool and assume their original colour.

[1] On the islands which get covered by the tide they say that great trees [2] grow, as big as planes or the tallest poplars, and that it came to pass that, when the tide [3] came up, while the other things were entirely buried, the branches of the biggest trees projected and they fastened the stern cables to them, and then, when the tide ebbed again, fastened them to the roots. And that the tree has a leaf like that of the bay, and a flower like gilliflowers in colour and smell, and a fruit the size of that of the olive, which is also very fragrant. And that it does not shed its leaves, and that the flower and the fruit form together in autumn and are shed in spring.

[4] Also they say there are plants which actually grow in the sea, which are evergreen and have a fruit like lupins.

[5] In Persia in the Carmanian district, where the tide is felt, there are trees [6] of fair size like the andrachne in shape and in leaves; and they bear much fruit like

[1] Plin. 13. 141.
[2] Mangroves. See Index App. (12).
[3] *cf.* Arr. *Anab.* 6. 22. 6.
[4] Plin. *l.c.* Index App. (13). [5] Plin. 12. 37.
[6] White mangroves. Index App. (14).

ἀμυγδάλαις ἔξωθεν, τὸ δ' ἐντὸς συνελίττεται καθάπερ συνηρτημένον πᾶσιν. ὑποβέβρωται δὲ ταῦτα τὰ δένδρα πάντα κατὰ μέσον ὑπὸ τῆς θαλάττης καὶ ἕστηκεν ὑπὸ τῶν ῥιζῶν, ὥσπερ πολύπους. ὅταν γὰρ ἡ ἄμπωτις γένηται θεωρεῖν
6 ἐστιν. ὕδωρ δὲ ὅλως οὐκ ἔστιν ἐν τῷ τόπῳ· καταλείπονται δέ τινες διώρυχες δι' ὧν διαπλέουσιν· αὗται δ' εἰσὶ θαλάττης· ᾧ καὶ δῆλον οἵονταί τινες ὅτι τρέφονται ταύτῃ καὶ οὐ τῷ ὕδατι, πλὴν εἴ τι ταῖς ῥίζαις ἐκ τῆς γῆς ἕλκουσιν. εὔλογον δὲ καὶ τοῦθ' ἁλμυρὸν εἶναι· καὶ γὰρ οὐδὲ κατὰ βάθους αἱ ῥίζαι. τὸ δὲ ὅλον ἓν τὸ γένος εἶναι τῶν τ' ἐν τῇ θαλάττῃ φυομένων καὶ τῶν ἐν τῇ γῇ ὑπὸ τῆς πλημμυρίδος καταλαμβανομένων· καὶ τὰ μὲν ἐν τῇ θαλάττῃ μικρὰ καὶ φυκώδη φαινόμενα, τὰ δ' ἐν τῇ γῇ μεγάλα καὶ χλωρὰ καὶ ἄνθος εὔοδμον ἔχοντα, καρπὸν δὲ οἷον θέρμος.

7 Ἐν Τύλῳ δὲ τῇ νήσῳ, κεῖται δ' αὕτη ἐν τῷ Ἀραβίῳ κόλπῳ, τὰ μὲν πρὸς ἕω τοσοῦτο πλῆθος εἶναί φασι δένδρων ὅτ' ἐκβαίνει ἡ πλημμυρὶς ὥστ' ἀπωχυρῶσθαι. πάντα δὲ ταῦτα μεγέθη μὲν ἔχειν ἡλίκα συκῆ, τὸ δὲ ἄνθος ὑπερβάλλον τῇ εὐωδίᾳ, καρπὸν δὲ ἄβρωτον ὅμοιον τῇ ὄψει τῷ θέρμῳ. φέρειν δὲ τὴν νῆσον καὶ τὰ δένδρα τὰ ἐριοφόρα πολλά. ταῦτα δὲ φύλλον μὲν ἔχειν παρόμοιον τῇ ἀμπέλῳ πλὴν μικρόν, καρπὸν δὲ οὐδένα φέρειν· ἐν ᾧ δὲ τὸ ἔριον ἡλίκον μῆλον ἐαρινὸν συμμεμυκός· ὅταν δὲ ὡραῖον ᾖ, ἐκπετάν-

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[1] Plin. *l.c.* *Sicco litore radicibus nudis polyporum modo complexae steriles arenas expectantur*: he appears to have had a fuller text.

in colour to almonds on the outside, but the inside is coiled up as though the kernels were all united. [1] These trees are all eaten away up to the middle by the sea and are held up by their roots, so that they look like a cuttle-fish. For one may see this at ebb-tide. And there is no rain at all in the district, but certain channels are left, along which they sail, and which are part of the sea. Which, some think, makes it plain that the trees derive nourishment from the sea and not from fresh water, except what they draw up with their roots from the land. And it is reasonable to suppose that this too is brackish; for the roots do not run to any depth. In general they say that the trees which grow in the sea and those which grow on the land and are overtaken by the tide are of the same kind, and that those which grow in the sea are small and look like seaweed, while those that grow [2] on land are large and green and have a fragrant flower and a fruit like a lupin.

In the island of Tylos,[3] which is situated in the Arabian gulf,[4] they say that on the east side there is such a number of trees when the tide goes out that they make a regular fence. All these are in size as large as a fig-tree, the flower is exceedingly fragrant, and the fruit, which is not edible, is like in appearance to the lupin. They say that the island also produces the 'wool-bearing' tree (cotton-plant) in abundance. This has a leaf like that of the vine, but small, and bears no fruit; but the vessel in which the 'wool' is contained is as large as a spring apple,

[2] *φυκώδη φαινόμενα τὰ δ' ἐν* conj. W.; *φυκ. φυ. δ' ἐν* MVAld.; U has *φερόμενα* (?).

[3] *cf.* 5. 4. 6; Plin. 12. 38 and 39; modern name Bahrein.

[4] *i.e.* Persian Gulf.

νυσθαι καὶ ἐξείρειν τὸ ἔριον, ἐξ οὗ τὰς σινδόνας ὑφαίνουσι, τὰς μὲν εὐτελεῖς τὰς δὲ πολυτελεστάτας.

8 Γίνεται δὲ τοῦτο καὶ ἐν Ἰνδοῖς, ὥσπερ ἐλέχθη, καὶ ἐν Ἀραβίᾳ. εἶναι δὲ ἄλλα δένδρα τὸ ἄνθος ἔχοντα ὅμοιον τῷ λευκοΐῳ, πλὴν ἄοδμον καὶ τῷ μεγέθει τετραπλάσιον τῶν ἴων. καὶ ἕτερον δέ τι δένδρον πολύφυλλον ὥσπερ τὸ ῥόδον· τοῦτο δὲ τὴν μὲν νύκτα συμμύειν ἅμα δὲ τῷ ἡλίῳ ἀνιόντι διοίγνυσθαι, μεσημβρίας δὲ τελέως διεπτύχθαι, πάλιν δὲ τῆς δείλης συνάγεσθαι κατὰ μικρὸν καὶ τὴν νύκτα συμμύειν· λέγειν δὲ καὶ τοὺς ἐγχωρίους ὅτι καθεύδει. γίνεσθαι δὲ καὶ φοίνικας ἐν τῇ νήσῳ καὶ ἀμπέλους καὶ τἆλλα ἀκρόδρυα καὶ συκᾶς οὐ φυλλορροούσας. ὕδωρ δὲ οὐράνιον γίνεσθαι μέν, οὐ μὴν χρῆσθαί γε πρὸς τοὺς καρπούς· ἀλλ' εἶναι κρήνας ἐν τῇ νήσῳ πολλάς, ἀφ' ὧν πάντα βρέχειν, ὃ καὶ συμφέρειν μᾶλλον τῷ σίτῳ καὶ τοῖς δένδρεσιν. δι' ὃ καὶ ὅταν ὗσῃ τοῦτο ἐπαφιέναι καθαπερεὶ καταπλύνοντας ἐκεῖνο. καὶ τὰ μὲν ἐν τῇ ἔξω θαλάττῃ δένδρα τά γε νῦν τεθεωρημένα σχεδὸν τοσαῦτά ἐστιν.

VIII. Ὑπὲρ δὲ τῶν ἐν τοῖς ποταμοῖς καὶ τοῖς ἕλεσι καὶ ταῖς λίμναις μετὰ ταῦτα λεκτέον. τρία δέ ἐστιν εἴδη τῶν ἐν τούτοις, τὰ μὲν δένδρα τὰ δ'

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[1] ἐξείρειν conj. W.; ἐξειαίρειν P_2; ἐξαίρειν Ald. [2] 4. 5. 8.
[3] Tamarind. See Index App. (15). Plin. 12. 40.
[4] πλὴν ἄοδμον conj. H. Steph.; πλείονα ὄδμον UMAld.
[5] τῷ μεγέθει καὶ I conj.; καὶ τῷ μεγέθει UMVP; καὶ om. Ald.
[6] Tamarind also. See Index App. (16). [7] *i.e.* leaflets.
[8] *Ficus laccifera.* See Index App. (17). οὐ φυλλορροούσας conj. W., *cf.* G and Plin. *l.c.*; αἱ φυλλορροοῦσιν Ald.H.

and closed, but when it is ripe, it unfolds and puts forth[1] the 'wool,' of which they weave their fabrics, some of which are cheap and some very expensive.

This tree is also found, as was said,[2] in India as well as in Arabia. They say that there are other trees[3] with a flower like the gilliflower, but scentless[4] and in size[5] four times as large as that flower. And that there is another tree[6] with many leaves[7] like the rose, and that this closes at night, but opens at sunrise, and by noon is completely unfolded; and at evening again it closes by degrees and remains shut at night, and the natives say that it goes to sleep. Also that there are date-palms on the island and vines and other fruit-trees, including evergreen[8] figs. Also that there is water from heaven, but that they do not use it for the fruits, but that there are many springs on the island, from which they water everything, and that this is more beneficial[9] to the corn and the trees. Wherefore, even when it rains, they let this water over the fields,[10] as though they were washing away the rain water. Such are the trees as so far observed which grow in the outer sea.

Of the plants of rivers, marshes, and lakes, especially in Egypt.

VIII. Next we must speak of plants which live in rivers marshes and lakes. Of these there are three classes, trees, plants of 'herbaceous'[11] character, and

[9] ὃ καὶ συμφέρειν conj. Sch.; ἃ καὶ συμφέρει Ald.; U has συμφέρειν.

[10] *cf. C.P.* 2. 5. 5, where Androsthenes, one of Alexander's admirals, is given as the authority for this statement.

[11] The term τὰ ποιώδη seems to be given here a narrower connotation than usual, in order that τὰ λοχμώδη may be distinguished.

ὥσπερ ποιώδη τὰ δὲ λοχμώδη. λέγω δὲ ποιώδη μὲν οἷον τὸ σέλινον τὸ ἕλειον καὶ ὅσα ἄλλα τοιαῦτα· λοχμώδη δὲ κάλαμον κύπειρον φλεὼ σχοῖνον βούτομον, ἅπερ σχεδὸν κοινὰ πάντων τῶν ποταμῶν καὶ τῶν τοιούτων τόπων.

Ἐνιαχοῦ δὲ καὶ βάτοι καὶ παλίουροι καὶ τὰ ἄλλα δένδρα, καθάπερ ἰτέα λεύκη πλάτανος. τὰ μὲν οὖν μέχρι τοῦ κατακρύπτεσθαι, τὰ δὲ ὥστε μικρὸν ὑπερέχειν, τῶν δὲ αἱ μὲν ῥίζαι καὶ μικρὸν τοῦ στελέχους ἐν τῷ ὑγρῷ, τὸ δὲ ἄλλο σῶμα πᾶν ἔξω. τοῦτο γὰρ καὶ ἰτέᾳ καὶ κλήθρᾳ καὶ πλατάνῳ καὶ φιλύρᾳ καὶ πᾶσι τοῖς φιλύδροις συμβαίνει.

2 Σχεδὸν δὲ καὶ ταῦτα κοινὰ πάντων τῶν ποταμῶν ἐστιν· ἐπεὶ καὶ ἐν τῷ Νείλῳ πέφυκεν· οὐ μὴν πολλή γε ἡ πλάτανος, ἀλλὰ σπανιωτέρα ἔτι ταύτης ἡ λεύκη, πλείστη δὲ μελία καὶ βουμέλιος. τῶν γοῦν ἐν Λιγύπτῳ φυομένων τὸ μὲν ὅλον πολὺ πλῆθός ἐστιν πρὸς τὸ ἀριθμήσασθαι καθ' ἕκαστον· οὐ μὴν ἀλλ' ὥς γε ἁπλῶς εἰπεῖν ἅπαντα ἐδώδιμα καὶ χυλοὺς ἔχοντα γλυκεῖς. διαφέρειν δὲ δοκεῖ τῇ γλυκύτητι καὶ τῷ τρόφιμα μάλιστα εἶναι τρία ταῦτα, ὅ τε πάπυρος καὶ τὸ καλούμενον σάρι καὶ τρίτον ὃ μνάσιον καλοῦσι.

3 Φύεται δὲ ὁ πάπυρος οὐκ ἐν βάθει τοῦ ὕδατος ἀλλ' ὅσον ἐν δύο πήχεσιν, ἐνιαχοῦ δὲ καὶ ἐν ἐλάττονι. πάχος μὲν οὖν τῆς ῥίζης ἡλίκον καρπὸς χειρὸς ἀνδρὸς εὐρώστου, μῆκος δὲ ὑπὲρ τετράπηχυ· φύεται δὲ ὑπὲρ τῆς γῆς αὐτῆς, πλαγίας ῥίζας εἰς τὸν πηλὸν καθιεῖσα λεπτὰς καὶ πυκνάς, ἄνω δὲ τοὺς παπύρους καλουμένους τριγώνους,

[1] τῶν γοῦν κ.τ.λ.: text probably defective; what follows appears to relate to τὰ ποιώδη.

plants growing in clumps. By 'herbaceous' I mean here such plants as the marsh celery and the like; by 'plants growing in clumps' I mean reeds galingale *phleo* rush sedge—which are common to almost all rivers and such situations.

And in some such places are found brambles Christ's thorn and other trees, such as willow abele plane. Some of these are water plants to the extent of being submerged, while some project a little from the water; of some again the roots and a small part of the stem are under water, but the rest of the body is altogether above it. This is the case with willow alder plane lime, and all water-loving trees.

These too are common to almost all rivers, for they grow even in the Nile. However the plane is not abundant by rivers, while the abele is even more scarce, and the manna-ash and ash are commonest. At any rate of those[1] that grow in Egypt the list is too long to enumerate separately; however, to speak generally, they are all edible and have sweet flavours. But they differ in sweetness, and we may distinguish also three as the most useful for food, namely the papyrus, the plant called *sari*, and the plant which they call *mnasion*.

[2]The papyrus does not grow in deep water, but only in a depth of about two cubits, and sometimes shallower. The thickness of the root is that of the wrist of a stalwart man, and the length above four cubits[3]; it grows above the ground itself, throwing down slender matted roots into the mud, and producing above the stalks which give it its name 'papyrus'; these are three-cornered and about ten

[2] Plin. 13. 71–73.

[3] τετράπηχυ: δέκα πήχεις MSS. See next note.

μέγεθος ὡς δέκα πήχεις, κόμην ἔχοντας ἀχρεῖον ἀσθενῆ καρπὸν δὲ ὅλως οὐδένα· τούτους δ' ἀναδί-
4 δωσι κατὰ πολλὰ μέρη. χρῶνται δὲ ταῖς μὲν ῥίζαις ἀντὶ ξύλων οὐ μόνον τῷ κάειν ἀλλὰ καὶ τῷ σκεύη ἄλλα ποιεῖν ἐξ αὐτῶν παντοδαπά· πολὺ γὰρ ἔχει τὸ ξύλον καὶ καλόν. αὐτὸς δὲ ὁ πάπυρος πρὸς πλεῖστα χρήσιμος· καὶ γὰρ πλοῖα ποιοῦσιν ἐξ αὐτοῦ, καὶ ἐκ τῆς βίβλου ἱστία τε πλέκουσι καὶ ψιάθους καὶ ἐσθῆτά τινα καὶ στρωμνὰς καὶ σχοινία τε καὶ ἕτερα πλείω. καὶ ἐμφανέστατα δὴ τοῖς ἔξω τὰ βιβλία· μάλιστα δὲ καὶ πλείστη βοήθεια πρὸς τὴν τροφὴν ἀπ' αὐτοῦ γίνεται. μασῶνται γὰρ ἅπαντες οἱ ἐν τῇ χώρᾳ τὸν πάπυρον καὶ ὠμὸν καὶ ἑφθὸν καὶ ὀπτόν· καὶ τὸν μὲν χυλὸν καταπίνουσι, τὸ δὲ μάσημα ἐκβάλλουσιν. ὁ μὲν οὖν πάπυρος τοιοῦτός τε καὶ ταύτας παρέχεται τὰς χρείας. γίνεται δὲ καὶ ἐν Συρίᾳ περὶ τὴν λίμνην ἐν ᾗ καὶ ὁ κάλαμος ὁ εὐώδης· ὅθεν καὶ Ἀντίγονος εἰς τὰς ναῦς ἐποιεῖτο τὰ σχοινία.

5 Τὸ δὲ σάρι φύεται μὲν ἐν τῷ ὕδατι περὶ τὰ ἕλη καὶ τὰ πεδία, ἐπειδὰν ὁ ποταμὸς ἀπέλθῃ, ῥίζαν δὲ ἔχει σκληρὰν καὶ συνεστραμμένην, καὶ ἐξ αὐτῆς φύεται τὰ σαρία καλούμενα· ταῦτα δὲ μῆκος μὲν ὡς δύο πήχεις, πάχος δὲ ἡλίκον ὁ δάκτυλος ὁ μέγας τῆς χειρός· τρίγωνον δὲ καὶ τοῦτο, καθάπερ ὁ πάπυρος, καὶ κόμην ἔχον παραπλήσιον. μασώμενοι δὲ ἐκβάλλουσι καὶ τοῦτο τὸ μάσημα, τῇ ῥίζῃ δὲ οἱ σιδηρουργοὶ χρῶνται· τὸν γὰρ ἄνθρακα ποιεῖ χρηστὸν διὰ τὸ σκληρὸν εἶναι τὸ ξύλον.

6 Τὸ δὲ μνάσιον ποιῶδές ἐστιν, ὥστ' οὐδεμίαν παρέχεται χρείαν πλὴν τὴν εἰς τροφήν.

cubits[1] long, having a plume which is useless and weak, and no fruit whatever; and these stalks the plant sends up at many points. They use the roots instead of wood, not only for burning, but also for making a great variety of articles; for the wood is abundant and good. The 'papyrus' itself[2] is useful for many purposes; for they make boats from it, and from the rind they weave sails mats a kind of raiment coverlets ropes and many other things. Most familiar to foreigners are the papyrus-rolls made of it; but above all the plant also is of very great use in the way of food.[3] For all the natives chew the papyrus both raw boiled and roasted; they swallow the juice and spit out the quid. Such is the papyrus and such its uses. It grows also in Syria about the lake in which grows also sweet-flag; and Antigonus made of it the cables for his ships.

[4] The *sari* grows in the water in marshes and plains, when the river has left them; it has a hard twisted root, and from it grow what they call the *saria*[5]; these are about two cubits long and as thick as a man's thumb; this stalk too is three-cornered, like the papyrus, and has similar foliage. This also they chew, spitting out the quid; and smiths use the root, for it makes excellent charcoal, because the wood is hard.

Mnasion is herbaceous, so that it has no use except for food.

[1] δέκα πήχεις: τετραπήχεις MSS. The two numbers seem to have changed places (Bartels ap. Sch.). *cf.* Plin. *l.c.*
[2] *i.e.* the stalk.
[3] *cf.* Diod. 1. 80. [4] Plin. 13. 128.
[5] *i.e.* stalks, like those of the papyrus.

Καὶ τὰ μὲν γλυκύτητι διαφέροντα ταῦτά ἐστι. φύεται δὲ καὶ ἕτερον ἐν τοῖς ἕλεσι καὶ ταῖς λίμναις ὃ οὐ συνάπτει τῇ γῇ, τὴν μὲν φύσιν ὅμοιον τοῖς κρίνοις, πολυφυλλότερον δὲ καὶ παρ' ἄλληλα τὰ φύλλα καθάπερ ἐν διστοιχίᾳ· χρῶμα δὲ χλωρὸν ἔχει σφόδρα. χρῶνται δὲ οἱ ἰατροὶ πρός τε τὰ γυναικεῖα αὐτῷ καὶ πρὸς τὰ κατάγματα.

7 [Ταῦτα δὲ γίνεται ἐν τῷ ποταμῷ εἰ μὴ ὁ ῥοῦς ἐξέφερεν· συμβαίνει δὲ ὥστε καὶ ἀποφέρεσθαι· ἕτερα δ' ἀπ' αὐτῶν πλείω.]

Ὁ δὲ κύαμος φύεται μὲν ἐν τοῖς ἕλεσι καὶ λίμναις, καυλὸς δὲ αὐτοῦ μῆκος μὲν ὁ μακρότατος εἰς τέτταρας πήχεις, πάχος δὲ δακτυλιαῖος, ὅμοιος δὲ καλάμῳ μαλακῷ ἀγονάτῳ. διαφύσεις δὲ ἔνδοθεν ἔχει δι' ὅλου διειλημμένας ὁμοίας τοῖς κηρίοις· ἐπὶ τούτῳ δὲ ἡ κωδύα, παρομοία σφηκίῳ περιφερεῖ, καὶ ἐν ἑκάστῳ τῶν κυττάρων κύαμος μικρὸν ὑπεραίρων αὐτῆς, πλῆθος δὲ οἱ πλεῖστοι τριάκοντα. τὸ δὲ ἄνθος διπλάσιον ἢ μήκωνος, χρῶμα δὲ ὅμοιον ῥόδῳ κατακορές· ἐπάνω δὲ τοῦ ὕδατος ἡ κωδύα. παραφύεται δὲ φύλλα μεγάλα παρ' ἕκαστον τῶν κυάμων, ὧν ἴσα τὰ μεγέθη πετάσῳ Θετταλικῇ τὸν αὐτὸν ἔχοντα καυλὸν τῷ τῶν κυάμων. συντρίψαντι δ' ἕκαστον τῶν κυάμων φανερόν ἐστι τὸ πικρὸν συνεστραμμένον, ἐξ

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[1] *Ottelia alismoeides.* See Index App. (18).

[2] ταῦτα . . . πλείω conj. W. after Sch.; I have also transposed the two sentences, after Sch. The whole passage in [ ] (which is omitted by G) is apparently either an interpolation or defective. σημαίνει δὲ ὥσπερ καὶ ἀποφέρεσθαι· ἕτερα δὲ ἀπ' αὐτῶν τὰ πλεῖα· ταῦτα δὲ γίνεται ἐν τῷ ποταμῷ· εἰ μὴ ὁ ῥοῦς ἐξέφερεν Ald.; so also U, but αὐτῶν πλείω.

Such are the plants which excel in sweetness of taste. There is also another plant[1] which grows in the marshes and lakes, but which does not take hold of the ground; in character it is like a lily, but it is more leafy, and has its leaves opposite to one another, as it were in a double row; the colour is a deep green. Physicians use it for the complaints of women and for fractures.

Now these plants grow in the river, unless the stream has thrown them up on land; it sometimes happens that they are borne down the stream, and that then other plants grow from them.[2]

[3] But the 'Egyptian bean' grows in the marshes and lakes; the length of its stalk at longest is four cubits, it is as thick as a man's finger, and resembles a pliant[4] reed without joints. Inside it has tubes which run distinct from one another right through, like a honey-comb: on this is set the 'head,' which is like a round wasps' nest, and in each of the cells is a 'bean,' which slightly projects from it; at most there are thirty of these. The flower is twice as large as a poppy's, and the colour is like a rose, of a deep shade; the 'head' is above the water. Large leaves grow at the side of each plant, equal[5] in size to a Thessalian hat[6]; these have a stalk exactly like that[7] of the plant. If one of the 'beans' is crushed, you find the bitter substance coiled up, of which the

[3] Plin. 18. 121 and 122.

[4] *μαλακῷ* Ald.H.G Plin. *l.c.* Athen. 3. 2 cites the passage with *μακρῷ*.

[5] *ἴσα* conj. W.; *καὶ* Ald.

[6] *πετάσῳ* conj. Sch. from Diosc. 2. 106; *πίλῳ* Ald.H.; *οἱ πέτασοι* are mentioned below (§ 9) without explanation. The comparison is omitted by G and Plin. *l.c.*

[7] *i.e.* that which carries the *κωδύα*.

8 οὗ γίνεται ὁ πῖλος. τὰ μὲν οὖν περὶ τὸν καρπὸν τοιαῦτα. ἡ δὲ ῥίζα παχυτέρα τοῦ καλάμου τοῦ παχυτάτου καὶ διαφύσεις ὁμοίως ἔχουσα τῷ καυλῷ. ἐσθίουσι δ' αὐτὴν καὶ ὠμὴν καὶ ἑφθὴν καὶ ὀπτήν, καὶ οἱ περὶ τὰ ἕλη τούτῳ σίτῳ χρῶνται. φύεται μὲν οὖν ὁ πολὺς αὐτόματος· οὐ μὴν ἀλλὰ καὶ καταβάλλουσιν ἐν πηλῷ ἀχυρώσαντες εὖ μάλα πρὸς τὸ κατενεχθῆναί τε καὶ μεῖναι καὶ μὴ διαφθαρῆναι· καὶ οὕτω κατασκευάζουσι τοὺς κυαμῶνας· ἂν δ' ἅπαξ ἀντιλάβηται, μένει διὰ τέλους. ἰσχυρὰ γὰρ ἡ ῥίζα καὶ οὐ πόρρω τῆς τῶν καλάμων πλὴν ἐπακανθίζουσα· δι' ὃ καὶ ὁ κροκόδειλος φεύγει μὴ προσκόψῃ τῷ ὀφθαλμῷ τῷ μὴ ὀξὺ καθορᾷν· γίνεται δὲ οὗτος καὶ ἐν Συρίᾳ καὶ κατὰ Κιλικίαν, ἀλλ' οὐκ ἐκπέττουσιν αἱ χῶραι· καὶ περὶ Τορώνην τῆς Χαλκιδικῆς ἐν λίμνῃ τινὶ μετρίᾳ τῷ μεγέθει· καὶ αὐτοῦ πέττεται τελέως καὶ τελεοκαρπεῖ.

9 Ὁ δὲ λωτὸς καλούμενος φύεται μὲν ὁ πλεῖστος ἐν τοῖς πεδίοις, ὅταν ἡ χώρα κατακλυσθῇ. τούτου δὲ ἡ μὲν τοῦ καυλοῦ φύσις ὁμοία τῇ τοῦ κυάμου, καὶ οἱ πέτασοι δὲ ὡσαύτως, πλὴν ἐλάττους καὶ λεπτότεροι. ἐπιφύεται δὲ ὁμοίως ὁ καρπὸς τῷ τοῦ κυάμου. τὸ ἄνθος αὐτοῦ λευκὸν ἐμφερὲς τῇ στενότητι τῶν φύλλων τοῖς τοῦ κρίνου, πολλὰ δὲ καὶ πυκνὰ ἐπ' ἀλλήλοις φύεται. ταῦτα δὲ ὅταν μὲν ὁ ἥλιος δύῃ συμμύει καὶ συγκαλύπτει τὴν κωδύαν, ἅμα δὲ τῇ ἀνατολῇ διοί-

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[1] ὁ πῖλος UMV; ἡ πῖλος Ald.H.; ?=*germen* Sch.
[2] *cf.* Diosc. 2. 107.
[3] καὶ καταβ. conj. W.; καταβ. Ald.; καταβ. δ' UMV.
[4] Plin. 13. 107 and 108.

pilos[1] is made. So much for the fruit. The root is thicker than the thickest reed, and is made up of distinct tubes, like the stalk. [2]They eat it both raw boiled and roasted, and the people of the marshes make this their food. It mostly grows of its own accord; however they also sow[3] it in the mud, having first well mixed the seed with chaff, so that it may be carried down and remain in the ground without being rotted; and so they prepare the 'bean' fields, and if the plant once takes hold it is permanent. For the root is strong and not unlike that of reeds, except that it is prickly on the surface. Wherefore the crocodile avoids it, lest he may strike his eye on it, since he has not sharp sight. This plant also grows in Syria and in parts of Cilicia, but these countries cannot ripen it; also about Torone in Chalcidice in a certain lake of small size; and this lake ripens it perfectly and matures its fruit.

[4]The plant called the *lotos* (Nile water-lily) grows chiefly in the plains when the land is inundated. The character of the stalk of this plant is like that of the 'Egyptian bean,' and so are the 'hat-like' leaves,[5] except that they are smaller and slenderer. And the fruit[6] grows on the stalk in the same way as that of the 'bean.' The flower is white, resembling in the narrowness of its petals those of the lily,[7] but there are many petals growing close one upon another. When the sun sets, these close[8] and cover up the 'head,' but with sunrise they open and

[5] *cf.* 4. 8. 7.

[6] *καρπὸς* conj. W.; *λωτὸς* MSS. Possibly the fruit was specially called *λωτός*.

[7] *cf.* Hdt. 2. 92; Diosc. 4. 113.

[8] *δύῃ, συμμύει* conj. St.; *συμμύει* MV; *συμμύῃ* U; *συμμύῃ* (omitting *καὶ*) Ald. H.

γεται καὶ ὑπὲρ τοῦ ὕδατος γίνεται. τοῦτο δὲ ποιεῖ μέχρι ἂν ἡ κωδύα ἐκτελεωθῇ καὶ τὰ ἄνθη
10 περιρρυῇ. τῆς δὲ κωδύας τὸ μέγεθος ἡλίκον μήκωνος τῆς μεγίστης, καὶ διέζωσται ταῖς κατατομαῖς τὸν αὐτὸν τρόπον τῇ μήκωνι· πλὴν πυκνότερος ἐν ταύταις ὁ καρπός. ἔστι δὲ παρόμοιος τῷ κέγχρῳ. ἐν δὲ τῷ Εὐφράτῃ τὴν κωδύαν φασὶ καὶ τὰ ἄνθη δύνειν καὶ ὑποκαταβαίνειν τῆς ὀψίας μέχρι μεσῶν νυκτῶν καὶ τῷ βάθει πόρρω· οὐδὲ γὰρ καθιέντα τὴν χεῖρα λαβεῖν εἶναι. μετὰ δὲ ταῦτα ὅταν ὄρθρος ᾖ πάλιν ἐπανιέναι καὶ πρὸς ἡμέραν ἔτι μᾶλλον, ἅμα τῷ ἡλίῳ φανερὸν <ὂν> ὑπὲρ τοῦ ὕδατος καὶ ἀνοίγειν τὸ ἄνθος, ἀνοιχθέντος δὲ ἔτι ἀναβαίνειν· συχνὸν δὲ τὸ ὑπεραῖρον
11 εἶναι τὸ ὕδωρ. τὰς δὲ κωδύας ταύτας οἱ Αἰγύπτιοι συνθέντες εἰς τὸ αὐτὸ σήπουσιν· ἐπὰν δὲ σαπῇ τὸ κέλυφος, ἐν τῷ ποταμῷ κλύζοντες ἐξαιροῦσι τὸν καρπόν, ξηράναντες δὲ καὶ πτίσαντες ἄρτους ποιοῦσι καὶ τούτῳ χρῶνται σιτίῳ. ἡ δὲ ῥίζα τοῦ λωτοῦ καλεῖται μὲν κόρσιον, ἐστὶ δὲ στρογγύλη, τὸ μέγεθος ἡλίκον μῆλον Κυδώνιον· φλοιὸς δὲ περίκειται περὶ αὐτὴν μέλας ἐμφερὴς τῷ καστανάικῷ καρύῳ· τὸ δὲ ἐντὸς λευκόν, ἑψόμενον δὲ καὶ ὀπτώμενον γίνεται λεκιθῶδες, ἡδὺ δὲ ἐν τῇ προσφορᾷ· ἐσθίεται δὲ καὶ ὠμή, ἀρίστη δὲ ἐν [τῷ] ὕδατι ἐφθὴ καὶ ὀπτή. καὶ τὰ μὲν ἐν τοῖς ὕδασιν σχεδὸν ταῦτά ἐστιν.

12 Ἐν δὲ τοῖς ἀμμώδεσι χωρίοις, ἃ ἐστιν οὐ πόρρω

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[1] *cf.* Diosc. *l.c.* [2] *cf. C.P.* 2. 19. 1; Plin. 13. 109.
[3] ὀψίας conj. W. from Plin. *l.c.*; ? ὀψίας ὥρας.
[4] <ὂν> add. W.
[5] κέλυφος *i.e.* fruit: καρπόν *i.e.* seeds.

appear above the water. This the plant does until the 'head' is matured and the flowers have fallen off. [1] The size of the 'head' is that of the largest poppy, and it has grooves all round it in the same way as the poppy, but the fruit is set closer in these. This is like millet. [2] In the Euphrates they say that the 'head' and the flowers sink and go under water in the evening [3] till midnight, and sink to a considerable depth; for one can not even reach them by plunging one's hand in; and that after this, when dawn comes round, they rise and go on rising towards day-break, being [4] visible above the water when the sun appears; and that then the plant opens its flower, and, after it is open, it still rises; and that it is a considerable part which projects above the water. These 'heads' the Egyptians heap together and leave to decay, and when the 'pod' [5] has decayed, they wash the 'head' in the river and take out the 'fruit,' [5] and, having dried and pounded [6] it, they make loaves of it, which they use for food. The root of the *lotos* is called *korsion*,[7] and it is round and about the size of a quince; it is enclosed in a black 'bark,' like the shell of a chestnut. The inside is white; but when it is boiled or roasted, it becomes of the colour of the yolk of an egg and is sweet to taste. The root is also eaten raw, though it is best when boiled in water or roasted.[8] Such are the plants found in water.

In sandy places which are not [9] far from the river

[6] *πτίσαντες*: *cf.* Hdt. 2. 92. [7] *cf.* Strabo 17. 2. 4.

[8] *ἐσθίεται . . . ὀπτή* conj. Sch. from Plin. *l.c.* and G; *ἐσθ. δὲ καὶ ὠμόν· ἀρίστη δὲ ἐν τοῖς ὕδασιν αὐτὴ ὠμή* Ald.; *ἀρίστη δὲ καὶ τοῖς ὕδασιν αὐτὴν* UMV, then *ομή* U, *ὠμῆ* V, *ὠμή* M; *ἀρίστη δὲ ἐν τῷ ὕδατι ἐφθὴ ἢ καὶ ὀπτή* H.

[9] *οὐ* was apparently not in Pliny's text; (21. 88.)

τοῦ ποταμοῦ, φύεται κατὰ γῆς ὃ καλεῖται μαλιναθάλλη, στρογγύλον τῷ σχήματι μέγεθος δὲ ἡλίκου μέσπιλον ἀπύρηνον δὲ ἄφλοιον· φύλλα δὲ ἀφίησιν ἀπ' αὐτοῦ ὅμοια κυπείρῳ· ταῦτα συνάγοντες οἱ κατὰ τὴν χώραν ἕψουσιν ἐν βρυτῷ τῷ ἀπὸ τῶν κριθῶν καὶ γίνεται γλυκέα σφόδρα· χρῶνται δὲ πάντες ὥσπερ τραγήμασι.

13 Τοῖς δὲ βουσὶ καὶ τοῖς προβάτοις ἅπαντα μὲν τὰ φυόμενα ἐδώδιμά ἐστιν, ἓν δέ τι γένος ἐν ταῖς λίμναις καὶ τοῖς ἕλεσι φύεται διαφέρον, ὃ καὶ χλωρὸν νέμονται καὶ ξηραίνοντες παρέχουσι κατὰ χειμῶνα τοῖς βουσὶν ὅταν ἐργάσωνται· καὶ τὰ σώματα ἔχουσιν εὖ σίτου ἄλλο λαμβάνοντες οὐθέν.

14 Ἔστι δὲ καὶ ἄλλο παραφυόμενον αὐτόματον ἐν τῷ σίτῳ· τοῦτο δέ, ὅταν ὁ σῖτος ᾖ καθαρός, ὑποπτίσαντες καταβάλλουσι τοῦ χειμῶνος ὑγρὰν εἰς γῆν· βλαστήσαντος δὲ τεμόντες καὶ ξηράναντες παρέχουσι καὶ τοῦτο βουσὶ καὶ ἵπποις καὶ τοῖς ὑποζυγίοις σὺν τῷ καρπῷ τῷ ἐπιγινομένῳ· ὁ δὲ καρπὸς μέγεθος μὲν ἡλίκον σήσαμον, στρογγύλος δὲ καὶ τῷ χρώματι χλωρός, ἀγαθὸς δὲ διαφερόντως. ἐν Αἰγύπτῳ μὲν οὖν τὰ περιττὰ σχεδὸν ταῦτα ἄν τις λάβοι.

IX. Ἕκαστοι δὲ τῶν ποταμῶν ἐοίκασιν ἴδιόν τι φέρειν, ὥσπερ καὶ τῶν χερσαίων. ἐπεὶ οὐδὲ ὁ τρίβολος ἐν ἅπασιν οὐδὲ πανταχοῦ φύεται, ἀλλ' ἐν τοῖς ἑλώδεσι τῶν ποταμῶν· ἐν μεγίστῳ δὲ βάθει πενταπήχει ἢ μικρῷ μείζονι, καθάπερ

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[1] Plin. *l.c.* *anthalium*, whence Salm. conj. ἀνθάλλιον.
[2] *Saccharum biflorum.* See Index App. (19).
[3] εὖ σίτου ἄλλο conj. W.; εὐσιτοῦντα Ald.

there grows under ground the thing called *malinathalle*[1]; this is round in shape and as large as a medlar, but has no stone and no bark. It sends out leaves like those of galingale. These the people of the country collect and boil in beer made from barley, and they become extremely sweet, and all men use them as sweetmeats.

All the things that grow in such places may be eaten by oxen and sheep, but there is one kind of plant[2] which grows in the lakes and marshes which is specially good for food: they graze their cattle on it when it is green, and also dry it and give it in the winter to the oxen after their work; and these keep in good condition when they have no other[3] kind of food.

There is also another plant[4] which comes up of its own accord among the corn; this, when the harvest is cleared, they crush slightly[5] and lay during the winter on[6] moist ground; when it shoots, they cut and dry it and give this also to the cattle and horses and beasts of burden with the fruit which forms on it. The fruit in size is as large as sesame, but round and green in colour, and exceedingly good. Such one might take to be specially remarkable plants of Egypt.

IX. Every river seems to bear some peculiar plant, just as does each part of the dry land. [7] For not even the water-chestnut grows in all rivers nor everywhere, but only in marshy rivers, and only in those whose depth is not more or not much more than five cubits.

[4] *Corchorus trilocularis.* See Index App. (20).

[5] G seems to have read ὑποπτίσαντες (*leviter pinsentes*); ὑποπτήσαντες W. with Ald.H.

[6] εἰς conj. W.; τὴν Ald.

[7] Plin. 21. 98; Diosc. 4. 15.

περὶ τὸν Στρυμόνα· σχεδὸν δὲ ἐν τοσούτῳ καὶ ὁ κάλαμος καὶ τὰ ἄλλα. ὑπερέχει δὲ οὐθὲν αὐτοῦ πλὴν αὐτὰ τὰ φύλλα ὥσπερ ἐπινέοντα καὶ κρύπτοντα τὸν τρίβολον, ὁ δὲ τρίβολος αὐτὸς ἐν τῷ ὕδατι νεύων εἰς βυθόν. τὸ δὲ φύλλον ἐστὶ πλατὺ προσεμφερὲς τῷ τῆς πτελέας, μίσχον δὲ
2 ἔχει σφόδρα μακρόν· ὁ δὲ καυλὸς ἐξ ἄκρου παχύτατος, ὅθεν τὰ φύλλα καὶ ὁ καρπός, τὰ δὲ κάτω λεπτότερος ἀεὶ μέχρι τῆς ῥίζης· ἔχει δὲ ἀποπεφυκότα ἀπ' αὐτοῦ τριχώδη τὰ μὲν πλεῖστα παράλληλα τὰ δὲ καὶ παραλλάττοντα, κάτωθεν ἀπὸ τῆς ῥίζης μεγάλα τὰ δὲ ἄνω ἀεὶ ἐλάττω προϊοῦσιν, ὥστε τὰ τελευταῖα μικρὰ πάμπαν εἶναι καὶ τὴν διαφορὰν μεγάλην τὴν ἀπὸ τῆς ῥίζης πρὸς τὸν καρπόν. ἔχει δὲ ἐκ τοῦ ἑνὸς καυλοῦ καὶ παραβλαστήματα πλείω· καὶ γὰρ τρία καὶ τέτταρα, μέγιστον δ' αἰεὶ τὸ πλησιαίτερον τῆς ῥίζης, εἶτα τὸ μετὰ τοῦτο καὶ τὰ ἄλλα κατὰ λόγον. τὸ δὲ παραβλάστημά ἐστιν ὥσπερ καυλὸς ἄλλος λεπτότερος μὲν τοῦ πρώτου, τὰ δὲ φύλλα καὶ τὸν καρπὸν ἔχων ὁμοίως. ὁ δὲ καρπὸς μέλας καὶ σκληρὸς σφόδρα. ῥίζαν δὲ ἡλίκην καὶ ποίαν ἔχει σκεπτέον. ἡ μὲν οὖν φύσις τοιαύτη. φύεται μὲν ἀπὸ τοῦ καρποῦ τοῦ πίπτοντος καὶ ἀφίησι βλαστὸν τοῦ ἦρος·
3 φασὶ δὲ οἱ μὲν εἶναι ἐπέτειον οἱ δὲ διαμένειν τὴν μὲν ῥίζαν εἰς χρόνον, ἐξ ἧς καὶ τὴν βλάστησιν εἶναι τοῦ καυλοῦ. τοῦτο μὲν οὖν σκεπτέον. ἴδιον δὲ παρὰ τἆλλα τὸ τῶν παραφυομένων ἐκ τοῦ καυλοῦ τριχωδῶν· οὔτε γὰρ φύλλα ταῦτα οὔτε καυλός· ἐπεὶ τό γε τῆς παραβλαστήσεως κοινὸν καλάμου καὶ ἄλλων.

as the Strymon. (In rivers of such a depth grow also reeds and other plants.) No part of it projects from the water except just the leaves; these float as it were and conceal the 'chestnut,' which is itself under water and bends down towards the bottom. The leaf is broad, like that of the elm, and has a very long stalk. The stem is thickest at the top, whence spring the leaves and the fruit; below it gets thinner down to the root. It has springing from it hair-like growths, most of which are parallel to each other, but some are irregular; below, starting from the root, they are large, but, as one gets higher up the plant, they become smaller, so that those at the top are quite small and there is a great contrast between the root and the top where the fruit grows. The plant also has on the same stalk several side-growths; of these there are three or four, and the largest is always that which is nearer to the root, the next largest is the one next above it, and so on in proportion: this sidegrowth is like another stalk, but slenderer than the original one, though like that it has leaves and fruit. The fruit is black and extremely hard. The size and character of the root are matter for further enquiry. Such is the character of this plant. It grows from the fruit which falls, and begins to grow in spring. Some say that it is annual, others that the root persists for a time, and that from it grows the new stalk. This then is matter for enquiry. However quite peculiar to this plant is the hair-like character of the growths which spring from the stalk; for these are neither leaves nor stalk; though reeds and other things have also sidegrowths.

X. Τὰ μὲν οὖν ἴδια θεωρητέον ἰδίως δῆλον ὅτι, τὰ δὲ κοινὰ κοινῶς. διαιρεῖν δὲ χρὴ καὶ ταῦτα κατὰ τοὺς τόπους, οἷον εἰ τὰ μὲν ἕλεια τὰ δὲ λιμναῖα τὰ δὲ ποτάμια μᾶλλον ἢ καὶ κοινὰ πάντων τῶν τόπων· διαιρεῖν δὲ καὶ ποῖα ταὐτὰ ἐν τῷ ὑγρῷ καὶ τῷ ξηρῷ φύεται, καὶ ποῖα ἐν τῷ ὑγρῷ μόνον, ὡς ἁπλῶς εἰπεῖν πρὸς τὰ κοινότατα εἰρημένα πρότερον.

Ἐν δ' οὖν τῇ λίμνῃ τῇ περὶ Ὀρχομενὸν τάδ' ἐστὶ τὰ φυόμενα δένδρα καὶ ὑλήματα, ἰτέα ἐλαίαγνος σίδη κάλαμος ὅ τε αὐλητικὸς καὶ ὁ ἕτερος κύπειρον φλεὼς τύφη, ἔτι γε μήνανθος ἴκμη καὶ τὸ καλούμενον ἴπνον. ὃ γὰρ προσαγορεύουσι λέμνα τούτου τὰ πλείω καθ' ὕδατός ἐστι.

2 Τούτων δὲ τὰ μὲν ἄλλα γνώριμα· ὁ δ' ἐλαίαγνος καὶ ἡ σίδη καὶ ἡ μήνανθος καὶ ἡ ἴκμη καὶ τὸ ἴπνον ἴσως μὲν φύεται καὶ ἑτέρωθι, προσαγορεύεται δὲ ἄλλοις ὀνόμασι· λεκτέον δὲ περὶ αὐτῶν. ἔστι δὲ ὁ μὲν ἐλαίαγνος φύσει μὲν θαμνῶδες καὶ παρόμοιον τοῖς ἄγνοις, φύλλον δὲ ἔχει τῷ μὲν σχήματι παραπλήσιον μαλακὸν δέ, ὥσπερ αἱ μηλέαι καὶ χνοῶδες. ἄνθος δὲ τῷ τῆς λεύκης ὅμοιον ἔλαττον· καρπὸν δὲ οὐδένα φέρει. φύεται δὲ ὁ πλεῖστος μὲν ἐπὶ τῶν πλοάδων νήσων· εἰσὶ γάρ τινες καὶ ἐνταῦθα πλοάδες, ὥσπερ ἐν Αἰγύπτῳ

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[1] τὰ δὲ κοινὰ κοινῶς conj. Sch. from G ; τὰ δὲ κοινῶς Ald.H.
[2] ταὐτὰ conj. Sch.; ταῦτα Ald.
[3] πρὸς τὰ κοιν. εἰρ. πρ. conj. W. supported by G ; κοινότατα προσειρημένα πρότερον Ald.H.

Of the plants peculiar to the lake of Orchomenos (Lake Copaïs), especially its reeds; and of reeds in general.

X. Plants peculiar to particular places must be considered separately, while a general account may be given of those which are generally distributed.[1] But even the latter must be classified according to locality; thus some belong to marshes, others to lakes, others to rivers, or again others may be common to all kinds of locality: we must also distinguish which occur alike[2] in wet and in dry ground, and which only in wet ground, marking these off in a general way from those mentioned above as being most impartial.[3]

Now in the lake near Orchomenos grow the following trees and woody plants: willow goat-willow water-lily reeds (both that used for making pipes and the other kind) galingale *phleos* bulrush: and also 'moon-flower' duckweed and the plant called marestail: as for the plant called water-chickweed the greater part of it grows under water.[4]

Now of these most are familiar: the goat-willow water-lily 'moon-flower' duckweed and marestail probably grow also elsewhere, but are called by different names. Of these we must speak. The goat-willow is of shrubby habit and like the chaste-tree: its leaf resembles that leaf in shape, but it is soft like that of the apple,[5] and downy. The bloom[6] is like that of the abele, but smaller, and it bears no fruit. It grows chiefly on the floating islands; (for here too there are floating islands, as in the marshes

[4] *τούτου τὰ πλείω καθ' ὑδ.* conj. Sch.; *τοῦτο πλείω τὸ καθ' ὑδ.* UM; *τοῦτο πλεῖον τὸ καθ' ὑδ.* Ald.

[5] *μηλέαι* perhaps here = quince (*μηλέα Κυδωνία*).

[6] *ἄνθος* here = catkin.

περὶ τὰ ἕλη καὶ ἐν Θεσπρωτίδι καὶ ἐν ἄλλαις λίμναις· ἐλάττων δὲ καθ' ὕδατος· ὁ μὲν οὖν ἐλαίαγνος τοιοῦτον.

3 Ἡ δὲ σίδη τὴν μὲν μορφὴν ἐστιν ὁμοία τῇ μήκωνι· καὶ γὰρ τὸ ἄνω κυτινῶδες τοιοῦτον ἔχει, πλὴν μεῖζον ὡς κατὰ λόγον· μεγέθει δὲ ὅλος ὁ ὄγκος ἡλίκον μῆλον· ἔστι δὲ οὐ γυμνόν, ἀλλὰ ὑμένες περὶ αὐτὴν λευκοί, καὶ ἐπὶ τούτοις ἔξωθεν φύλλα ποώδη παραπλήσια τοῖς τῶν ῥόδων ὅταν ἐν κάλυξιν ὦσι, τέτταρα τὸν ἀριθμόν· ἀνοιχθεῖσα δὲ τοὺς κόκκους ἐρυθροὺς μὲν ἔχει τῷ σχήματι δὲ οὐχ ὁμοίους ταῖς ῥόαις ἀλλὰ περιφερεῖς μικροὺς δὲ καὶ οὐ πολλῷ μείζους κέγχρου· τὸν δὲ χυλὸν ὑδατώδη τινά, καθάπερ ὁ τῶν πυρῶν. ἀδρύνεται δὲ τοῦ θέρους, μίσχον δὲ ἔχει μακρόν. τὸ δὲ ἄνθος ὅμοιον ῥόδου κάλυκι, μεῖζον δὲ καὶ σχεδὸν διπλάσιον τῷ μεγέθει. τοῦτο μὲν οὖν καὶ τὸ φύλλον ἐπὶ τοῦ ὕδατος· μετὰ δὲ ταῦτα, ὅταν ἀπανθήσῃ καὶ συστῇ τὸ περικάρπιον, κατακλίνεσθαί φασιν εἰς τὸ ὕδωρ μᾶλλον, τέλος δὲ συνάπτειν τῇ γῇ καὶ τὸν καρπὸν ἐκχεῖν.

4 Καρποφορεῖν δὲ τῶν ἐν τῇ λίμνῃ τοῦτο καὶ τὸ βούτομον καὶ τὸν φλεών. εἶναι δὲ τοῦ βουτόμου μέλανα, τῷ δὲ μεγέθει παραπλήσιον τῷ τῆς σίδης. τοῦ δὲ φλεὼ τὴν καλουμένην ἀνθήλην,

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[1] ἐλάττων . . . ὕδατος: sense doubtful. G. seems to render a different reading.

[2] *i.e.* the flower-head, which, as well as the plant, was called σίδη.

[3] μήκωνι can hardly be right: suspected by H.

[4] *cf.* Athen. 14. 64.

[5] *i.e.* petals.

of Egypt, in Thesprotia, and in other lakes). When it grows under water, it is smaller.[1] Such is the goat-willow.

The water-lily[2] is in shape like the poppy.[3] For the top of it has this character, being shaped like the pomegranate flower,[4] but it is longer in proportion to the size of the plant. Its size in fact as a whole is that of an apple; but it is not bare, having round it white membranes,[5] and attached to these on the outside are grass-green 'leaves,'[6] like those of roses when they are still in bud, and of these there are four; when it is opened it shews its seeds, which are red; in shape however they are not like pomegranate[7] seeds, but round small and not much longer than millet seeds; the taste is insipid, like that of wheat-grains. It ripens in summer and has a long stalk. The flower is like a rose-bud, but larger, almost twice as large. Now this and the leaf float on the water; but later, when the bloom is over and the fruit-case[8] has formed, they say that it sinks deeper into the water, and finally reaches the bottom and sheds its fruit.

Of the plants of the lake they say that water-lily sedge and *phleos* bear fruit, and that that of the sedge is black, and in size like that of the water-lily. The fruit of *phleos* is what is called the 'plume,'[9]

[6] *i.e.* sepals.

[7] *ῥόαις* conj. Bod. from Nic. *Ther.* 887 and Schol.; *ῥίζαις* UMVAld.H.

[8] *περικάρπιον* conj. W.; *κατακάρπιον* MSS. *κατα-* probably due to *κατακλίνεσθαι*.

[9] *cf.* Diosc. 3. 118. *ἀνθήλην*, sc. *καρπὸν εἶναι*. But Sch. suggests that further description of the fruit has dropped out, and that the clause *ᾧ . . . κονίας* does not refer to the fruit.

ᾧ χρῶνται πρὸς τὰς κονίας. τοῦτο δ' ἐστὶν οἷον πλακουντῶδές τι μαλακὸν ἐπίπυρρον. ἔτι δὲ καὶ τοῦ φλεὼ καὶ τοῦ βουτόμου τὸ μὲν θῆλυ ἄκαρπον, χρήσιμον δὲ πρὸς τὰ πλόκανα, τὸ δὲ ἄρρεν ἀχρεῖον.

Περὶ δὲ τῆς ἴκμης καὶ μηνάνθους καὶ τοῦ ἴπνου σκεπτέον.

5 Ἰδιώτατον δὲ τούτων ἐστὶν ἡ τύφη καὶ τῷ ἄφυλλον εἶναι καὶ τῷ μὴ πολύρριζον τοῖς ἄλλοις ὁμοίως· ἐπεὶ τἆλλα οὐχ ἧττον εἰς τὰ κάτω τὴν ὁρμὴν ἔχει καὶ τὴν δύναμιν· μάλιστα δὲ τὸ κύπειρον, ὥσπερ καὶ ἡ ἄγρωστις, δι' ὃ καὶ δυσώλεθρα καὶ ταῦτα καὶ ὅλως ἅπαν τὸ γένος τὸ τοιοῦτον. ἡ δὲ ῥίζα τοῦ κυπείρου πολύ τι τῶν ἄλλων παραλλάττει τῇ ἀνωμαλίᾳ, τῷ τὸ μὲν εἶναι παχύ τι καὶ σαρκῶδες αὐτῆς τὸ δὲ λεπτὸν καὶ ξυλῶδες· καὶ τῇ βλαστήσει καὶ τῇ γενέσει· φύεται γὰρ ἀπὸ τοῦ πρεμνώδους ἑτέρα λεπτὴ κατὰ πλάγιον, εἶτ' ἐν ταύτῃ συνίσταται πάλιν τὸ σαρκῶδες, ἐν ᾧ καὶ ὁ βλαστὸς ἀφ' οὗ ὁ καυλός· ἀφίησι δὲ καὶ εἰς βάθος τὸν αὐτὸν τρόπον ῥίζας, δι' ὃ καὶ πάντων μάλιστα δυσώλεθρον καὶ ἔργον ἐξελεῖν.

6 (Σχεδὸν δὲ παραπλησίως φύεται ἡ ἄγρωστις ἐκ τῶν γονάτων· αἱ γὰρ ῥίζαι γονατώδεις, ἐξ ἑκάστου δ' ἀφίησιν ἄνω βλαστὸν καὶ κάτωθεν ῥίζαν. ὡσαύτως δὲ καὶ ἡ ἄκανθα ἡ ἀκανώδης, ἀλλ' οὐ καλαμώδης οὐδὲ γονατώδης ἡ ῥίζα ταύ-

[1] κονίας : ? κονιάσεις (plastering), a conjecture mentioned by Sch.

and it is used as a soap-powder.[1] It is something like a cake, soft and reddish. Moreover the 'female' plant both of *phleos* and sedge is barren, but useful for basket-work,[2] while the 'male' is useless.

Duckweed 'moon-flower' and marestail require further investigation.

Most peculiar of these plants is the bulrush, both in being leafless and in not having so many roots as the others; for the others tend downwards quite as much as upwards, and shew their strength in that direction; and especially is this true of galingale, and also of dog's-tooth grass; wherefore these plants too and all others like them are hard to destroy. The root of galingale exceeds all the others in the diversity of characters which it shews, in that part of it is stout and fleshy, part slender and woody. So also is this plant peculiar in its way of shooting and originating; for from the trunk-like stock[3] grows another slender root[4] sideways, and on this again forms the fleshy part which contains the shoot from which the stalk springs.[5] In like manner it also sends out roots downwards; wherefore of all plants it is hardest to kill, and troublesome to get rid of.

(Dog's-tooth grass grows in almost the same way from the joints; for the roots are jointed, and from each joint it sends a shoot upwards and a root downwards. The growth of the spinous plant called corn-thistle[6] is similar, but it is not reedy and its

[2] *cf.* Hdt. 3. 98. [3] *i.e.* rhizome.

[4] *i.e.* stolon; *cf.* 1. 6. 8.

[5] *ἀφ' οὗ ὁ καυλός* transposed by W.: in Ald. these words come before *ἐν ᾧ*.

[6] *ἡ ἀκανώδης* I conj.: *κεάνωνος* UMV; *κεάνωθος* Ald.: *ἡ κεάνωθος* most edd.; G omits the word.

της. ταῦτα μὲν οὖν ἐπὶ πλεῖον διὰ τὴν ὁμοιότητα εἴρηται.)

Φύεται δ' ἐν ἀμφοῖν καὶ ἐν τῇ γῇ καὶ ἐν τῷ ὕδατι ἰτέα κάλαμος, πλὴν τοῦ αὐλητικοῦ, κύπειρον τύφη φλεὼς βούτομος· ἐν δὲ τῷ ὕδατι μόνον σίδη. περὶ γὰρ τῆς τύφης ἀμφισβητοῦσι. καλλίω δὲ καὶ μείζω τῶν ἐν ἀμφοῖν φυομένων αἰεὶ τὰ ἐν τῷ ὕδατι γίνεσθαί φασι. φύεσθαι δ' ἔνια τούτων καὶ ἐπὶ τῶν πλοάδων, οἷον τὸ κύπειρον καὶ τὸ βούτομον καὶ τὸν φλεών, ὥστε πάντα τὰ μέρη ταῦτα κατέχειν.

7 Ἐδώδιμα δ' ἐστὶ τῶν ἐν τῇ λίμνῃ τάδε· ἡ μὲν σίδη καὶ αὐτὴ[3] καὶ τὰ φύλλα τοῖς προβάτοις, ὁ δὲ βλαστὸς τοῖς ὑσίν, ὁ δὲ καρπὸς τοῖς ἀνθρώποις. τοῦ δὲ φλεὼ καὶ τῆς τύφης καὶ τοῦ βουτόμου τὸ πρὸς ταῖς ῥίζαις ἁπαλόν, ὃ μάλιστα ἐσθίει τὰ παιδία. ῥίζα δ' ἐδώδιμος ἡ τοῦ φλεὼ μόνη τοῖς βοσκήμασιν. ὅταν δ' αὐχμὸς ᾖ καὶ μὴ γένηται τὸ κατὰ κεφαλὴν ὕδωρ, ἅπαντα αὐχμεῖ τὰ ἐν τῇ λίμνῃ, μάλιστα δὲ ὁ κάλαμος, ὑπὲρ οὗ καὶ λοιπὸν εἰπεῖν· ὑπὲρ γὰρ τῶν ἄλλων σχεδὸν εἴρηται.

XI. Τοῦ δὴ καλάμου δύο φασὶν εἶναι γένη, τόν τε αὐλητικὸν καὶ τὸν ἕτερον· ἓν γὰρ εἶναι τὸ γένος τοῦ ἑτέρου, διαφέρειν δὲ ἀλλήλων ἰσχύϊ <καὶ παχύτητι> καὶ λεπτότητι καὶ ἀσθενείᾳ· καλοῦσι δὲ τὸν μὲν ἰσχυρὸν καὶ παχὺν χαρακίαν τὸν δ' ἕτερον πλόκιμον· καὶ φύεσθαι τὸν μὲν

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[1] *i.e.* we have gone beyond the list of typical plants of Orchomenus given 4. 10. 1, because we have found others of which much the same may be said.

[2] *cf.* 4. 10. 2.

[3] αὐτὴ : *cf.* 4. 10. 3 n.

root is not jointed. We have enlarged on these matters[1] because of the resemblance.)

The willow and the reed (not however the reed used for pipes) galingale bulrush *phleos* sedge grow both on land and in the water, water-lily only in the water. (As to bulrush indeed there is a difference of opinion.) However they say that those plants which grow in the water are always finer and larger than those that grow in both positions; also that some of these plants grow also on the floating islands,[2] for instance galingale sedge and *phleos*; thus all parts of the lake contain these plants.

Of the plants of the lake the parts good for food are as follows: of the water-lily both the flower[3] and the leaves are good for sheep, the young shoots for pigs, and the fruit for men. Of *phleos* galingale and sedge the part next the roots is tender, and is mostly eaten by children. The root of *phleos* is the only part which is edible by cattle. When there is a drought and there is no water from overhead,[4] all the plants of the lake are dried up, but especially the reed; of this it remains to speak, since we have said almost enough about the rest.

XI. [5] Of the reed there are said to be two kinds, the one used for making pipes and the other kind. For that of the latter there is only one kind, though individual plants differ in being strong and stout,[6] or on the other hand slender and weak. The strong stout one they call the 'stake-reed,' the other the 'weaving reed.' The latter they say grows on the

[4] κεφαλὴν UMVAld.; for the case *cf.* Xen. *Hell.* 7. 2. 8 and 11; κεφαλῆς conj. W.

[5] Plin. 16. 168 and 169.

[6] καὶ παχύτητι add. Dalec. from G.

πλόκιμον ἐπὶ τῶν πλοάδων τὸν δὲ χαρακίαν ἐπὶ τοῖς κώμυσι· κώμυθας δὲ καλοῦσι οὗ ἂν ᾖ συνηθροισμένος κάλαμος καὶ συμπεπλεγμένος ταῖς ῥίζαις· τοῦτο δὲ γίνεται καθ' οὓς ἂν τόπους τῆς λίμνης εὔγειον ᾖ χωρίον· γίνεσθαι δέ ποτε τὸν χαρακίαν καὶ οὗ ὁ αὐλητικός, μακρότερον μὲν τοῦ ἄλλου χαρακίου σκωληκόβρωτον δέ. τούτου μὲν οὖν ταύτας λέγουσι τὰς διαφοράς.

2 Περὶ δὲ τοῦ αὐλητικοῦ τὸ μὲν φύεσθαι δι' ἐννεατηρίδος, ὥσπερ τινές φασι, καὶ ταύτην εἶναι τὴν τάξιν οὐκ ἀληθές, ἀλλὰ τὸ μὲν ὅλον αὐξηθείσης γίνεται τῆς λίμνης· ὅτι δὲ τοῦτ' ἐδόκει συμβαίνειν ἐν τοῖς πρότερον χρόνοις μάλιστα δι' ἐννεατηρίδος, καὶ τὴν γένεσιν τοῦ καλάμου ταύτην ἐποίουν τὸ συμβεβηκὸς ὡς τάξιν λαμβάνον-
3 τες. γίνεται δὲ ὅταν ἐπομβρίας γενομένης ἐμμένῃ τὸ ὕδωρ δυ̂ ἔτη τοὐλάχιστον, ἂν δὲ πλείω καὶ καλλίων· τούτου δὲ μάλιστα μνημονεύουσι γεγονότος τῶν ὕστερον χρόνων ὅτε συνέβη τὰ περὶ Χαιρώνειαν· πρὸ τούτων γὰρ ἔφασαν ἔτη πλείω βαθυνθῆναι τὴν λίμνην· μετὰ δὲ ταῦτα ὕστερον, ὡς ὁ λοιμὸς ἐγένετο σφοδρός, πλησθῆναι μὲν αὐτήν, οὐ μείναντος δὲ τοῦ ὕδατος ἀλλ' ἐκλιπόντος χειμῶνος οὐ γενέσθαι τὸν κάλαμον· φασὶ γὰρ καὶ δοκεῖ βαθυνομένης τῆς λίμνης αὐξάνεσθαι τὸν κάλαμον εἰς μῆκος, μείναντα δὲ τὸν ἐπιόντα ἐνιαυτὸν ἀδρύνεσθαι· καὶ γίνεσθαι τὸν μὲν ἀδρυθέντα ζευγίτην, ᾧ δ' ἂν μὴ συμπαραμείνῃ τὸ

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[1] κώμυσι : lit ' bundles.'
[2] δν' ἔτη conj. W.; διετῆ UMVAld.
[3] B.C. 338.

floating islands, the stout form in the 'reed-beds'[1]; this name they give to the places where there is a thick mass of reed with its roots entangled together. This occurs in any part of the lake where there is rich soil. It is said that the 'stake-reed' is also sometimes found in the same places as the reed used for pipes, in which places it is longer than the 'stake-reed' found elsewhere, but gets worm-eaten. These then are the differences in reeds of which they tell.

As to the reed used for pipes, it is not true, as some say, that it only grows once in nine years and that this is its regular rule of growth; it grows in general whenever the lake is full: but, because in former days this was supposed to happen generally once in nine years, they made the growth of the reed to correspond, taking what was really an accident to be a regular principle. As a matter of fact it grows whenever after a rainy season the water remains in the lake for at least two years,[2] and it is finer if the water remains longer; this is specially remembered to have happened in recent times at the time of the battle of Chaeronea.[3] For before that period they told me that the lake was for several years deep[4]; and, at a time later than that, when there was a severe visitation of the plague, it filled up; but, as the water did not remain but failed in winter, the reed did not grow; for they say, apparently with good reason, that, when the lake is deep, the reed increases in height, and, persisting for the next year, matures its growth; and that the reed which thus matures is suitable for making a reed mouthpiece,[5] while that for which the water has not remained is

[4] ἔτη πλείω conj. Scal. from G; ἔτι πλείω UMV; ἔτι πλεῖον A d.

[5] See n. on τὸ στόμα τῶν γλαττῶν, § 4.

ὕδωρ βομβυκίαν. τὴν μὲν οὖν γένεσιν εἶναι τοιαύτην.

4 Διαφέρειν δὲ τῶν ἄλλων καλάμων ὡς καθ' ὅλου λαβεῖν εὐτροφίᾳ τινὶ τῆς φύσεως· εὐπληθέστερον γὰρ εἶναι καὶ εὐσαρκότερον καὶ ὅλως δὲ θῆλυν τῇ προσόψει. καὶ γὰρ τὸ φύλλον πλατύτερον ἔχειν καὶ λευκότερον τὴν δὲ ἀνθήλην ἐλάττω τῶν ἄλλων, τινὰς δὲ ὅλως οὐκ ἔχειν, οὓς καὶ προσαγορεύουσιν εὐνουχίας· ἐξ ὧν ἄριστα μέν φασί τινες γίνεσθαι τὰ ζεύγη, κατορθοῦν δὲ ὀλίγα παρὰ τὴν ἐργασίαν.

Τὴν δὲ τομὴν ὡραίαν εἶναι πρὸ Ἀντιγενίδου μέν, ἡνίκ' ηὔλουν ἁπλάστως, ὑπ' Ἄρκτουρον Βοηδρομιῶνος μηνός· τὸν γὰρ οὕτω τμηθέντα συχνοῖς μὲν ἔτεσιν ὕστερον γίνεσθαι χρήσιμον καὶ προκαταυλήσεως δεῖσθαι πολλῆς, συμμύειν δὲ τὸ στόμα τῶν γλωττῶν, ὃ πρὸς τὴν διακτηρίαν εἶναι
5 χρήσιμον. ἐπεὶ δὲ εἰς τὴν πλάσιν μετέβησαν, καὶ ἡ τομὴ μετεκινήθη· τέμνουσι γὰρ δὴ νῦν τοῦ Σκιρροφοριῶνος καὶ Ἑκατομβαιῶνος ὥσπερ πρὸ τροπῶν μικρὸν ἢ ὑπὸ τροπάς. γίνεσθαι δέ φασι τριένου τε χρήσιμον καὶ καταυλήσεως βραχείας

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[1] *βομβυκίαν*. In one kind of pipe the performer blew, not directly on to the 'reed,' but into a cap in which it was enclosed; this cap, from the resemblance in shape to a cocoon, was called *βόμβυξ*.

[2] *εἶναι* add. W.

[3] Plin. 16. 169–172. [4] September.

[5] *i.e.* between the free end of the vibrating 'tongue' and

suitable for making a 'cap.'[1] Such then, it is said, is[2] the reed's way of growth.

[3] Also it is said to differ from other reeds, to speak generally, in a certain luxuriance of growth, being of a fuller and more fleshy character, and, one may say, 'female' in appearance. For it is said that even the leaf is broader and whiter, though the plume is smaller than that of other reeds, and some have no plume at all; these they call 'eunuch-reeds.' From these they say that the best mouthpieces are made, though many are spoiled in the making.

Till the time of Antigenidas, before which men played the pipe in the simple style, they say that the proper season for cutting the reeds was the month Boëdromion[4] about the rising of Arcturus; for, although the reed so cut did not become fit for use for many years after and needed a great deal of preliminary playing upon, yet the opening[5] of the reed-tongues is well closed, which is a good thing for the purpose of accompaniment.[6] But when a change was made to the more elaborate style of playing, the time of cutting the reeds was also altered; for in our own time they cut them in the months Skirrophorion[7] or Hekatombaion[8] about the solstice or a little earlier.[9] And they say that the reed becomes fit for use in three years and needs but little preliminary playing upon, and that the reed-tongues

the body or 'lay' of the reed mouthpiece: the instrument implied throughout is apparently one with a single vibrating 'tongue' (reed) like the modern clarinet.

[6] διακτηρίαν UMV; διακτορίαν Ald. ? πρὸς τὸ ἀκροατήριον, 'for the concert-room'; *quod erat illis theatrorum moribus utilius* Plin. *l.c.*

[7] June. [8] July.

[9] ὥσπερ conj. W.; ὡσπερεὶ UH.; ὡς περὶ MVAld.

δεῖσθαι καὶ κατασπάσματα τὰς γλώττας ἴσχειν· τοῦτο δὲ ἀναγκαῖον τοῖς μετὰ πλάσματος αὐλοῦσι. τοῦ μὲν οὖν ζευγίτου ταύτας εἶναι τὰς ὥρας τῆς τομῆς.

6 Ἡ δ' ἐργασία γίνεται τοῦτον τὸν τρόπον· ὅταν συλλέξωσι τιθέασιν ὑπαίθριον τοῦ χειμῶνος ἐν τῷ λέμματι· τοῦ δ' ἤρος περικαθάραντες καὶ ἐκτρίψαντες εἰς τὸν ἥλιον ἔθεσαν. τοῦ θέρους δὲ μετὰ ταῦτα συντεμόντες εἰς τὰ μεσογονάτια πάλιν ὑπαίθριον τιθέασι χρόνον τινά. προσλείπουσι δὲ τῷ μεσογονατίῳ τὸ πρὸς τοὺς βλαστοὺς γόνυ· τὰ δὲ μήκη τὰ τούτων οὐ γίνεται διπαλαίστων ἐλάττω. βέλτιστα μὲν οὖν εἶναι τῶν μεσογονατίων πρὸς τὴν ζευγοποιΐαν ὅλου τοῦ καλάμου τὰ μέσα· μαλακώτατα δὲ ἴσχειν ζεύγη τὰ πρὸς τοὺς
7 βλαστούς, σκληρότατα δὲ τὰ πρὸς τῇ ῥίζῃ· συμφωνεῖν δὲ τὰς γλώττας τὰς ἐκ τοῦ αὐτοῦ μεσογονατίου, τὰς δὲ ἄλλας οὐ συμφωνεῖν· καὶ τὴν μὲν πρὸς τῇ ῥίζῃ ἀριστερὰν εἶναι, τὴν δὲ πρὸς τοὺς βλαστοὺς δεξιάν. τμηθέντος δὲ δίχα τοῦ μεσογονατίου τὸ στόμα τῆς γλώττης ἑκατέρας γίνεσθαι κατὰ τὴν τοῦ καλάμου τομήν· ἐὰν δὲ ἄλλον τρόπον ἐργασθῶσιν αἱ γλῶτται, ταύτας οὐ πάνυ συμφωνεῖν· ἡ μὲν οὖν ἐργασία τοιαύτη.

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[1] *κατασπάσματα*: lit. 'convulsions'; *i.e.* the strong vibrations of a 'tongue,' the free end of which is kept away from the body or 'lay' of the mouthpiece. Such a 'reed' would have the effect of giving to the pipes a fuller and louder tone.

[2] *i.e.* so as to make a closed end.

have ample vibration,[1] which is essential for those who play in the elaborate style. Such, they tell us, are the proper seasons for cutting the reed used for the reed mouthpiece.

The manufacture is carried out in the following manner. Having collected the reed-stems they lay them in the open air during the winter, leaving on the rind; in the spring they strip this off, and, having rubbed the reeds thoroughly, put them in the sun. Later on, in the summer, they cut the sections from knot to knot into lengths and again put them for some time in the open air. They leave the upper knot on this internodal section[2]; and the lengths thus obtained are not less than two palmsbreadths long. Now they say that for making mouthpieces the best lengths are those of the middle of the reed, whereas the lengths towards the upper growths make very soft mouthpieces and those next to the root very hard ones. They say too that the reed-tongues made out of the same length are of the same quality, while those made from different lengths are not; also that the one from the length next to the root forms a left-hand[3] reed-tongue, and that from the length towards the upper growths a right-hand[3] reed-tongue. Moreover, when the length is slit, the opening of the reed-tongues in either case is made towards the point at which the reed was cut[4]; and, if the reed-tongues are made in any other manner, they are not quite of the same quality. Such then is the method of manufacture.

[3] *i.e.* the vibrating 'tongues' (reeds) for the left-hand and the right-hand pipe of the Double Pipe respectively.

[4] *i.e.* not at the closed end, but at the end which was 'lower' when the cane was growing: *cf.* § 6, προσλείπουσι δὲ κ.τ.λ.

8 Φύεται δὲ πλεῖστος μὲν μεταξὺ τοῦ Κηφισοῦ καὶ τοῦ Μέλανος· οὗτος δὲ ὁ τόπος προσαγορεύεται μὲν Πελεκανία· τούτου δ' ἔστιν ἄττα Χύτροι καλούμενοι βαθύσματα τῆς λίμνης, ἐν οἷς κάλλιστόν φασι γίνεσθαι· <γίνεσθαι> δὲ καὶ καθ' ὃ ἡ Προβατία καλουμένη καταφέρεται· τοῦτο δ' ἐστὶ ποταμὸς ῥέων ἐκ Λεβαδείας. κάλλιστος δὲ δοκεῖ πάντων γίνεσθαι περὶ τὴν Ὀξεῖαν καλουμένην Καμπήν· ὁ δὲ τόπος οὗτός ἐστιν ἐμβολὴ τοῦ Κηφισοῦ. γειτνιᾷ δ' αὐτῷ πεδίον εὔγειον, ὃ
9 προσαγορεύουσι Ἱππίαν. πρόσβορρος δὲ τόπος ἄλλος τῆς Ὀξείας Καμπῆς ἐστιν, ὃν καλοῦσι Βοηδρίαν· φύεσθαι δέ φασι καὶ κατὰ ταύτην εὐγενῆ τὸν κάλαμον. τὸ δὲ ὅλον, οὗ ἂν ᾖ βαθύγειον καὶ εὔγειον χωρίον καὶ ἰλυῶδες καὶ ὁ Κηφισὸς ἀναμίσγεται καὶ πρὸς τούτοις βάθυσμα τῆς λίμνης, κάλλιστον γίνεσθαι κάλαμον. περὶ γὰρ τὴν Ὀξεῖαν Καμπὴν καὶ τὴν Βοηδρίαν πάντα ταῦτα ὑπάρχειν. ὅτι δὲ ὁ Κηφισὸς μεγάλην ἔχει ῥοπὴν εἰς τὸ ποιεῖν καλὸν τὸν κάλαμον σημεῖον ἔχουσι· καθ' ὃν γὰρ τόπον ὁ Μέλας καλούμενος ἐμβάλλει βαθείας οὔσης τῆς λίμνης καὶ τοῦ ἐδάφους εὐγείου καὶ ἰλυώδους, ἢ ὅλως μὴ γίνεσθαι ἢ φαῦλον. ἡ μὲν οὖν γένεσις καὶ φύσις τοῦ αὐλητικοῦ καὶ ἡ κατεργασία καὶ τίνας ἔχει διαφορὰς πρὸς τοὺς ἄλλους ἱκανῶς εἰρήσθω.

10 Γένη δὲ οὐ ταῦτα μόνον ἀλλὰ πλείω τοῦ καλάμου τυγχάνει φανερὰς ἔχοντα τῇ αἰσθήσει διαφοράς· ὁ μὲν γὰρ πυκνὸς καὶ τῇ σαρκὶ καὶ τοῖς

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[1] *cf.* Plut. *Sulla*, 20.
[2] *i.e.* the so-called 'Lake' Copaïs.
[3] καὶ add. W.

This reed grows in greatest abundance between the Kephisos and the Black River[1]; this district is called Pelekania, and in it are certain 'pots,' as they are called, which are deep holes in the marsh,[2] and in these holes they say that it grows fairest; it is also[3] said to be found[4] where the river called the 'Sheep River' comes down, which is a stream that flows from Lebadeia. But it appears to grow fairest of all near 'the Sharp Bend'; this place is the mouth of the Kephisos; near it is a rich plain called Hippias. There is another region north of the Sharp Bend called Boedrias; and here too they say that the reed grows fine, and in general that it is fairest wherever there is a piece of land with deep rich alluvial soil, where also Kephisos mingles[5] his waters with the soil, and where there is further a deep hole in the marsh; for that about the Sharp Bend and Boedrias all these conditions are found. As proof that the Kephisos has a great effect in producing the reed of good quality they have the fact that, where the river called the 'Black River' flows into the marsh, though the marsh is there deep and the bottom of good alluvial soil, it either does not grow at all or at best but of poor quality. Let this suffice for an account of the growth and character of the reed used for pipes, of the manufacture, and of its distinctive features as compared with other reeds.

But these are not the only kinds of reed; there are several others[6] with distinctive characters which are easily recognised; there is one that is of compact growth in flesh and has its joints close together;

[4] *γίνεσθαι* add. Sch.; *φασὶ γίνεσθαι δὲ καθ' ὃ* UMVP; so Ald., but *καθ' ὃν*.

[5] *ἀναμίσγεται* : ? *ἀναμίσγηται*; *cf.* Plut. *Sull. l.c.*

[6] Plin. 16. 164–167; Diosc. 1. 85.

γόνασιν, ὁ δὲ μανὸς καὶ ὀλιγογόνατος· καὶ ὁ μὲν κοῖλος, ὃν καλοῦσί τινες συριγγίαν, οὐδὲν γὰρ ὡς εἰπεῖν ἔχει ξύλου καὶ σαρκός· ὁ δὲ στερεὸς καὶ συμπλήρης μικροῦ. καὶ ὁ μὲν βραχύς, ὁ δὲ εὐαυξὴς καὶ ὑψηλὸς καὶ παχύς. ὁ δὲ λεπτὸς καὶ πολύφυλλος, ὁ δὲ ὀλιγόφυλλος καὶ μονόφυλλος. ὅλως δὲ πολλαί τινές εἰσι διαφοραὶ κατὰ τὰς χρείας· ἕκαστος γὰρ πρὸς ἕκαστα χρήσιμος.

11 Ὀνόμασι δὲ ἄλλοι ἄλλοις προσαγορεύουσι· κοινότατον δέ πως ὁ δόναξ, ὃν καὶ λοχμωδέστατόν γέ φασιν εἶναι καὶ μάλιστα φύεσθαι παρὰ τοὺς ποταμοὺς καὶ τὰς λίμνας. διαφέρειν δ' ὅμως παντὸς καλάμου πολὺ τόν τε ἐν τῷ ξηρῷ καὶ τὸν ἐν τοῖς ὕδασι φυόμενον. ἴδιος δὲ καὶ ὁ τοξικός, ὃν δὴ Κρητικόν τινες καλοῦσιν· ὀλιγογόνατος μὲν σαρκωδέστερος δὲ πάντων καὶ μάλιστα κάμψιν δεχόμενος, καὶ ὅλως ἄγεσθαι δυνάμενος ὡς ἂν θέλῃ τις θερμαινόμενος.

12 Ἔχουσι δέ, ὥσπερ ἐλέχθη, καὶ κατὰ τὰ φύλλα μεγάλας διαφορὰς οὐ πλήθει καὶ μεγέθει μόνον ἀλλὰ καὶ χροιᾷ. ποικίλος γὰρ ὁ Λακωνικὸς καλούμενος. ἔτι δὲ τῇ θέσει καὶ προσφύσει· κάτωθεν γὰρ ἔνιοι πλεῖστα φέρουσι τῶν φύλλων, αὐτὸς δὲ ὥσπερ ἐκ θάμνου πέφυκε. σχεδὸν δέ τινές φασι καὶ τῶν λιμναίων ταύτην εἶναι τὴν διαφοράν, τὸ πολύφυλλον καὶ παρόμοιον ἔχειν τρόπον τινὰ τὸ φύλλον τῷ τοῦ κυπείρου καὶ

another that is of open growth, with few joints; there is the hollow reed called by some the 'tube-reed,'[1] inasmuch as it has hardly any wood or flesh; there is another which is solid and almost entirely filled with substance; there is another which is short, and another which is of strong growth tall and stout; there is one which is slender and has many leaves, another which has few leaves or only one. And in general there are many differences in natural character and in usefulness, each kind being useful for some particular purpose.

Some distinguish the various kinds by different names; commonest perhaps is the pole-reed, which is said to be of very bushy habit, and to grow chiefly by rivers and lakes. And it is said that there is a wide difference in reeds in general between those that grow on dry land and those that grow in the water. Quite distinct again is the 'archer's' reed, which some call the 'Cretan': this has few joints and is fleshier than any of the others; it can also be most freely bent, and in general, when warmed, may be turned about as one pleases.

The various kinds have also, as was said, great differences in the leaves, not only in number and size, but also in colour. That called the 'Laconian' reed is parti-coloured. They also differ in the position and attachment of the leaves; some have most of their leaves low down, and the reed itself grows out of a sort of a bush. Indeed some say that this may be taken as the distinctive character of those which grow in lakes, namely, that these have many leaves, and that their foliage in a manner

συριγγίαν conj. Sch. from Plin. *l.c.*, *syringiam*; *cf.* Diosc. *l.c.*, *Geop.* 2. 6. 23. *συριγί* U; *σύριγγι* MV; *σύριγγα* Ald.H.

φλεὼ καὶ θρύου καὶ βουτόμου· σκέψασθαι δὲ δεῖ τοῦτο.

13 Γένος δέ τι καλάμου φύεται καὶ ἐπίγειον, ὃ οὐκ εἰς ὀρθὸν ἀλλ' ἐπὶ γῆς ἀφίησι τὸν καυλόν, ὥσπερ ἡ ἄγρωστις, καὶ οὕτως ποιεῖται τὴν αὔξησιν. ἔστι δὲ ὁ μὲν ἄρρην στερεός, καλεῖται δὲ ὑπό τινων εἰλετίας. . . .

Ὁ δὲ Ἰνδικὸς ἐν μεγίστῃ διαφορᾷ καὶ ὥσπερ ἕτερον ὅλως τὸ γένος· ἔστι δὲ ὁ μὲν ἄρρην στερεός, ὁ δὲ θῆλυς κοῖλος· διαιροῦσι γὰρ καὶ τοῦτον τῷ ἄρρενι καὶ θήλει. φύονται δ' ἐξ ἑνὸς πυθμένος πολλοὶ καὶ οὐ λοχμώδεις· τὸ δὲ φύλλον οὐ μακρὸν ἀλλ' ὅμοιον τῇ ἰτέᾳ· τῷ δὲ μεγέθει μεγάλοι καὶ εὐπαγεῖς, ὥστε ἀκοντίοις χρῆσθαι. φύονται δὲ οὗτοι περὶ τὸν Ἀκεσίνην ποταμόν. ἅπας δὲ κάλαμος εὔζωος καὶ τεμνόμενος καὶ ἐπικαιόμενος καλλίων βλαστάνει· ἔτι δὲ παχύρριζος καὶ πολύρριζος, δι' ὃ καὶ δυσώλεθρος. ἡ δὲ ῥίζα γονατώδης, ὥσπερ ἡ τῆς ἀγρωστίδος, πλὴν οὐ παντὸς ὁμοίως. ἀλλὰ περὶ μὲν καλάμων ἱκανῶς εἰρήσθω.

XII. Κατάλοιπον δὲ εἰπεῖν ὡσὰν ἐκ τοῦ γένους τούτου περὶ σχοίνου· καὶ γὰρ καὶ τοῦτο τῶν ἐνύδρων θετέον. ἔστι δὲ αὐτοῦ τρία εἴδη, καθάπερ τινὲς διαιροῦσιν, ὅ τε ὀξὺς καὶ ἄκαρπος, ὃν δὴ καλοῦσιν ἄρρενα, καὶ ὁ κάρπιμος, ὃν μελαγκρανὶν

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[1] *θρύον*, a kind of grass (see Index ; *cf.* Hom. *Il.* 21. 351), conj. Sch.; *βρύον* MSS. ; however Plut. *Nat. Quaest.* 2 gives *βρύον* along with *τύφη* and *φλεώς* in a list of marsh plants.

[2] δὲ *δεῖ τοῦτο* conj. W.; δὲ *τοῦτο* UMVAld.

resembles that of galingale *phleos thryon* [1] and sedge; but this needs [2] further enquiry.

There is also a kind of reed (bush-grass) which grows on land, and which is not erect, but sends out its stem over the ground, like the dog's-tooth grass, and so makes its growth. The 'male' reed is solid: some call it *eiletias*. . . . .[3]

The Indian reed (bamboo) is very distinct, and as it were a totally different kind; the 'male' is solid and the 'female' hollow (for in this kind too they distinguish a 'male' and a 'female' form); a number of reeds of this kind grow from one base and they do not form a bush; the leaf is not long, but resembles the willow leaf; these reeds are of great size and of good substance, so that they are used for javelins. They grow by the river Akesines.[4] All reeds are tenacious of life, and, if cut or burnt down, grow up again more vigorously; also their roots are stout and numerous, so that the plant is hard to destroy. The root is jointed, like that of the dog's-tooth grass, but this is not equally so in all kinds. However let this suffice for an account of reeds.

Of rushes.

XII. It remains to speak of the rush,[5] as though it belonged to this class of plants, inasmuch as we must reckon this also among water plants. Of this there are three kinds[6] as some distinguish, the 'sharp' rush, which is barren and is called the 'male'; the 'fruiting' kind which we call the 'black-

[3] Sch. marks a lacuna; there is nothing to correspond to ὁ μὲν ἄρρην. [4] Chenab.
[5] *cf.* 1. 5. 3; 1. 8. 1; Plin. 21. 112–115; Diosc. 4. 52.
[6] See Index.

καλοῦμεν διὰ τὸ μέλανα τὸν καρπὸν ἔχειν, παχύτερος δὲ οὗτος καὶ σαρκωδέστερος· καὶ τρίτος τῷ μεγέθει καὶ τῇ παχύτητι καὶ εὐσαρκίᾳ διαφέρων ὁ καλούμενος ὁλόσχοινος.

2 Ἡ μὲν οὖν μελαγκρανὶς αὐτός τις καθ' αὑτόν· ὁ δ' ὀξὺς καὶ ὁλόσχοινος ἐκ τοῦ αὐτοῦ φύονται· ὃ καὶ ἄτοπον φαίνεται, καὶ θαυμαστόν γ' ἦν ἰδεῖν ὅλης κομισθείσης τῆς σχοινιᾶς· οἱ πολλοὶ γὰρ ἦσαν ἄκαρποι πεφυκότες ἐκ τοῦ αὐτοῦ, κάρπιμοι δὲ ὀλίγοι. τοῦτο μὲν οὖν ἐπίσκεπτέον. ἐλάττους δὲ ὅλως οἱ κάρπιμοι· πρὸς γὰρ τὰ πλέγματα χρησιμώτερος ὁ ὁλόσχοινος διὰ τὸ σαρκῶδες καὶ μαλακόν. κορυνᾷ δ' ὅλως ὁ κάρπιμος ἐξ αὐτοῦ τοῦ γραμμώδους ἐξοιδήσας, κἄπειτα ἐκτίκτει καθάπερ ὠά. πρὸς μιᾷ γὰρ ἀρχῇ γραμμώδει ἔχει τοὺς περισταχυώδεις μίσχους, ἐφ' ὧν ἄκρων παραπλαγίους τὰς τῶν ἀγγείων ἔχει στρογγυλότητας ὑποχασκούσας· ἐν τούτοις δὲ τὸ σπερμάτιον ἀκιδῶδές ἐστι μέλαν ἑκάστῳ προσεμφερὲς
3 τῷ τοῦ ἀστερίσκου πλὴν ἀμενηνότερον. ῥίζαν δὲ ἔχει μακρὰν καὶ παχυτέραν πολὺ τοῦ σχοίνου· αὕτη δ' αὐαίνεται καθ' ἕκαστον ἐνιαυτόν, εἶθ' ἑτέρα πάλιν ἀπὸ τῆς κεφαλῆς τοῦ σχοίνου καθίεται· τοῦτο δὲ καὶ ἐν τῇ ὄψει φανερὸν ἰδεῖν τὰς μὲν αὔας τὰς δὲ χλωρὰς καθιεμένας· ἡ δὲ κεφαλὴ ὁμοία τῇ τῶν κρομύων καὶ τῇ τῶν γητείων, συμ-

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[1] θ. γ' ἦν ἰδεῖν conj. W. from G; θ. ἐν γ' εἰδεῖν U; θ. ἔν γε ἰδεῖν MVP; θ. ἐνιδεῖν Ald.

[2] οἱ κάρπιμοι conj. R. Const.; οἱ καρποί Ald.H.

[3] γὰρ seems meaningless; G has *autem*.

[4] κορονᾷ; *cf.* 3. 5. 1.

[5] γραμμώδει conj. R. Const.; γραμμώδεις Ald.H.

head' because it has black fruit; this is stouter and fleshier: and third the 'entire rush,' as it is called, which is distinguished by its size stoutness and fleshiness.

Now the 'black-head' grows by itself, but the 'sharp' rush and the 'entire' rush grow from the same stock, which seems extraordinary, and indeed it was strange to see it[1] when the whole clump of rushes was brought before me; for from the same stock there were growing 'barren' rushes, which were the most numerous, and also a few 'fruiting' ones. This then is a matter for further enquiry. The 'fruiting'[2] ones are in general scarcer, for[3] the 'entire rush' is more useful for wicker-work because of its fleshiness and pliancy. The 'fruiting' rush in general produces a club-like[4] head which swells straight from the wiry stem, and then bears egg-like bodies; for attached to a single wiry[5] base it has its very spike-like[6] branches all round it, and on the ends of these it has its round vessels borne laterally and gaping[7]; in each of these is the small seed, which is pointed and black, and like that of the Michaelmas daisy, except that it is less solid. It has a long root, which is stouter than that of the ordinary rush; this withers every year, and then another strikes down again from the 'head'[8] of the plant. And it is easy to observe that some of the roots as they are let down are withered, some green. The 'head' is like that of an onion or long onion,

[6] *περισταχυώδεις* seems an impossible word; ? *περὶ αὐτὸν τοὺς σταχυώδεις.*

[7] *ὑποχασκούσας* conj. Sch.; *ἐπισχαζούσας* Ald. H.

[8] *i.e.* the part above ground; *cf.* Plin. *l.c.* Sch. has disposed of the idea that *κεφαλή* is here a 'bulbous' root.

πεφυκυῖά πως ἐκ πλειόνων εἰς ταὐτὸ καὶ πλατεῖα κάτωθεν ἔχουσα κελύφη ὑπέρυθρα. συμβαίνει δ' οὖν ἴδιον ἐπὶ τῶν ῥιζῶν εἰ αὐαίνονται κατ' ἐνιαυτὸν καὶ ἐκ τοῦ ἄνωθεν πάλιν ἡ γένεσις. τῶν μὲν οὖν σχοίνων τοιαύτη τις φύσις.

4 Εἰ δὲ καὶ ὁ βάτος καὶ ὁ παλίουρος ἔνυδρά πώς ἐστιν ἢ πάρυδρα, καθάπερ ἐνιαχοῦ, φανεραὶ σχεδὸν καὶ αἱ τούτων διαφοραί· περὶ ἀμφοῖν γὰρ εἴρηται πρότερον.

[Τῶν δὲ νήσων τῶν πλοάδων τῶν ἐν Ὀρχομενῷ τὰ μὲν μεγέθη παντοδαπὰ τυγχάνει, τὰ δὲ μέγιστα αὐτῶν ἐστιν ὅσον τριῶν σταδίων τὴν περίμετρον. ἐν Αἰγύπτῳ δὲ μάλιστα μεγάλα σφόδρα συνίσταται, ὥστε καὶ ὗς ἐν αὐταῖς ἐγγίνεσθαι πολλούς, οὓς καὶ κυνηγετοῦσι διαβαίνοντες.] καὶ περὶ μὲν ἐνύδρων ταῦτ' εἰρήσθω.

XIII. Περὶ δὲ βραχυβιότητος φυτῶν καὶ δένδρων τῶν ἐνύδρων ἐπὶ τοσοῦτον ἔχομεν ὡς ἂν καθ' ὅλου λέγοντες, ὅτι βραχυβιώτερα τῶν χερσαίων ἐστί, καθάπερ καὶ τὰ ζῶα. τοὺς δὲ καθ' ἕκαστον βίους ἱστορῆσαι δεῖ τῶν χερσαίων. τὰ μὲν οὖν ἄγριά φασιν οὐδεμίαν ἔχειν ὡς εἰπεῖν οἱ ὀρεοτύποι διαφοράν, ἀλλὰ πάντα εἶναι μακρόβια καὶ οὐθὲν βραχύβιον· αὐτὸ μὲν τοῦτο ἴσως ἀληθὲς λέγοντες· ἅπαντα γὰρ ὑπερτείνει πολὺ τὴν τῶν ἄλλων ζωήν. οὐ μὴν ἀλλ' ὅμως ἐστὶ τὰ μὲν μᾶλλον τὰ δ' ἧττον μακρόβια, καθάπερ ἐν τοῖς ἡμέροις· ποῖα

[1] 3. 18. 3 and 4; 4. 8. 1.

being, as it were, made up of several united together; it is broad, and underneath it has reddish scales. Now it is a peculiar fact about the roots of this plant that they wither every year and that the fresh growth of roots comes from the part of the plant which is above ground. Such is the character of rushes.

Bramble and Christ's thorn may be considered to some extent plants of the water or the waterside, as they are in some districts; but the distinctive characters of these plants are fairly clear, for we have spoken of both already.[1]

The floating islands of Orchomenos[2] are of various sizes, the largest being about three furlongs in circumference. But in Egypt very large ones form, so that even a number of boars are found in them, and men go across to the islands to hunt them. Let this account of water-plants suffice.

Of the length or shortness of the life of plants, and the causes.

XIII. As to the comparative shortness of life of plants and trees of the water we may say thus much as a general account, that, like the water-animals, they are shorter-lived than those of the dry land. But we must enquire into the lives of those of the dry land severally. Now the woodmen say that the wild kinds are almost[3] without exception long-lived, and none of them is short-lived: so far they may be speaking the truth; all such plants do live far longer than others. However, just as in the case of cultivated plants, some are longer-lived than others,

[2] *cf.* 4. 10. 2, to which § this note perhaps belongs.

[3] *ὡς εἰπεῖν* conj. Sch.; *ὡς εἰπεῖ* U; *ὡς εἴποι* MV; *ὡς ἂν εἴποιεν* Ald.H.

δὲ ταῦτα σκεπτέον. τὰ δὲ ἥμερα φανερῶς διαφέρει τῷ τὰ μὲν εἶναι μακρόβια τὰ δὲ βραχύβια· ὡς δ' ἁπλῶς εἰπεῖν τὰ ἄγρια τῶν ἡμέρων μακροβιώτερα καὶ ὅλως τῷ γένει καὶ τὰ ἀντιδιῃρημένα καθ' ἕκαστον, οἷον κότινος ἐλάας καὶ ἀχρὰς ἀπίου ἐρινεὸς συκῆς· ἰσχυρότερα γὰρ καὶ πυκνότερα καὶ ἀγονώτερα τοῖς περικαρπίοις.

2 Τὴν δὲ μακροβιότητα μαρτυροῦσιν ἐπί γέ τινων καὶ ἡμέρων καὶ ἀγρίων καὶ αἱ παραδεδομέναι φῆμαι παρὰ τῶν μυθολόγων· ἐλάαν μὲν γὰρ λέγουσι τὴν Ἀθήνῃσι, φοίνικα δὲ τὸν ἐν Δήλῳ, κότινον δὲ τὸν ἐν Ὀλυμπίᾳ, ἀφ' οὗ ὁ στέφανος· φηγοὺς δὲ τὰς ἐν Ἰλίῳ τὰς ἐπὶ τοῦ Ἴλου μνήματος· τινὲς δέ φασι καὶ τὴν ἐν Δελφοῖς πλάτανον Ἀγαμέμνονα φυτεῦσαι καὶ τὴν ἐν Καφύαις τῆς Ἀρκαδίας. ταῦτα μὲν οὖν ὅπως ἔχει τάχ' ἂν ἕτερος εἴη λόγος· ὅτι δέ ἐστι μεγάλη διαφορὰ τῶν δένδρων φανερόν· μακρόβια μὲν γὰρ τά τε προειρημένα καὶ ἕτερα πλείω· βραχύβια δὲ καὶ τὰ τοιαῦτα ὁμολογουμένως, οἷον ῥοιὰ συκῆ μηλέα, καὶ τούτων ἡ ἠρινὴ μᾶλλον καὶ ἡ γλυκεῖα τῆς ὀξείας, ὥσπερ τῶν ῥοῶν ἡ ἀπύρηνος. βραχύβια δὲ καὶ ἀμπέλων ἔνια γένη καὶ μάλιστα τὰ πολύκαρπα· δοκεῖ δὲ καὶ τὰ πάρυδρα βραχυβιώτερα

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[1] καὶ τὰ ἀντ. conj. W.; κατὰ ἀντ. UMV; τὰ ἀντ. Ald.H.
[2] περικαρπίοις : *cf. C.P.* 1. 17. 5.
[3] On the Acropolis : *cf.* Hdt. 8. 55 ; Soph. *O.C.* 694 foll.

and we must consider which these are. Cultivated plants plainly differ as to the length of their lives, but, to speak generally, wild plants are longer-lived than cultivated ones, both taken as classes, and also when one compares[1] the wild and cultivated forms of particular plants: thus the wild olive pear and fig are longer-lived than the corresponding cultivated trees; for the wild forms of these are stronger and of closer growth, and they do not produce such well-developed fruit-pulp.[2]

To the long-lived character of some plants, both cultivated and wild, witness is borne also by the tales handed down in mythology, as of the olive at Athens,[3] the palm in Delos,[4] and the wild olive at Olympia, from which the wreaths for the games are made; or again of the Valonia oaks at Ilium, planted on the tomb of Ilos. Again some say that Agamemnon planted the plane at Delphi, and the one at Kaphyai[5] in Arcadia. Now how this is may perhaps be another story, but anyhow it is plain that there is a great difference between trees in this respect: the kinds that have been mentioned, and many others besides, are long-lived, while the following are admittedly short-lived—pomegranate fig apple: and among apples the 'spring' sort and the 'sweet' apple are shorter-lived than the 'sour' apple, even as the 'stoneless' pomegranate is shorter-lived than the other kinds. Also some kinds of vine are short-lived, especially those which bear much fruit; and it appears that trees which grow by water are shorter-

[4] Under which Leto gave birth to Artemis and Apollo: *cf.* Paus. 8. 48. 3; Cic. *de Leg.* 1. 1.; Plin. 16. 238.

[5] Its planting is ascribed to Menelaus by Paus. 8. 23. 3.

τῶν ἐν τοῖς ξηροῖς εἶναι, οἷον ἰτέα λεύκη ἀκτὴ αἴγειρος.

3 Ἔνια δὲ γηράσκει μὲν καὶ σήπεται ταχέως, παραβλαστάνει δὲ πάλιν ἐκ τῶν αὐτῶν, ὥσπερ αἱ δάφναι καὶ αἱ μηλέαι τε καὶ αἱ ῥόαι καὶ τῶν φιλύδρων τὰ πολλά· περὶ ὧν καὶ σκέψαιτ' ἄν τις πότερα ταὐτὰ δεῖ λέγειν ἢ ἕτερα· καθάπερ εἴ τις τὸ στέλεχος ἀποκόψας, ὥσπερ ποιοῦσιν οἱ γεωργοί, πάλιν ἀναθεραπεύοι τοὺς βλαστούς, ἢ εἰ καὶ ὅλως ἐκκόψειεν ἄχρι τῶν ῥιζῶν καὶ ἐπικαύσειεν· καὶ γὰρ ταῦτα ποιοῦσιν, ὁτὲ δὲ καὶ ἀπὸ τοῦ αὐτομάτου συμβαίνει· πότερα δὴ τοῦτο ταὐτὸ δεῖ λέγειν ἢ ἕτερον; ᾗ μὲν γὰρ ἀεὶ τὰ μέρη τὰς αὐξήσεις καὶ φθίσεις φαίνεται παραλλάττοντα καὶ ἔτι τὰς διακαθάρσεις τὰς ὑπ' αὐτῶν, ταύτῃ μὲν ἂν δόξειε ταὐτὸν εἶναι· τί γὰρ ἂν ἐπὶ τούτων
4 ἢ ἐκείνων διαφέροι; ᾗ δ' ὥσπερ οὐσία καὶ φύσις τοῦ δένδρου μάλιστ' ἂν φαίνοιτο τὸ στέλεχος, ὅταν μεταλλάττῃ τοῦτο, κἂν τὸ ὅλον ἕτερον ὑπολάβοι τις, εἰ μὴ ἄρα διὰ τὸ ἀπὸ τῶν αὐτῶν ἀρχῶν εἶναι ταὐτὸ θείη· καίτοι πολλάκις συμβαίνει καὶ τὰς ῥίζας ἑτέρας εἶναι καὶ μεταβάλλειν τῶν μὲν σηπομένων τῶν δ' ἐξ ἀρχῆς βλαστανουσῶν. ἐπεί, ἐὰν ἀληθὲς ᾖ, ὥς γέ τινές φασι, τὰς ἀμπέλους μακρο-

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[1] *cf. C.P.* 2. 11. 5.

[2] ἀναθεραπεύοι conj. W.; ἀναθεραπεύει Ald.

[3] ἢ εἰ καὶ ὅλως conj. W.; ἃ εἰ καὶ καλῶς U; ἀεὶ καὶ καλῶς MV; καὶ εἰ καλῶς Ald.H.

[4] Sc. and then encourage new growth.

lived than those which live in dry places: this is true of willow abele elder and black poplar.

Some trees, though they grow old and decay quickly, shoot up again from the same stock,[1] as bay apple pomegranate and most of the water-loving trees. About these one might enquire whether one should call the new growth the same tree or a new one; to take a similar case, if, after cutting down the trunk, one should, as the husbandmen do, encourage[2] the new shoots to grow again, or if[3] one should cut the tree right down to the roots and burn the stump,[4] (for these things are commonly done, and they also sometimes occur naturally); are we then here too, to call the new growth the same tree, or another one? In so far as it is always the parts of the tree which appear to alternate their periods of growth and decay and also the prunings which they themselves thus make, so far the new and the old growth might seem to be the same tree; for what difference can there be in the one as compared with the other?[5] On the other hand, in so far as the trunk would seem to be above all the essential part of the tree, which gives it its special character, when this changes, one might suppose that the whole tree becomes something different—unless indeed one should lay down that to have the same starting-point constitutes identity; whereas it often[6] happens that the roots too are different and undergo a change, since some decay and others grow afresh.[7] For if it be true, as some assert, that the reason why the vine is the longest

[5] *i.e.* how can the substitution of one set of 'parts' for another destroy the identity of the tree as a whole?

[6] πολλάκις conj. Sch. from G; πολλὰ καὶ Ald.H.

[7] And so the 'starting-point' too is not constant.

βιωτάτας εἶναι τῷ μὴ φύειν ἑτέρας ἀλλ' ἐξ αὐτῶν ἀεὶ συναναπληροῦσθαι, γελοῖον ἂν ἴσως δοκοίη τοιαύτη σύγκρισις ἐὰν <μὴ> μένῃ τὸ στέλεχος· αὕτη γὰρ οἷον ὑπόθεσις καὶ φύσις δένδρων. τοῦτο μὲν οὖν ὁποτέρως ποτὲ λεκτέον οὐθὲν ἂν διενέγκαι
5 πρὸς τὰ νῦν. τάχα δ' ἂν εἴη μακροβιώτατον τὸ πάντως δυνάμενον ἀνταρκεῖν, ὥσπερ ἡ ἐλάα καὶ τῷ στελέχει καὶ τῇ παραβλαστήσει καὶ τῷ δυσωλέθρους ἔχειν τὰς ῥίζας. δοκεῖ δὲ ὁ βίος τῆς γε μιᾶς εἶναι, καθ' ὃν τὸ στέλεχος δεῖ τὴν ἀρχὴν τιθέντα μέτρον ἀναμετρεῖν τὸν χρόνον, μάλιστα περὶ ἔτη διακόσια. εἰ δ' ὅπερ ἐπὶ τῶν ἀμπέλων λέγουσί τινες, ὡς παραιρουμένων τῶν ῥιζῶν κατὰ μέρος δύναται διαμένειν τὸ στέλεχος, καὶ ἡ ὅλη φύσις ὁμοία καὶ ὁμοιοφόρος ὁποσονοῦν χρόνον, μακροβιώτατον ἂν εἴη πάντων. φασὶ δὲ δεῖν οὕτω ποιεῖν ὅταν ἤδη δοκῇ καταφέρεσθαι· κλήματά τε ἐπιβάλλειν καὶ καρποῦσθαι τὸν ἐνιαυτόν· μετὰ δὲ ταῦτα κατασκάψαντα ἐπὶ θάτερα τῆς ἀμπέλου περικαθᾶραι πάσας τὰς ῥίζας, εἶτ' ἐμπλῆσαι φρυγάνων καὶ ἐπαμήσασθαι
6 τὴν γῆν· τούτῳ μὲν οὖν τῷ ἔτει κακῶς φέρειν σφόδρα, τῷ δ' ὑστέρῳ βέλτιον, τῷ δὲ τρίτῳ καὶ

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[1] ἐξ αὐτῶν Ald., sc. τῶν ῥιζῶν; ἐκ τῶν αὐτῶν conj. W.

[2] *i.e.* such an argument practically assumes the permanence of the trunk, which in the case of the vine can hardly be considered apart from the root. δοκοίη τοιαύτη σύγκρισις I conj. from G; δικαιοτάτη σύγκρισις MVAld.; δικαιοτάτηι συγκρίσεις U; δοκοίη εἶναι ἡ σύγκρισις conj. Sch.; so W. in his earlier edition: in his later editions he emends wildly.

lived of trees, is that, instead of producing new roots, it always renews itself from the existing ones,[1] such an illustration must surely lead to an absurd conclusion,[2] unless[3] we assume that the stock persists, as it must do, since it is, as it were, the fundamental and essential part of a tree. However it cannot matter much for our present purpose which account is the right one. Perhaps we may say that the longest-lived tree is that which in all ways is able to persist,[4] as does the olive by its trunk, by its power of developing sidegrowth, and by the fact that its roots are so hard to destroy. It appears that the life of the individual olive (in regard to which one should make the trunk the essential part and standard[5] in estimating the time), lasts for about two hundred years.[6] But if it is true of the vine, as some say, that, if the roots are partly removed, the trunk is able to survive, and the whole character of the tree remains the same and produces like fruits for any period, however long, then the vine will be the longest-lived of all trees. They say that, when the vine seems to be deteriorating, this is what one should do :—one should encourage the growth of branches and gather the fruit that year ; and after that one should dig on one side of the vine and prune away all the roots on that side, and then fill the hole with brushwood and heap up the soil. In that year, they say, the vine bears very badly, but better in the next, while in the

[3] I have inserted *μὴ*, which G seems to have read.

[4] *ἀνταρκεῖν* U, *cf.* Ar. *Eq.* 540 ; *αὐταρκεῖν* Ald.

[5] *καθ' ὃν τὸ στέλεχος δεῖ τὴν ἀρχὴν τιθέντα* I conj. ; so G ; *καθ' ὃν στέλεχος ἤδη τὴν ἀρχὴν τιθέντα μέτρον* Ald.H. ; *εἰ δεῖ* for *ἤδη* U ; *καθ' ὃ τοῦ στελέχους δεῖ τὸν ὄγκον τιθέντα μέτρον* conj. W. ; *καθ' ὃν τὸ στ. ἤδη ἀρχὴν καὶ μέτρον χρὴ* conj. Sch. *cf.* end of § 4.

[6] Plin. 16. 241.

τετάρτῳ καθίστασθαι καὶ φέρειν πολλοὺς καὶ καλούς, ὥστε μηδὲν διαφέρειν ἢ ὅτε ἤκμαζεν· ἐπειδὰν δὲ πάλιν ἀποπληγῇ, θάτερον μέρος παρασκάπτειν καὶ θεραπεύειν ὁμοίως, καὶ οὕτως αἰεὶ διαμένειν· ποιεῖν δὲ τοῦτο μάλιστα δι' ἐτῶν δέκα· δι' ὃ καὶ κόπτειν οὐδέποτε τοὺς τοῦτο ποιοῦντας, ἀλλ' ἐπὶ γενεὰς πολλὰς ταὐτὰ τὰ στελέχη διαμένειν, ὥστε μηδὲ μεμνῆσθαι τοὺς φυτεύσαντας· τοῦτο μὲν οὖν ἴσως τῶν πεπειραμένων ἀκούοντα δεῖ πιστεύειν. τὰ δὲ μακρόβια καὶ βραχύβια διὰ τῶν εἰρημένων θεωρητέον.

XIV. Νοσήματα δὲ τοῖς μὲν ἀγρίοις οὔ φασι ξυμβαίνειν ὑφ' ὧν ἀναιροῦνται, φαύλως δὲ διατίθεσθαι καὶ μάλιστα ἐπιδήλως ὅταν χαλαζοκοπηθῇ ἢ βλαστάνειν μέλλοντα ἢ ἀρχόμενα ἢ ἀνθοῦντα, καὶ ὅταν ἢ πνεῦμα ψυχρὸν ἢ θερμὸν ἐπιγένηται κατὰ τούτους τοὺς καιρούς. ὑπὸ δὲ τῶν ὡραίων χειμώνων οὐδὲ ἂν ὑπερβάλλοντες ὦσιν οὐδὲν πάσχειν, ἀλλὰ καὶ ξυμφέρειν πᾶσι χειμασθῆναι· μὴ χειμασθέντα γὰρ κακοβλαστότερα γίνεσθαι. τοῖς δὲ ἡμέροις ἐστὶ πλείω νοσήματα, καὶ τὰ μὲν ὥσπερ κοινὰ πᾶσιν ἢ τοῖς πλείστοις τὰ δ' ἴδια κατὰ γένη. κοινὰ δὴ τό τε σκωληκοῦσθαι καὶ ἀστροβολεῖσθαι καὶ ὁ σφακελισμός. ἅπαντα γὰρ ὡς εἰπεῖν καὶ σκώληκας

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[1] ἀποπληγῇ : ἀπολήγῃ conj. Sch.
[2] Plin. 17. 216. [3] *cf. C.P.* 5. 8. 3.
[4] κατὰ γένη conj. W.; καὶ τὰ γένη UMV; καὶ κατὰ γένη Ald.

third and fourth it becomes normal again and bears many fair clusters, so that it is quite as good as when it was in its prime. And when it goes off again,[1] they say one should dig on the other side and apply the same treatment; and that so treated the tree lasts for ever; and this should be done at intervals of about ten years. And this is why those who adopt this treatment never cut down the vine, but the same stems remain for many generations, so that even those who planted the trees cannot remember doing so. However perhaps one should enquire of those who have had experience before accepting this statement. These examples may serve for considering which trees are long-lived and which short-lived.

Of diseases and injuries done by weather conditions.

XIV. [2] As to diseases—they say that wild trees are not liable to diseases which destroy them, but that they get into poor condition, and that most obviously when they are smitten with hail when either they are about to bud or are just budding or are in bloom; also when either a cold or a hot wind comes at such seasons: but that from seasonable storms, even if they be violent, they take no hurt,[3] but rather that it is good for them all to be exposed to weather: for, unless they are, they do not grow so well. Cultivated kinds however, they say, are subject to various diseases, some of which are, one may say, common to all or to most, while others are special to particular kinds.[4] General diseases are those[5] of being worm-eaten, of being sun-scorched, and rot.[6] All trees, it may be said,

[5] *κοινὰ δὴ τό τε* conj. W.; *κοινὰ καὶ τότε* UMV; *κοινά· οἷον τότε* Ald.H. [6] *cf.* 8. 10. 1.

ἴσχει πλὴν τὰ μὲν ἐλάττους τὰ δὲ πλείους, καθάπερ συκῆ μηλέα καὶ ἄπιος. ὡς δὲ ἁπλῶς εἰπεῖν ἥκιστα σκωληκοῦνται τὰ δριμέα καὶ ὀπώδη, καὶ ἀστροβολεῖται ὡσαύτως· μᾶλλον δὲ τοῖς νέοις ἢ τοῖς ἐν ἀκμῇ τοῦτο συμβαίνει, πάντων δὲ μάλιστα τῇ τε συκῇ καὶ τῇ ἀμπέλῳ.

3 Ἡ δ' ἐλάα πρὸς τῷ τοὺς σκώληκας ἴσχειν, οἳ δὴ καὶ τὴν συκῆν διαφθείρουσιν ἐντίκτοντες, φύει καὶ ἦλον· οἱ δὲ μύκητα καλοῦσιν, ἔνιοι δὲ λοπάδα· τοῦτο δ' ἐστὶν οἷον ἡλίου καῦσις. διαφθείρονται δ' ἐνίοτε καὶ αἱ νέαι ἐλάαι διὰ τὴν ὑπερβολὴν τῆς πολυκαρπίας. ἡ δὲ ψώρα καὶ οἱ προσφυόμενοι κοχλίαι συκῆς εἰσιν· οὐ πανταχοῦ δὲ τοῦτο συμβαίνει ταῖς συκαῖς, ἀλλ' ἔοικε καὶ τὰ νοσήματα γίνεσθαι κατὰ τοὺς τόπους, ὥσπερ τοῖς ζώοις· ἐπεὶ παρ' ἐνίοις οὐ ψωριῶσι, καθάπερ οὐδὲ περὶ τὴν Λίνειαν.

4 Ἁλίσκεται δὲ συκῆ μάλιστα καὶ σφακελισμῷ καὶ κράδῳ. καλεῖται δὲ σφακελισμὸς μὲν ὅταν αἱ ῥίζαι μελανθῶσι, κράδος δ' ὅταν οἱ κλάδοι· καὶ γὰρ καλοῦσί τινες κράδους, ὅθεν καὶ τοὔνομα τῇ νόσῳ· ὁ δ' ἐρινεὸς οὔτε κραδᾷ οὔτε σφακελίζει οὔτε ψωριᾷ οὔτε σκωληκοῦται ταῖς ῥιζαῖς ὁμοίως· οὐδὲ δὴ τὰ ἐρινά τινες ἀποβάλλουσιν οὐδ' ἐὰν ἐμφυτευθῶσιν εἰς συκῆν.

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[1] ὀπώδη UMVAld.; εὐώδη H., evidently from Plin. 17. 221. *cf. C.P.* 5. 9. 4 and 5.

[2] λοπάδα: Plin. 17. 223, *patella*. The ἦλος is an abortive bud, called in Italian *norolo*.

[3] ἡλίου καῦσις conj. Scal. from Plin. *l.c. veluti solis exustio*: so also G; ἡλοιαυτον U; ἦλοι αὐτὸν V; ἦλοι αὐτῶν M; ἦλοι αὐτῶν Ald. which W. prints provisionally.

have worms, but some less, as fig and apple, some more, as pear. Speaking generally, those least liable to be worm-eaten are those which have a bitter acrid[1] juice, and these are also less liable to sun-scorch. Moreover this occurs more commonly in young trees than in those which have come to their strength, and most of all it occurs in the fig and the vine.

The olive, in addition to having worms (which destroy the fig too by breeding in it), produces also a 'knot' (which some call a fungus, others a bark-blister[2]), and it resembles the effect of sun-scorch.[3] Also sometimes young olives are destroyed by excessive fruitfulness. The fig is also liable to scab, and to snails which cling to it. However this does not happen to figs everywhere, but it appears that, as with animals, diseases are dependent on local conditions; for in some parts, as about Aineia,[4] the figs do not get scab.

The fig is also often a victim to rot and to *krados*. It is called rot when the roots turn black, it is called *krados* when the branches do so; for some call the branches *kradoi*[5] (instead of *kladoi*), whence the name is transferred to the disease. The wild fig does not suffer from *krados* rot or scab, nor does it get so worm-eaten in its roots[6] as the cultivated tree; indeed some wild figs do not even shed their early fruit—not even if they are grafted[7] into a cultivated tree.

[4] *cf.* 5. 2. 1. [5] Evidently a dialectic form.

[6] *ῥίζαις* PAld.; *συκαῖς* W. after conj. of Sch.

[7] *ἐμφυτευθῶσιν* conj. Sch.; *ἔνι φυτ.* UMV; *ἔνια φυτ.* Ald. Apparently the object of such grafting was the 'caprification' of the cultivated tree (*cf.* 2. 8. 3); but grafting for this purpose does not seem to be mentioned elsewhere.

5 Ἡ δὲ ψώρα μάλιστα γίνεται ὅταν ὕδωρ ἐπὶ Πλειάδι γένηται μὴ πολύ· ἐὰν δὲ πολύ, ἀποκλύζεται· συμβαίνει δὲ τότε καὶ τὰ ἐρινὰ ἀπορρεῖν καὶ τοὺς ὀλύνθους. τῶν δὲ σκωλήκων τῶν ἐν ταῖς συκαῖς οἱ μὲν ἐξ αὐτῆς γίνονται οἱ δὲ ἐντίκτονται ὑπὸ τοῦ καλουμένου κεράστου· πάντες δὲ εἰς κεράστην ἀποκαθίστανται· φθέγγονται δὲ οἷον τριγμόν. νοσεῖ δὲ συκῆ καὶ ἐὰν ἐπομβρία γένηται· τά τε γὰρ πρὸς τὴν ῥίζαν καὶ αὐτὴ ἡ ῥίζα ὥσπερ μαδᾷ· τοῦτο δὲ καλοῦσι λοπᾶν.
6 ἡ δ' ἄμπελος τραγᾷ· τοῦτο δὲ μάλιστα αὐτῆς ἐστι πρὸς τῷ ἀστροβολεῖσθαι, ἢ ὅταν ὑπὸ πνευμάτων βλαστοκοπηθῇ ἢ ὅταν τῇ ἐργασίᾳ συμπάθῃ ἢ τρίτον ὑπτία τμηθῇ.

Ῥυὰς δὲ γίνεται, ὃ καλοῦσί τινες ψίνεσθαι, ὅταν ἐπινιφθῇ κατὰ τὴν ἀπάνθησιν ἢ ὅταν κρειττωθῇ· τὸ δὲ πάθος ἐστὶν ὥστε ἀπορρεῖν τὰς ῥᾶγας καὶ τὰς ἐπιμενούσας εἶναι μικράς. ἔνια δὲ καὶ ῥιγώσαντα νοσεῖ, καθάπερ ἡ ἄμπελος· ἀμβλοῦνται γὰρ οἱ ὀφθαλμοὶ τῆς πρωτοτόμου· καὶ πάλιν ὑπερθερμανθέντα· ζητεῖ γὰρ καὶ τούτων τὴν συμμετρίαν ὥσπερ καὶ τῆς τροφῆς. ὅλως δὲ πᾶν τὸ παρὰ φύσιν ἐπικίνδυνον.

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[1] *cf. C.P.* 5. 9. 10 ; Col. 5. 9. 15.

[2] *cf.* 5. 4. 5 ; *C.P.* 5. 10. 5 ; Plin. 17. 221.

[3] αὐτὴ ἡ ῥίζα I conj.; αὐτὴν τὴν ῥίζαν U ; om. Ald.

[4] *cf. C.P.* 5. 9. 12 ; Plin. 17. 225.

[5] *i.e.* shedding of the 'bark' of the roots. λοπᾶν conj. Sch., *cf. C.P.* 5. 9. 9 ; λοπάδα Ald.H., *cf.* 4. 14. 3 ; but the word here points to a different disease.

[6] ὑπτία τομή seems to be a technical term for pruning in such a way that the growth of the new wood is encouraged

Scab[1] chiefly occurs when there is not much rain after the rising of the Pleiad; if rain is abundant, the scab is washed off, and at such times it comes to pass that both the spring and the winter figs drop off. Of the worms found in fig-trees some have their origin in the tree, some are produced in it by the creature called the 'horned worm'; but they all turn into the 'horned worm';[2] and they make a shrill noise. The fig also becomes diseased if there is heavy rain; for then the parts towards the root and the root itself[3] become, as it were, sodden,[4] and this they call 'bark-shedding.'[5] The vine suffers from over-luxuriance; this, as well as sun-scorch, specially happens to it either when the young shoots are cut by winds, or when it has suffered from bad cultivation, or, thirdly, when it has been pruned upwards.[6]

The vine becomes a 'shedder,'[7] a condition which some call 'casting of the fruit,' if the tree is snowed upon at the time when the blossom falls, or else when it becomes over lusty;[8] what happens is that the unripe grapes drop off, and those that remain on the tree are small. Some trees also contract disease from frost, for instance the vine; for then the eyes of the vine that was pruned early become abortive; and this also happens from excessive heat, for the vine seeks regularity in these conditions too, as in its nourishment. And in general anything is dangerous which is contrary to the normal course of things.

and so there is less fruit: exact sense obscure; ? 'from below' (*i.e.* with the blade of the knife pointing upwards). *cf. C.P. l.c.*; Col. 4. 24. 15; Plin. *l.c.*, *in supinum excisis.*

[7] *cf. C.P.* 5. 9. 13.

[8] *κρειττωθῇ*: *i.e.* the growth is over-luxuriant. The word occurs elsewhere only in the parallel passage *C.P. l.c.*, where occurs also the subst. *κρείττωσις*, evidently a technical term.

7 Μεγάλα δὲ ξυμβάλλεται καὶ τὰ τραύματα καὶ αἱ πληγαὶ τῶν περισκαπτόντων εἰς τὸ μὴ φέρειν τὰς μεταβολὰς ἢ καυμάτων ἢ χειμώνων· ἀσθενὲς γὰρ ὂν διὰ τὴν ἕλκωσιν καὶ τὸν πόνον εὐχειρωτότατόν[2] ἐστι ταῖς ὑπερβολαῖς. σχεδὸν δέ, ὥς τινες οἴονται, τὰ πλεῖστα τῶν νοσημάτων ἀπὸ πληγῆς γίνεται· καὶ γὰρ τὰ ἀστρόβλητα καλούμενα καὶ τὰ σφακελίζοντα διὰ τὸ ἀπὸ ταύτης εἶναι τῶν ῥιζῶν τὸν πόνον[3]. οἴονται δὲ καὶ δύο ταύτας εἶναι μόνας νόσους· οὐ μὴν ἀλλὰ τοῦτό γ' οὐκ ἄγαν ὁμολογούμενόν ἐστι.

[Πάντων δ' ἀσθενέστατον ἡ μηλέα ἡ ἠρινὴ καὶ τούτων ἡ γλυκεῖα.][4]

8 Ἔνιαι δὲ πηρώσεις οὐκ εἰς φθορὰν γίνονται ὅλων ἀλλ' εἰς ἀκαρπίαν· οἷον ἐάν τις τῆς πίτυος ἀφέλῃ τὸ ἄκρον ἢ τοῦ φοίνικος, ἄκαρπα γίνεσθαι ἄμφω δοκεῖ καὶ οὐχ ὅλως ἀναιρεῖσθαι.

Γίνονται δὲ νόσοι καὶ τῶν καρπῶν αὐτῶν, ἐὰν μὴ κατὰ καιρὸν τὰ πνεύματα καὶ τὰ οὐράνια γένηται· συμβαίνει γὰρ ὁτὲ μὲν ἀποβάλλειν γενομένων ἢ μὴ γενομένων ὑδάτων, οἷον τὰς συκᾶς, ὁτὲ δὲ χείρους γίνεσθαι σηπομένους καὶ καταπνιγομένους ἢ πάλιν ἀναξηραινομένους παρὰ τὸ δέον. χείριστον δὲ ἐὰν ἀπανθοῦσί τισιν ἐφύσῃ, καθάπερ ἐλάᾳ καὶ ἀμπέλῳ· συναπορρεῖ γὰρ ὁ καρπὸς δι' ἀσθένειαν.

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[1] Plin. 17. 227.

[2] εὐχειρωτότατον conj. W. after Lobeck ; εὐχειρότατον Ald.

[3] πόνον conj. H. from G ; τόπον MVAld.

[4] This sentence is clearly out of place : the plural τούτων has nothing to refer to. *cf.* 4. 13. 2. It is represented however by Plin. *l.c.*

[1] Moreover the wounds and blows inflicted by men who dig about the vines render them less able to bear the alternations of heat and cold; for then the tree is weak owing to the wounding and to the strain put upon it, and falls an easy prey[2] to excess of heat and cold. Indeed, as some think, most diseases may be said to be due to a blow; for that even the diseases known as 'sun-scorch' and 'rot' occur because the roots have suffered in this way.[3] In fact they think that there are only these two diseases; but there is not general agreement on this point.

The 'spring apple' and especially the sweet form of it, has the weakest constitution.[4]

[5] Some mutilations however do not cause destruction of the whole[6] tree, but only produce barrenness; for instance, if one takes away the top of the Aleppo pine or the date-palm, the tree in both cases appears to become barren, but not to be altogether destroyed.

There are also diseases of the fruits themselves, which occur if the winds and rains do not come in due season. For it comes to pass[7] that sometimes trees, figs, for example, shed their fruit when rain does or does not come, and[8] sometimes the fruit is spoilt by being rotted and so choked off,[9] or again by being unduly dried up. It is worst of all for some trees, as olive and vine, if rain falls on them as they are dropping their blossom;[10] for then the fruit, having no strength, drops also.

[5] Plin. 17. 228 and 229.
[6] δλων conj. W.; τινων P_2Ald.H. *cf. C.P.* 5. 17. 3 and 6.
[7] *cf. C.P.* 5. 10. 5.
[8] δὲ add. Sch. [9] *cf. C.P. l.c.*
[10] ἀπανθοῦσι conj. Sch. from G and Plin. *l.c.*; ἐκανθοῦσι Ald.H.

9 Ἐν Μιλήτῳ δὲ τὰς ἐλάας, ὅταν ὦσι περὶ τὸ ἀνθεῖν, κάμπαι κατεσθίουσιν, αἱ μὲν τὰ φύλλα αἱ δὲ τὰ ἄνθη, ἕτεραι τῷ γένει, καὶ ψιλοῦσι τὰ δένδρα· γίνονται δὲ ἐὰν ᾖ νότια καὶ εὐδιεινά· ἐὰν δὲ ἐπιλάβῃ καύματα ῥήγνυνται.

Περὶ δὲ Τάραντα προφαίνουσι μὲν ἀεὶ πολὺν καρπόν, ὑπὸ δὲ τὴν ἀπάνθησιν τὰ πολλ' ἀπόλλυται. τὰ μὲν οὖν τοιαῦτα τῶν τόπων ἴδια.

10 Γίνεται δὲ καὶ ἄλλο νόσημα περὶ τὰς ἐλάας ἀράχνιον καλούμενον· φύεται γὰρ τοῦτο καὶ διαφθείρει τὸν καρπόν. ἐπικάει δὲ καὶ καύματά τινα καὶ ἐλάαν καὶ βότρυν καὶ ἄλλους καρπούς. οἱ δὲ καρποὶ σκωληκοῦνταί τινων, οἷον ἐλάας ἀπίου μηλέας μεσπίλης ῥόας. καὶ ὅ γε τῆς ἐλάας σκώληξ ἐὰν μὲν ὑπὸ τὸ δέρμα γένηται διαφθείρει τὸν καρπόν, ἐὰν δὲ τὸν πυρῆνα διαφάγῃ ὠφελεῖ. κωλύεται δὲ ὑπὸ τῷ δέρματι εἶναι ὕδατος ἐπ' Ἀρκτούρῳ γενομένου. γίνονται δὲ καὶ ἐν ταῖς δρυπεπέσι σκώληκες, αἴπερ καὶ χείρους εἰς τὴν ῥύσιν· ὅλως δὲ καὶ δοκοῦσιν εἶναι σαπραί· δι' ὃ καὶ γίνονται τοῖς νοτίοις καὶ μᾶλλον ἐν τοῖς ἐφύδροις. ἐγγίνονται δὲ καὶ κνῖπες ἔν τισι τῶν δένδρων, ὥσπερ ἐν τῇ δρυῒ καὶ τῇ συκῇ· καὶ δοκοῦσιν ἐκ τῆς ὑγρότητος συνίστασθαι τῆς ὑπὸ τὸν φλοιὸν συνισταμένης· αὕτη δέ ἐστι γλυκεῖα γενομένοις. γίνονται δὲ καὶ ἐν λαχάνοις τισίν,

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[1] *cf. C.P.* 5. 10. 3.
[2] Tarentum: *cf. C.P. l.c.*
[3] ἀπάνθησιν conj. W.; ἄνθησιν Ald.
[4] Plin. 17. 229–231.
[5] ἀράχνιον conj. Sch. after Meurs.; ἀρίχνιον UP_2; ἀρχίχνιον MVP; ἀρχίνιον Ald. *cf. C.P.* 5. 10. 2.

[1] In Miletus the vines at the time of flowering are eaten by caterpillars, some of which devour the flowers, others, a different kind, the leaves; and they strip the tree; these appear if there is a south wind and sunny weather; if the heat overtakes them, the trees split.

About Taras[2] the olives always shew much fruit, but most of it perishes at the time when the blossom falls.[3] Such are the drawbacks special to particular regions.

[4] There is also another disease incident to the olive, which is called cobweb;[5] for this forms[6] on the tree and destroys the fruit. Certain hot[7] winds also scorch both olive vine-cluster and other fruits. And the fruits of some get worm-eaten,[8] as olive pear apple medlar pomegranate. Now the worm which infests the olive, if it appears below the skin, destroys the fruit; but if it devours the stone it is beneficial. And it is prevented from appearing under the skin if there is rain after[9] the rising of Arcturus. Worms also occur in the fruit which ripens on the tree, and these are more harmful as affecting the yield of oil. Indeed these worms seem to be altogether rotten; wherefore they appear when there is a south wind and particularly in damp places. The *knips*[10] also occurs in certain trees, as the oak and fig, and it appears that it forms from the moisture which collects under the bark, which is sweet to the taste. Worms also occur[11] in some

[6] φύεται Ald.; ἐμφύεται conj. Sch. from *C.P. l.c.*, but the text is perhaps defective.

[7] *cf. C.P.* 5. 10. 5. [8] *cf. C.P.* 5. 10. 1.

[9] ἐπ' conj. Sch., *cf. C.P.* 5. 10. 1; ὑπ' U; ἀπ' Ald.H.

[10] *cf.* 2. 8. 3.

[11] The subject of γίνονται is probably σκώληκες, not κνῖπες.

ἔνθα δὲ κάμπαι διαφερούσης δῆλον ὅτι τῆς ἀρχῆς.

11 Καὶ τὰ μὲν νοσήματα σχεδὸν ταῦτα καὶ ἐν τούτοις ἐστίν. ἔνια δὲ πάθη τῶν κατὰ τὰς ὥρας καὶ τῶν κατὰ τοὺς τόπους γινομένων ἀναιρεῖν πέφυκεν, ἃ οὐκ ἄν τις εἴποι νόσους, οἷον λέγω τὴν ἔκπηξιν καὶ ὃ καλοῦσί τινες καυθμόν. ἄλλα δὲ παρ' ἑκάστοις πέφυκε πνεύματα ἀπολλύναι καὶ ἀποκάειν· οἷον ἐν Χαλκίδι τῆς Εὐβοίας Ὀλυμπίας ὅταν πνεύσῃ μικρὸν πρὸ τροπῶν ἢ μετὰ τροπὰς χειμερινὰς ψυχρός· ἀποκάει γὰρ τὰ δένδρα καὶ οὕτως αὖα ποιεῖ καὶ ξηρὰ ὡς οὐδ' ἂν ὑφ' ἡλίου καὶ χρόνου πολλοῦ γένοιτ' ἄν, δι' ὃ καὶ καλοῦσι καυθμόν· ἐγένετο δὲ πρότερον πολλάκις ἤδη καὶ ἐπ' Ἀρχίππου δι' ἐτῶν τετταράκοντα σφοδρός.

12 Πονοῦσι δὲ μάλιστα τῶν τόπων οἱ κοῖλοι καὶ οἱ αὐλῶνες καὶ ὅσοι περὶ τοὺς ποταμοὺς καὶ ἁπλῶς οἱ ἀπνευστότατοι· τῶν δένδρων δὲ μάλιστα συκῆ, δεύτερον δὲ ἐλάα. ἐλάας δὲ μᾶλλον ὁ κότινος ἐπόνησεν ἰσχυρότερος ὤν, ὃ καὶ θαυμαστὸν ἦν· αἱ δὲ ἀμυγδαλαῖ τὸ πάμπαν ἀπαθεῖς· ἀπαθεῖς δὲ καὶ αἱ μηλέαι καὶ αἱ ἄπιοι καὶ αἱ ῥόαι ἐγένοντο· δι' ὃ καὶ τοῦτο ἦν θαυμαστόν. ἀποκάεται δὲ εὐθὺς ἐκ τοῦ στελέχους, καὶ ὅλως δὲ μᾶλλον καὶ πρότερον ὡς εἰπεῖν ἅπτεται <τὰ ἄνω> τῶν κάτω. φανερὰ δὲ γίνεται τὰ μὲν ἅμα περὶ τὴν βλάστησιν,

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[1] Plin. 17. 232.

[2] τῶν κατὰ τούς τόπους conj. Sch. from Plin. *l.c.*; τῶν καθ' αὑτὰ Ald.

[3] ἔκπηξιν conj. Sch.; ἔκπληξιν UMP$_2$Ald. *cf. C.P.* 5. 12. 2, πῆξις.

[4] *cf. C.P.* 5. 12. 4.

pot-herbs, as also do caterpillars, though the origin of these is of course different.

Such are in general the diseases, and the plants in which they occur. Moreover[1] there are certain affections due to season or situation[2] which are likely to destroy the plant, but which one would not call diseases: I mean such affections as freezing[3] and what some call 'scorching.' Also[4] there are winds which blow in particular districts that are likely to destroy or scorch; for instance the 'Olympian' wind of Chalcis in Euboea, when it blows cold a little before or after the winter solstice; for this wind scorches up the trees and makes them more dry and withered than they would become from the sun's heat even in a long period; wherefore its effect is called 'scorching.' In old times it occurred very frequently, and it recurred with great violence in the time of Archippus, after an interval of forty years.

[5]The places which suffer most in this way are hollow places, valleys, the ground near rivers, and, in general, places which are least open to wind; the tree which suffers most is the fig, and next to that the olive. The wild olive, being stronger, suffered more than the cultivated tree, which was surprising. But the almonds were altogether unscathed, as also were the apples pears and pomegranates; wherefore this too was a surprising fact. The tree gets scorched by this wind right down to the trunk, and in general the upper are caught more and earlier than the lower parts.[6] The effects are seen partly at the actual

[5] *cf. C.P.* 5. 12. 7; Plin. 17. 232 and 233.

[6] κάτω UMVP; ἄνω W. after Sch.'s conj.: text probably defective; I have added τὰ ἄνω. *cf. C.P.* 5. 12. 5.

ἡ δὲ ἐλάα διὰ τὸ ἀείφυλλον ὕστερον· ὅσαι μὲν οὖν ἂν φυλλοβολήσωσιν ἀναβιώσκονται πάλιν, ὅσαι δ' ἂν μὴ τελέως ἀπόλλυνται. παρ' ἐνίοις δέ τινες ἀποκαυθεῖσαι καὶ τῶν φύλλων αὐανθέντων ἀνεβλάστησαν πάλιν ἄνευ τοῦ ἀποβαλεῖν καὶ τὰ φύλλα ἀνεβίωσεν. ἐνιαχοῦ δὲ καὶ πολλάκις τοῦτο συμβαίνει, καθάπερ καὶ ἐν Φιλίπποις.

13 Τὰ δ' ἐκπαγέντα, ὅταν μὴ τελέως ἀπόληται, τάχιστα ἀναβλαστάνει, ὥστε εὐθὺς τὴν ἄμπελον καρποφορεῖν, ὥσπερ ἐν Θετταλίᾳ. ἐν δὲ τῷ Πόντῳ περὶ Παντικάπαιον αἱ μὲν ἐκπήξεις γίνονται διχῶς, ὁτὲ μὲν ὑπὸ ψύχους ἐὰν χειμέριον ᾖ τὸ ἔτος, ὁτὲ δὲ ὑπὸ πάγων ἐάν γε πολὺν χρόνον διαμένωσι. ἀμφότερα δὲ μάλιστα γίγνονται μετὰ τροπὰς περὶ τὰς τετταράκοντα. γίνονται δὲ οἱ μὲν πάγοι ταῖς αἰθρίαις, τὰ δὲ ψύχη μάλιστα ὑφ' ὧν ἡ ἔκπηξις ὅταν αἰθρίας οὔσης αἱ λεπίδες καταφέρωνται. ταῦτα δ' ἐστὶν ὥσπερ τὰ ξύσματα πλὴν πλατύτερα, καὶ φερόμενα φανερὰ πεσόντα δὲ οὐ διαμένει· περὶ δὲ τὴν Θρᾴκην ἐκπήγνυνται.

14 Ἀλλὰ γὰρ αἱ μὲν νόσοι πόσαι τε καὶ ποῖαι καὶ τίνες γίνονται καὶ πάλιν αἱ δι' ὑπερβολὴν χειμῶνος ἢ καυμάτων φθοραὶ καὶ αἱ διὰ πνευμάτων ψυχρότητα ἢ θερμότητα διὰ τούτων θεωρείσθωσαν· ὧν ἐνίας οὐθὲν ἂν κωλύοι καὶ τοῖς ἀγρίοις εἶναι κοινὰς καὶ κατὰ τὴν ὅλην τῶν δένδρων φθορὰν καὶ ἔτι μᾶλλον κατὰ τὴν τῶν καρπῶν· ὃ καὶ συμβαῖνον ὁρῶμεν· οὐκ εὐκαρπεῖ

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[1] Plin. 17. 233.
[2] ἐκπαγέντα conj. Sch.; ἐκπλαγέντα U; ἐκπληγέντα Ald.
[3] ἐάν γε conj. Sch.; ἐὰν δὲ U; ἐὰν π. χ. δ. γε Ald.

time of budding, but in the olive, because it is evergreen, they do not appear till later; those trees therefore which have shed their leaves come to life again, but those that have not done so are completely destroyed. In some places trees have been known, after being thus scorched and after their leaves have withered, to shoot again without shedding their leaves, and the leaves have come to life again. Indeed in some places, as at Philippi, this happens several times.

[1] Trees which have been frost-bitten,[2] when they are not completely destroyed, soon shoot again, so that the vine immediately bears fruit, for instance in Thessaly. In Pontus near Panticapaeum the frost-bite occurs in two ways, either just from cold, if the season is wintry, or from long[3] spells of frost; in either case this generally occurs in the[4] forty days after the winter solstice. The frosts occur in fine weather, but the cold spells, which cause the frost-bite, chiefly when in fine weather the 'flakes'[5] fall; these are like filings, but broader, and can be seen as they fall, but when they have fallen, they disappear—though in Thrace they freeze solid.

Let this suffice for consideration of the diseases, their number and nature, including the fatal effects of excessive cold and heat or of cold or hot winds. And it may well be that certain of these also affect wild trees, producing entire destruction of the tree and still more that of the fruit. Indeed we see this actually happen; for wild trees also often fail to

[4] περὶ conj. Sch., *cf. C.P.* 5. 12. 4; μετὰ UMVAld.

[5] λεπίδες conj. Scal. from G (*squammulae*); ῥεπίδες Ald. *cf.* Hdt. 4. 31.

γὰρ οὐδ' ἐκεῖνα πολλάκις, ἀλλ' οὐχ ὁμοίως οἶμαι παρατετήρηται.

XV. Λοιπὸν δ' εἰπεῖν ὅσα παραιρουμένων τινῶν μορίων ἀπόλλυται. κοινὴ μὲν δὴ πᾶσι φθορὰ τοῦ φλοιοῦ περιαιρεθέντος κύκλῳ· πᾶν γὰρ ὡς εἰπεῖν οὕτως ἀπόλλυσθαι δοκεῖ πλὴν ἀνδράχλη· καὶ αὕτη δὲ ἐάν τις τὴν σάρκα σφόδρα πιέσῃ καὶ τὸν μέλλοντα βλαστὸν διακόψῃ· πλὴν εἰ ἄρα φελλοῦ· τοῦτον γάρ φασι καὶ εὐσθενεῖν μᾶλλον περιαιρουμένου δῆλον ὅτι τοῦ ἔξω καὶ τοῦ κάτω πρὸς τῇ σαρκί, καθάπερ καὶ τῆς ἀνδράχλης. ἐπεὶ καὶ τοῦ κεράσου περιαιρεῖται καὶ τῆς ἀμπέλου καὶ τῆς φιλύρας, ἐξ οὗ τὰ σχοινία, καὶ μαλάχης τῶν ἐλαττόνων, ἀλλ' οὐχ ὁ κύριος οὐδ' ὁ πρῶτος, ἀλλ' ὁ ἐπιπολῆς, ὃς καὶ αὐτόματος ἐνίοτε ἀποπίπτει διὰ τὴν ὑπόφυσιν θατέρου.

2 Καὶ γὰρ φλοιορραγῆ ἔνια τῶν δένδρων ἐστίν, ὥσπερ καὶ ἡ ἀνδράχλη καὶ ἡ πλάτανος. ὡς δέ τινες οἴονται, πάλιν ὑποφύεται νέος, ὁ δὲ ἔξωθεν ἀποξηραίνεται καὶ ῥήγνυται καὶ αὐτόματος ἀποπίπτει πολλῶν, ἀλλ' οὐχ ὁμοίως ἐπίδηλος. φθείρονται μὲν οὖν, ὡς οἴονται, πάντα περιαιρουμένου, διαφέρει δὲ τῷ θᾶττον καὶ βραδύτερον καὶ

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[1] Plin. 17. 234 ; *cf. C.P.* 5. 15. 1.
[2] *cf.* 1. 5. 2.
[3] *βλαστὸν* conj. Sch. from G ; *καρπὸν* UAld.H.
[4] Plin. 17. 234–236.

produce a good crop of fruit; but, I imagine, they have not been so well observed.

Of the effects on trees of removing bark, head, heart-wood, roots, etc.; of various causes of death.

XV. [1] Next we must mention what trees perish when certain parts are removed. All perish alike, if the bark is stripped off all round; one may say that every tree, except the andrachne,[2] perishes under these circumstances; and this tree does so also, if one does violence to the flesh, and so breaks off the new growth [3] which is forming. However one should perhaps except the cork-oak; for this, they say, is all the stronger if its bark is stripped off, that is, the outer bark and also that which lies below it next the flesh—as with the andrachne. For the bark is also stripped from the bird-cherry the vine and the lime (and from this the ropes are made), and, among smaller plants, from the mallow; but in these cases it is not the real nor the first bark which is taken, but that which grows above that, which even of its own accord sometimes falls off because fresh bark is forming underneath.

[4] In fact some trees, as andrachne and plane, have a bark which cracks.[5] As some think, in many cases a new bark forms [6] underneath, while the outer bark withers and cracks and in many cases falls off of its own accord; but the process is not so obvious as it is in the above mentioned cases. Wherefore, as they think, all trees are destroyed by stripping the bark, though the destruction is not in all cases equally

[5] *cf. C.P.* 3. 18. 3. *φλοιορραγῆ ἔνια* conj. Mold.; *φλοιορραγία μία* UMV; *φυλλορογία μία* Ald.

[6] *ὑποφύεται* conj. W.; *ὑποφύει* Ald.H.

μᾶλλον καὶ ἧττον. ἔνια γὰρ πλείω χρόνον διαμένει, καθάπερ συκῆ καὶ φίλυρα καὶ δρῦς· οἱ δὲ καὶ ζῆν φασι ταῦτα, ζῆν δὲ καὶ πτελέαν καὶ φοίνικα· τῆς δὲ φιλύρας καὶ συμφύεσθαι τὸν φλοιὸν πλὴν μικροῦ· τῶν δὲ ἄλλων οἷον πωροῦσθαι καὶ ἰδίαν τινὰ φύσιν ἔχειν. βοηθεῖν δὲ πειρῶνται διαπλάττοντες πηλῷ καὶ περιδοῦντες φλοιοῖς καὶ καλάμοις καὶ τοῖς τοιούτοις, ὅπως μὴ ψύχηται μηδ' ἀποξηραίνηται. καὶ ἤδη φασί που ἀναφῦναι, καθάπερ καὶ ἐν Ἡρακλείᾳ τῇ Τραχινίᾳ,
3 τὰς συκᾶς. δεῖ δὲ ἅμα τῇ τῆς χώρας ἀρετῇ καὶ τῇ τοῦ ἀέρος κράσει καὶ τὰ ἐπιγιγνόμενα τοιαῦτα εἶναι· χειμώνων γὰρ ἢ καυμάτων ἐπιγινομένων σφοδρῶν εὐθὺς ἀπόλλυνται· διαφέρουσι δὲ καὶ αἱ ὧραι· περὶ γὰρ τὴν βλάστησιν ἐλάτης ἢ πεύκης, ὅτε καὶ λοπῶσι, τοῦ Θαργηλιῶνος ἢ Σκιρροφοριῶνος ἄν τις περιέλῃ, παραχρῆμα ἀπόλλυται. τοῦ δὲ χειμῶνος πλείω χρόνον ἀντέχει καὶ ἔτι μᾶλλον τὰ ἰσχυρότατα, καθάπερ πρῖνος καὶ δρῦς· χρονιωτέρα γὰρ ἡ τούτων φθορά.
4 δεῖ δὲ καὶ τὴν περιαίρεσιν ἔχειν τι πλάτος, πάντων μὲν μάλιστα δὲ τῶν ἰσχυροτάτων· ἐπεὶ ἄν τις μικρὰν παντελῶς ποιήσῃ, οὐθὲν ἄτοπον τὸ μὴ ἀπόλλυσθαι· καίτοι φασί γέ τινες, ἐὰν ὁπωσονοῦν, συμφθείρεσθαι πάντως· ἀλλ' ἐπὶ τῶν ἀσθενεστέρων τοῦτ' εἰκός. ἔνια γὰρ κἂν μὴ κύκλῳ περιαιρεθῇ φθείρεσθαί φασιν, ἃ καὶ

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[1] καὶ add. W. (text defective in MSS. except U).

rapid or complete. Some in fact, as fig lime and oak, survive for some time; indeed some say that these recover, and also the elm and date-palm, and that the bark even of the lime almost entirely closes up again, while in other trees it forms as it were a callus and[1] acquires a peculiar new character. Men try to help the tree by plastering it with mud and tying pieces of bark reeds or something of the kind about it, so that it may not take cold nor become dried up. And they say that the bark has been known to grow again;[2] for instance that that of the fig-trees at the Trachinian Heraclea did so. However this does not only depend on the quality of the soil and on the climate; the other circumstances which ensue must also be favourable; for, if great cold or heat ensues, the tree perishes at once. The season also makes a difference. For if one strips the bark of a silver-fir or fir at the time when the buds are shooting during Thargelion or Skirrophorion,[3] at which season it is separable, the tree dies at once. If it is done however in winter, the tree holds out longer; and this is especially true of the strongest trees, such as kermes-oak and oak; these it takes longer to kill. However the piece stripped off must be of a certain breadth to cause the death of the tree, especially in the case of the strongest trees; for, if one does it only a little, it is not surprising that the tree should not be killed; though some indeed say that, if it is done at all,[4] the tree certainly dies; this however is probably true only of the weaker kinds. For some, they say, if they are in bad barren

[2] *ἀναφῦναι* conj. Scal. from G; *φῦναι* Ald. H.
[3] May–June.
[4] *ὁπωσοῦν* conj. Sch. from G; *ὁπωσοῦν* Ald.

λυπρὰν ἔχει χώραν καὶ ἄτροφον. αὕτη μὲν δή, καθάπερ εἴρηται, κοινὴ φθορὰ πάντων.

XVI. Ἣν δὲ καλοῦσιν ἐπικοπὴν τῶν δένδρων, μόνου πεύκης ἐλάτης πίτυος φοίνικος, οἱ δὲ καὶ κέδρου καὶ κυπαρίττου φασί. ταῦτα γάρ, ἐὰν περιαιρεθῇ τὴν κόμην ἄνωθεν καὶ ἐπικοπῇ τὸ ἄκρον, φθείρεται πάντα καὶ οὐ βλαστάνει, καθάπερ οὐδ' ἐπικαυθέντα ἢ πάντα ἢ ἔνια. τὰ δ' ἄλλα πάντα καὶ περικοπέντα βλαστάνει, καὶ ἔνιά γε καλλίω γίνεται, καθάπερ ἡ ἐλάα. διαφθείρεται δὲ τὰ πολλὰ κἂν σχισθῇ τὸ στέλεχος· οὐδὲν γὰρ ὑπομένειν δοκεῖ πλὴν ἀμπέλου καὶ συκῆς καὶ ῥόας καὶ μηλέας· ἔνια δὲ κἂν ἑλκωθῇ καὶ μεῖζον καὶ βαθύτερον ἀπόλλυται. τὰ δ' οὐδὲν πάσχει, καθάπερ ἡ πεύκη δᾳδουργουμένη, καὶ ἐξ ὧν δὴ τὰς ῥητίνας συλλέγουσιν, οἷον ἐλάτης τερμίνθου· καὶ γὰρ δὴ τούτων εἰς βάθος ἡ τρῶσις καὶ ἕλκωσις. καὶ γὰρ ἐξ ἀφόρων φοράδες γίνονται καὶ ἐξ ὀλιγοφόρων πολυφόροι.

2 Τὰ δὲ καὶ πελέκησιν ὑπομένει καὶ ὀρθὰ καὶ πεσόντα ὑπὸ πνεύματος, ὥστε πάλιν ἀνίστασθαι καὶ ζῆν καὶ βλαστάνειν, οἷον ἰτέα καὶ πλάτανος. ὅπερ συνέβη καὶ ἐν Ἀντάνδρῳ καὶ ἐν Φιλίπποις· ἐκπεσούσης γὰρ ὡς ἀπέκοψαν τοὺς ἀκρεμόνας καὶ ἐπελέκησαν, ἀνεφύη νύκτωρ ἡ πλάτανος κουφισθεῖσα τοῦ βάρους καὶ ἀνεβίω καὶ ὁ φλοιὸς περιέφυ πάλιν. παραπεπελεκημένη δ' ἐτύγχανεν ἐκ τῶν δύο μερῶν· ἦν δὲ τὸ δένδρον μέγα μῆκος

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[1] Plin. 17. 236; *cf.* 3. 7. 2; *C.P.* 5. 17. 3.
[2] *cf.* 3. 9. 5.
[3] ἄνωθεν καὶ conj. W.: καὶ ἄνωθεν Ald.
[4] *cf.* 1. 3. 3; 1. 14. 2.

soil, die even if the bark is not stripped all round. This then, as has been said, is a universal cause of death.

XVI. [1] The process which is called topping of trees is fatal only to fir silver-fir Aleppo pine[2] and date-palm, though some add prickly cedar and cypress. These, if they are stripped of their foliage at the top[3] and the crown is cut off, perish wholly and do not shoot again, as is the case with some, if not with all, if they are burnt. But all other trees shoot again after being lopped, and some, such as the olive,[4] become all the fairer. However most trees perish if the stem is split;[5] for no tree seems able to stand this, except vine fig pomegranate and apple; and some perish even if they are wounded severely and deeply. Some however take no harm[6] from this, as the fir when it is cut for tar, and those trees from which the resins are collected, as silver-fir and terebinth; though these trees are in fact then deeply wounded and mangled. Indeed they actually become fruitful[7] instead of barren, or are made to bear plentifully instead of scantily.

Some trees again submit to being hewn both when they are standing and when they have been blown down, so that they rise up again and live and shoot, for instance the willow and the plane. [8] This was known to happen in Antandros and at Philippi; a plane in Antandros having fallen and had its boughs lopped off and the axe applied to its trunk, grew again in the night when thus relieved of the weight, and the bark grew about it again. It happened that it had been hewn two thirds of the way round; it

[5] *cf. C.P.* 5. 16. 4; Plin. 17. 238.
[6] *cf. C.P.* 5. 16. 2.
[7] φοράδες conj. Sch.; φορίδες Ald.
[8] Plin. 16. 133.

μὲν μεῖζον ἢ δεκάπηχυ, πάχος δ' ὥστε μὴ ῥᾳδίως
3 ἂν περιλαβεῖν τέτταρας ἄνδρας. ἡ δὲ ἐν Φιλίπποις ἰτέα περιεκόπη μὲν τοὺς ἀκρεμόνας, οὐ μὴν παρεπελεκήθη. μάντις δέ τις ἔπεισεν αὐτοὺς θυσίαν τε ποιεῖσθαι καὶ τηρεῖν τὸ δένδρον ὡς σημεῖον ἀγαθὸν γεγονός. ἀνέστη δὲ καὶ ἐν Σταγείροις ἐν τῷ μουσείῳ λεύκη τις ἐκπεσοῦσα.

4 Τῆς δὲ μήτρας ἐξαιρουμένης οὐθὲν ὡς εἰπεῖν φθείρεται δένδρον. σημεῖον δὲ ὅτι πολλὰ κοῖλα τῶν μέγεθος ἐχόντων δένδρων ἐστίν. οἱ δὲ περὶ Ἀρκαδίαν φασὶ μέχρι τινὸς μὲν ζῆν τὸ δένδρον, τελέως δὲ ἐξ ἅπαντος ἐξαιρεθείσης καὶ πεύκην φθείρεσθαι καὶ ἐλάτην καὶ ἄλλο πᾶν.

5 Κοινὴ δὲ φθορὰ πάντων κἂν αἱ ῥίζαι περικοπῶσιν ἢ πᾶσαι ἢ αἱ πλεῖσται καὶ μέγισται καὶ κυριώταται τοῦ ζῆν. αὗται μὲν οὖν ἐξ ἀφαιρέσεως.

Ἡ δ' ὑπὸ τοῦ ἐλαίου προσθέσει τινὶ μᾶλλον ἢ ἀφαιρέσει· πολέμιον γὰρ δὴ καὶ τοῦτο πᾶσι· καὶ ἔλαιον ἐπιχέουσι τοῖς ὑπολείμμασι τῶν ῥιζῶν. ἰσχύει δὲ μᾶλλον τὸ ἔλαιον ἐν τοῖς νέοις καὶ ἄρτι φυομένοις· ἀσθενέστερα γάρ, δι' ὃ καὶ ἅπτεσθαι κωλύουσι.

Φθοραὶ δὲ καὶ ὑπ' ἀλλήλων εἰσὶ τῷ παραιρεῖσθαι τὰς τροφὰς καὶ ἐν τοῖς ἄλλοις ἐμποδίζειν. χαλεπὸς δὲ καὶ ὁ κιττὸς παραφυόμενος, χαλεπὸς δὲ καὶ ὁ κύτισος· ἀπόλλυσι γὰρ πάνθ' ὡς εἰπεῖν·

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[1] *τινὸς μὲν ζῆν τὸ δ.* conj. W.; *τινος ἐὰν* (corrected) *τοῦ δένδρου* U; *τινος ἐξῃρέθη τοῦ δ.* MVAld.

[2] *cf.* Plin. 17. 234; *C.P.* 5. 15. 6.

[3] *πᾶσι· καὶ ἔλαιον ἐπιχέουσι* conj. Sch.; *πᾶσιν ἔλαιον ἐπιχεύουσιν* UMP_2Ald.

was a large tree, more than ten cubits high, and of such girth that four men could not easily have encircled it. The willow at Philippi which grew again had had its branches lopped off, but the trunk had not been hewn. A certain seer persuaded the people to offer sacrifice and take care of the tree, since what had occurred was a good omen. Also at Stageira an abele in the school gardens which had fallen got up again.

Hardly any tree is destroyed by taking out the core; a proof of which is the fact that many large trees are hollow. The people of Arcadia say that the tree under these circumstances lives for a time,[1] but that, if the tree is entirely deprived of its core, fir or silver-fir or any other tree perishes.

All trees alike are destroyed when the roots are cut off, whether all or most of them, if those removed are the largest and the most essential to life. Such then are the causes of death which come from the removal of a part of the tree.

On the other hand the destruction which oil[2] causes is due rather to a kind of addition than to removal; for oil is hostile to all trees, and[3] so men pour it[4] over what remains of the roots. However oil is more potent with young trees which are just growing; for then they are weaker; wherefore men do not allow them to be touched at that time.

[5] Again trees may destroy one another, by robbing them of nourishment and hindering them in other ways. Again an overgrowth of ivy[6] is dangerous,[7] and so is tree-medick, for this destroys almost any-

[4] *i.e.* to complete the destruction of a tree. *cf.* Plut. *Quaest. Conv.* 2. 6. 2.

[5] Plin. 17. 239 and 240. [6] *cf. C.P.* 5. 15. 4.

[7] χαλεπὸς δὲ καὶ Ald.; χαλεπὸς δ' ἐστὶν conj. W.

ἰσχυρότερον δὲ τούτου τὸ ἄλιμον· ἀπόλλυσι γὰρ τὸν κύτισον.

6 Ἔνια δὲ οὐ φθείρει μὲν χείρω δὲ ποιεῖ ταῖς δυνάμεσι τῶν χυλῶν καὶ τῶν ὀσμῶν, οἷον ἡ ῥάφανος καὶ ἡ δάφνη τὴν ἄμπελον. ὀσφραίνεσθαι γάρ φασι καὶ ἕλκειν.[1] δι' ὃ καὶ ὅταν ὁ βλαστὸς πλησίον[2] γένηται πάλιν ἀναστρέφειν καὶ ἀφορᾶν ὡς πολεμίας οὔσης τῆς ὀσμῆς. Ἀνδροκύδης δὲ καὶ παραδείγματι τούτῳ κατεχρήσατο πρὸς τὴν βοήθειαν τὴν ἀπὸ τῆς ῥαφάνου γινομένην πρὸς τὸν οἶνον, ὡς ἐξελαύνουσαν τὴν μέθην· φεύγειν γὰρ δὴ καὶ ζῶσαν τὴν ἄμπελον τὴν ὀσμήν. αἱ μὲν οὖν φθοραὶ πῶς τε γίνονται καὶ πόσαι καὶ ποσαχῶς φανερὸν ἐκ τῶν προειρημένων.

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[1] ἕλκει : lit. 'draws it in'; *cf.* ἕλκειν ἀέρα, μέθυ, etc.

[2] *cf. C.P.* 2. 18. 4. ὁ βλαστὸς πλησίον conj. Dalec. from G ; ὁ πλησίον βλαστός Ald.H.

thing. But *halimon* is more potent even than this, for it destroys tree-medick.

Again some things, though they do not cause death, enfeeble the tree as to the production of flavours and scents; thus cabbage and sweet bay have this effect on the vine. For they say that the vine scents the cabbage and is infected[1] by it. Wherefore the vine-shoot,[2] whenever it comes near this plant, turns back and looks away,[3] as though the smell were hostile to it. Indeed Androkydes[4] used this fact as an example to demonstrate the use of cabbage against wine, to expel the fumes of drunkenness; for,[5] said he, even when it is alive, the vine avoids the smell. It is now clear from what has been said how the death of a tree may be caused, how many are the causes of death, and in what several ways they operate.

[3] ἀφορᾶν conj. Sch.; εὐφορεῖν U; ἀφορεῖν Ald.; *averti* G; *recedere* Plin. *l.c.*; ἐκχωρεῖν conj. W.

[4] A medical man who preached temperance to Alexander; *cf.* Plin. 14. 58; 17. 240.

[5] γὰρ δὴ καὶ conj. Dalec. from G; γὰρ δεῖ καὶ Ald.

BOOK V

E

I. Περὶ δὲ τῆς ὕλης, ποία τέ ἐστιν ἑκάστη, καὶ πόθ' ὡραία τέμνεσθαι, καὶ πρὸς ποῖα τῶν ἔργων χρησίμη, καὶ ποία δύσεργος ἢ εὔεργος, καὶ εἴ τι ἄλλο τῆς τοιαύτης ἱστορίας ἔχεται, πειρατέον ὁμοίως εἰπεῖν.

Ὡραῖα δὴ τέμνεσθαι τῶν ξύλων τὰ μὲν οὖν στρογγύλα καὶ ὅσα πρὸς φλοϊσμὸν ὅταν βλαστάνῃ· τότε γὰρ εὐπεριαίρετος ὁ φλοιός, ὃ δὴ καλοῦσι λοπᾶν, διὰ τὴν ὑγρότητα τὴν ὑπογινομένην αὐτῷ. μετὰ δὲ ταῦτα δυσπεριαίρετος καὶ τὸ ξύλον μέλαν γίνεται καὶ δυσειδές. τὰ δὲ τετράγωνα μετὰ τὸν λοπητόν· ἀφαιρεῖται γὰρ ἡ πελέκησις τὴν δυσείδειαν. ὅλως πᾶν πρὸς ἰσχὺν ὡραιότατον οὐ μόνον πεπαυμένον τῆς βλαστήσεως ἀλλ' ἔτι μᾶλλον ἐκπεπᾶναν τὸν καρπόν. ἀλλὰ διὰ τὸν φλοϊσμὸν ἀώροις οὖσιν ὡραίοις συμβαίνει γίνεσθαι τοῖς στρογγύλοις, ὥστε ἐναντίαι αἱ ὧραι κατὰ συμβεβηκός. εὐ-

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[1] Plin. 16. 188. [2] *cf.* 3. 5. 1.

[3] δυσπεριαιρετός conj. Sch.; δυσπερικάθαρτος Ald.

BOOK V

Of the Timber of various Trees and its Uses.

I. In like manner we must endeavour to speak of timber, saying of what nature is that of each tree, what is the right season for cutting it, which kinds are hard or easy to work, and anything else that belongs to such an enquiry.

Of the seasons of cutting.

[1] Now these are the right seasons for cutting timber:—for 'round' timber and that whose bark is to be stripped the time is when the tree is coming into leaf. For then the bark is easily stripped (which process they call 'peeling'[2]) because of the moisture which forms beneath it. At a later time it is hard to strip,[3] and the timber obtained is black and uncomely. However square logs can be cut after the time of peeling, since trimming with the axe removes the uncomeliness. In general any wood is at the best season as to strength when it has not merely ceased coming into leaf, but has even ripened its fruit; however on account of the bark-stripping it comes to pass that 'round' timber is in season[4] when it is cut before it is ripe, so that, as it happens, the seasons are here reversed. Moreover the wood

[4] *i.e.* in practice the timber is cut before the ideally proper time.

χρούστερα δὲ τὰ ἐλάτινα γίνεται κατὰ τὸν πρῶτον λοπητόν.

2 Ἐπεὶ δὲ μάλιστ' ἢ μόνον περιαιροῦσι τὸν φλοιὸν ἐλάτης πεύκης πίτυος, ταῦτα μὲν τέμνεται τοῦ ἦρος· τότε γὰρ ἡ βλάστησις· τὰ δὲ ἄλλα ὁτὲ μὲν μετὰ πυροτομίαν, ὁτὲ δὲ μετὰ τρυγητὸν καὶ Ἀρκτοῦρον, οἷον ἀρία πτελέα σφένδαμνος μελία ζυγία ὀξύα φίλυρα φηγός τε καὶ ὅλως ὅσα κατορύττεται· δρῦς δὲ ὀψιαίτατα κατὰ χειμῶνα μετὰ τὸ μετόπωρον· ἐὰν δὲ ὑπὸ τὸν λοπητὸν τμηθῇ, σήπεται τάχιστα ὡς εἰπεῖν, ἐάν τε ἔμφλοιος ἐάν τε ἄφλοιος· καὶ μάλιστα μὲν τὰ ἐν τῷ πρώτῳ λοπητῷ, δεύτερα δὲ τὰ ἐν τῷ δευτέρῳ, τρίτα δὲ καὶ ἥκιστα τὰ ἐν τῷ τρίτῳ· τὰ δὲ μετὰ τὴν πέπανσιν τῶν καρπῶν ἄβρωτα διαμένει, κἂν ἀλόπιστα ᾖ· πλὴν ὑπὸ τὸν φλοιὸν ὑποδυόμενοι σκώληκες ἐπιπολῆς ἐγγράφουσι τὸ στέλεχος, οἷς καὶ σφραγῖσι χρῶνταί τινες· ὡραῖον δὲ τμηθὲν τὸ δρύϊνον ἀσαπές τε καὶ ἀθριπηδέστατον γίνεται καὶ σκληρὸν καὶ πυκνὸν ὥσπερ κέρας· πᾶν γὰρ ὅμοιόν ἐστιν ἐγκαρδίῳ· πλὴν τό γε τῆς ἁλιφλοίου καὶ τότε φαῦλον.

3 Συμβαίνει δὲ καὶ τοῦτο ὑπεναντίον, ὅταν τε κατὰ τὴν βλάστησιν τέμνωνται καὶ ὅταν μετὰ τοὺς καρπούς. τότε μὲν γὰρ ἀναξηραίνεται τὰ στελέχη καὶ οὐ βλαστάνει τὰ δένδρα· μετὰ δὲ τοὺς καρποὺς παραβλαστάνει. δυστομώτερα δὲ

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[1] *cf.* 3. 5. 1. [2] ἢ add. Sch.

[3] *φηγός τε* conj. Scal.; *πηγός τε* U; *φηγόσιν τε* V; *πηγόσιν τε* MAld.

[4] *κατορύττεται* conj. Sch. from G; *ὀρύττεται* Ald. *cf.* 5. 4. 3; 5. 7. 5. [5] Plin. 16. 189.

of the silver-fir is of a better colour at the time[1] of the first peeling.

But since they strip the bark of[2] hardly any trees except silver-fir fir and pine, these trees are cut in the spring; for then is the time of coming into leaf. Other trees are cut sometimes after wheat-harvest, sometimes after the vintage and the rising of Arcturus, as *aria* (holm-oak) elm maple manna-ash *zygia* beech lime Valonia oak,[3] and in general all those whose timber is for underground use.[4] The oak is cut latest of all, in early winter at the end of autumn. [5] If it is cut at the time of peeling, it rots almost more quickly than at any other time, whether it has the bark on or not. This is especially so if it is cut during the first peeling, less so during the second, and least during the third. What is cut after the ripening of the fruit remains untouched by worms, even if it has not peeled: however worms get in under the bark and mark the surface of the stem, and such marked pieces of wood some use as seals.[6] Oak-wood if cut in the right season does not rot and is remarkably free from worms, and its texture is hard and close like horn; for it is like the heart of a tree throughout, except that that of the kind called sea-bark oak is even at that time of poor quality.[7]

Again, if the trees are cut at the time of coming into leaf, the result is the opposite of that which follows when they are cut after fruiting: for in the former case the trunks dry up and the trees do not sprout into leaf,[8] whereas after the time of fruiting they sprout at the sides. At this season however

[6] *cf.* Ar. *Thesm.* 427: *θριπήδεστα σφραγίδια.*
[7] *cf.* 3. 8. 5.
[8] *βλαστάνει* M; *παραβλαστάνει* W. with Ald.

διὰ τὴν σκληρότητα κατὰ ταύτην τὴν ὥραν. κελεύουσι δὲ καὶ δεδυκυίας τῆς σελήνης τέμνειν ὡς σκληροτέρων καὶ ἀσαπεστέρων γινομένων. ἐπεὶ δὲ αἱ πέψεις τῶν καρπῶν παραλλάττουσι, δῆλον ὅτι καὶ αἱ ἀκμαὶ πρὸς τὴν τομὴν παραλλάττουσιν· ἀεὶ γὰρ ὀψιαίτεραι αἱ τῶν ὀψικαρ-
4 ποτέρων. δι' ὃ καὶ πειρῶνταί τινες ὁρίζειν καθ' ἑκάστην· οἷον πεύκην μὲν καὶ ἐλάτην ὅταν ὑπολοπῶσιν· ἔτι δὲ ὀξύαν καὶ φίλυραν καὶ σφένδαμνον καὶ ζυγίαν τῆς ὀπώρας· δρῦν δέ, ὥσπερ εἴρηται, μετὰ τὸ φθινόπωρον. φασὶ δέ τινες πεύκην ὡραίαν εἶναι τοῦ ἦρος, ὅταν γε ἔχῃ τὴν καλουμένην κάχρυν, καὶ τὴν πίτυν ὅταν ὁ βότρυς αὐτῆς ἀνθῇ. ποῖα μὲν οὖν ὡραῖα καθ' ἕκαστον χρόνον οὕτω διαιροῦνται. πάντων δὲ δῆλον ὅτι βελτίω τὰ τῶν ἀκμαζόντων δένδρων ἢ τῶν νέων κομιδῇ καὶ γεγηρακότων· τὰ μὲν γὰρ ὑδατώδη, τὰ δὲ γεώδη.

5 Πλείστας δὲ χρείας καὶ μεγίστας ἡ ἐλάτη καὶ ἡ πεύκη παρέχονται, καὶ ταῦτα κάλλιστα καὶ μέγιστα τῶν ξύλων ἐστί. διαφέρουσι δὲ ἀλλήλων ἐν πολλοῖς· ἡ μὲν γὰρ πεύκη σαρκωδεστέρα τε καὶ ὀλιγόϊνος· ἡ δ' ἐλάτη καὶ πολύϊνος καὶ ἄσαρκος, ὥστε ἐναντίως ἑκάτερον ἔχειν τῶν μερῶν, τὰς μὲν ἶνας ἰσχυρὰς τὴν δὲ σάρκα

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[1] αἱ add. Sch.

[2] ὑπολοπῶσιν conj. Sch.; εἰ πέλειν εἰσι U; ὑπελειπεισιν MV; ὑπελινῶσιν Ald.

[3] ταύτην conj. St.; καὶ τὴν Ald.H.

they are harder to cut because the wood is tougher. It is also recommended to do the cutting when the moon has set, since then the wood is harder and less likely to rot. But, since the times when the fruit ripens are different for different trees, it is clear that the right moment for cutting also differs, being later for those[1] trees which fruit later. Wherefore some try to define the time for the cutting of each tree; for instance for fir and silver-fir the time is, they say, when they begin to peel[2]: for beech lime maple and *zygia* in autumn; for oak,[3] as has been said, when autumn is past. Some however say that the fir is ripe for cutting in spring, when it has on it the thing called 'catkin,'[4] and the pine when its 'cluster'[5] is in bloom. Thus they distinguish which trees are ripe for cutting at various times; however it is clear that in all cases the wood is better when the tree is in its prime than when it is quite young or has grown old, the wood of quite young trees being too succulent, and that of old ones too full of mineral matter.

Of the wood of silver-fir and fir.

Silver-fir and fir are the most useful trees and in the greatest variety of ways, and their[6] timber is the fairest and largest. Yet they differ from one another in many respects; the fir is fleshier and has few fibres, while the silver-fir has many fibres and is not fleshy, so that in respect of each component it is the reverse of the other, having stout fibres[7] but soft

[4] *cf.* 1. 1. 2 n.; 3. 5. 5.
[5] *i.e.* the male inflorescence.
[6] ταῦτα conj. Sch. from G; αὐτὰ Ald.H.
[7] *cf.* 3. 9. 7; Plin. 16. 184.

μαλακὴν καὶ μανήν· δι' ὃ τὸ μὲν βάρυ τὸ δὲ κοῦφον· τὸ μὲν γὰρ ἔνδαδον τὸ δὲ ἄδαδον, ᾗ καὶ
6 λευκότερον. ἔχει δὲ καὶ ὄζους πλείους μὲν ἡ πεύκη, σκληροτέρους δὲ ἡ ἐλάτη πολλῷ, μᾶλλον δὲ καὶ σκληροτάτους πάντων· ἄμφω δὲ πυκνοὺς καὶ κερατώδεις καὶ τῷ χρώματι ξανθοὺς καὶ δαδώδεις. ὅταν δὲ τμηθῶσι, ῥεῖ καὶ ἐκ τῶν τῆς ἐλάτης καὶ ἐκ τῶν τῆς πεύκης ἐπὶ πολὺν χρόνον ὑγρότης καὶ μᾶλλον ἐκ τῶν τῆς ἐλάτης. ἔστι δὲ καὶ πολύλοπον ἡ ἐλάτη, καθάπερ καὶ τὸ κρόμυον· ἀεὶ γὰρ ἔχει τινὰ ὑποκάτω τοῦ φαινομένου, καὶ
7 ἐκ τοιούτων ἡ ὅλη. δι' ὃ καὶ τὰς κώπας ξύοντες ἀφαιρεῖν πειρῶνται καθ' ἕνα καὶ ὁμαλῶς· ἐὰν γὰρ οὕτως ἀφαιρῶσιν, ἰσχυρὸς ὁ κωπεών, ἐὰν δὲ παραλλάξωσι καὶ μὴ κατασπῶσιν ὁμοίως, ἀσθενής· πληγὴ γὰρ οὕτως, ἐκείνως δ' ἀφαίρεσις. ἔστι δὲ καὶ μακρότατον ἡ ἐλάτη καὶ ὀρθοφυέστατον. δι' ὃ καὶ τὰς κεραίας καὶ τοὺς ἱστοὺς ἐκ ταύτης ποιοῦσιν. ἔχει δὲ καὶ τὰς φλέβας καὶ τὰς ἶνας
8 ἐμφανεστάτας πάντων. αὐξάνεται δὲ πρῶτον εἰς μῆκος, ἄχρι οὗ δὴ ἐφίκηται τοῦ ἡλίου· καὶ οὔτε ὄζος οὐδεὶς οὔτε παραβλάστησις οὔτε πάχος γίνεται· μετὰ δὲ ταῦτα εἰς βάθος καὶ πάχος· οὕτως αἱ τῶν ὄζων ἐκφύσεις καὶ παραβλαστήσεις.

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[1] τὸ μὲν γὰρ ἐνδ. conj. St. from G; ἐνδ. γὰρ Ald.
[2] *cf.* 3. 9. 7.
[3] *cf.* 3. 9. 7, μόνον οὐ διαφανεῖς, whence it appears that the epithet refers to colour.
[4] Plin. 16. 195. [5] *i.e.* the annual rings. *cf.* 1. 5. 2; 5. 5. 3.
[6] *cf.* Hom. *Od.* 12. 172.
[7] κατασπῶσιν conj. W.; κατὰ πᾶσιν UMV; κατὰ πάντα Ald.
[8] *cf.* Plin. *l.c.* [9] *cf.* 1. 2. 1.
[10] ἐμφανέστατας conj. W.; εὐγενεστάτας Ald.
[11] δὲ conj. Sch.; καὶ UAld. H.

flesh of open texture. Wherefore the timber of the one is heavy, of the other light, the one[1] being resinous, the other without resin; wherefore also it is whiter. Moreover the fir has more branches, but those of the silver-fir are much tougher, or rather they are tougher than those of any other tree; [2] the branches of both however are of close texture, horny,[3] and in colour brown and like resin-glutted wood. [4] When the branches of either tree are cut, sap streams from them for a considerable time, but especially from those of the silver-fir. Moreover the wood of the silver-fir has many layers, like an onion: [5] there is always another beneath that which is visible, and the wood is composed of such layers throughout. Wherefore, when men are shaving this wood to make oars,[6] they endeavour to take off the several coats one by one evenly: for, if they do this, they get a strong spar, while if they do the work irregularly and do not strip[7] off the coats evenly, they get a weak one; for the process in this case is hacking instead of stripping. The silver-fir also gives timber of the greatest lengths and of the straightest growth; wherefore yard-arms[8] and masts are made from it. Also the vessels[9] and fibre are more clearly[10] seen in it than in any other tree. At first[11] it grows in height only, until it has reached[12] the sunshine; and so far there is no branch nor sidegrowth nor density of habit; but after that the tree proceeds to increase in bulk[13] and density of habit, as[14] the outgrowing branches and sidegrowths develop.

[12] ἄχρι . . . ἐφίκηται conj. Sch.; ἄχρι οὗ δὴ κἀφίκηται U; ἵχρις οὐκ ἀφίκηται MV; ἄχρις οὗ ἀχίκηται Ald.H.

[13] *cf.* 4. 1. 4.

[14] Lit. 'this being the effect of the outgrowth.' πάχος· οὕτως Ald.; πάχος, ὅταν conj. W.

9 Ταῦτα μὲν οὖν ἴδια τῆς ἐλάτης, τὰ δὲ κοινὰ καὶ πεύκης καὶ ἐλάτης καὶ τῶν ἄλλων. ἔστι γὰρ ἡ μὲν τετράξοος ἡ δὲ δίξοος. καλοῦσι δὲ τετραξόους μὲν ὅσαις ἐφ' ἑκάτερα τῆς ἐντεριώνης δύο κτηδόνες εἰσὶν ἐναντίαν ἔχουσαι τὴν φύσιν· ἔπειτα καθ' ἑκατέραν τὴν κτηδόνα ποιοῦνται τὴν πελέκησιν ἐναντίας τὰς πληγὰς κατὰ κτηδόνα φέροντες, ὅταν ἐφ' ἑκάτερα τῆς ἐντεριώνης ἡ πελέκησις ἀναστρέφῃ. τοῦτο γὰρ ἐξ ἀνάγκης συμβαίνει διὰ τὴν φύσιν τῶν κτηδόνων. τὰς δὲ τοιαύτας ἐλάτας καὶ πεύκας τετραξόους καλοῦσι. εἰσὶ δὲ καὶ πρὸς τὰς ἐργασίας αὗται κάλλισται· πυκνότατα γὰρ ἔχουσι τὰ ξύλα καὶ τὰς αἰγίδας αὗται
10 φύουσιν. αἱ δίξοοι δὲ κτηδόνα μὲν ἔχουσι μίαν ἐφ' ἑκάτερα τῆς ἐντεριώνης, ταύτας δὲ ἐναντίας ἀλλήλαις, ὥστε καὶ τὴν πελέκησιν εἶναι διπλῆν, μίαν καθ' ἑκατέραν κτηδόνα ταῖς πληγαῖς ἐναντίαις· ἀπαλώτατα μὲν οὖν ταῦτά φασιν ἔχειν τὰ ξύλα, χείριστα δὲ πρὸς τὰς ἐργασίας· διαστρέφεται γὰρ μάλιστα. μονοξόους δὲ καλοῦσι τὰς ἐχούσας μίαν μόνον κτηδόνα· τὴν δὲ πελέκησιν αὐτῶν γίνεσθαι τὴν αὐτὴν ἐφ' ἑκάτερα τῆς ἐντεριώνης· φασὶ δὲ μανότατα μὲν ἔχειν τῇ φύσει τὰ ξύλα ταῦτα πρὸς δὲ τὰς διαστροφὰς ἀσφαλέστατα.

11 Διαφορὰς δὲ ἔχουσι τοῖς φλοιοῖς, καθ' ἃς γνωρίζουσιν ἰδόντες εὐθὺς τὸ δένδρον πεφυκὸς

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[1] Plin. *l.c.*

[2] The meaning of 'four-cleft' etc. seems to be this:



These are the characteristics peculiar to the silver-fir. Others it shares with the fir and the other trees of this class. [1] For instance, sometimes a tree is 'four-cleft,' sometimes 'two-cleft'; it is called 'four-cleft' when on either side of the heart-wood there are two distinct and diverse lines of fissure: in that case the blows of the axe follow these lines in cases where the hewing is stopped short on either side of the heart-wood.[2] For the nature of the lines of fissure compels the hewing to take this course. Silver-firs or firs thus formed are said to be 'four-cleft.' And these are also the fairest trees for carpentry, their wood being the closest and possessing the *aigis*.[3] Those which are 'two-cleft' have one single line of fissure on either side of the heart-wood, and the lines of fissure do not correspond to each other, so that the hewing also is performed by cuts which follow the two lines of fissure, so as to reach the two sides of the heart-wood at different angles. Now such wood, they say, is the softest, but the worst for carpentry, as it warps most easily. Those trees which have only a single[4] continuous line of fissure are said to be 'one-cleft,' though here too the cutting is done from either side of the heart-wood: and such wood has, they say, an open[5] texture, and yet[6] it is not at all apt to warp.

[7] There are also differences in the bark, by observation of which they can tell at once what the

[3] *cf.* 3. 9. 3. [4] *μίαν* conj. W.; *μίαν δὲ* P_2Ald.
[5] *μανότατα* conj. W.; *μανότητα* Ald.
[6] *τὰ ξύλα . . . τὰς* conj. Sch.; *τὰ ξύλα· ταῦτα δὲ πρὸς τὰς* Ald.H. [7] Plin. 16. 195 and 196.

ποιόν τί ἐστι· τῶν μὲν γὰρ εὐκτηδόνων καὶ ἀστραβῶν καὶ ὁ φλοιὸς λεῖος καὶ ὀρθός, τῶν δ' ἐναντίων τραχύς τε καὶ διεστραμμένος· ὁμοίως δὲ καὶ ἐπὶ τῶν λοιπῶν. ἀλλ' ἔστι τετράξοα μὲν ὀλίγα μονόξοα δὲ πλείω τῶν ἄλλων. ἅπασα δὲ ἡ ὕλη μείζων καὶ ὀρθοτέρα καὶ ἀστραβεστέρα καὶ στιφροτέρα καὶ ὅλως καλλίων καὶ πλείων ἡ ἐν τοῖς προσβορείοις, ὥσπερ καὶ πρότερον ἐλέχθη· καὶ αὐτοῦ τοῦ δένδρου δὲ τὰ πρὸς βορρᾶν πυκνότερα καὶ νεανικώτερα. ὅσα δὲ ὑποπαράβορρα καὶ ἐν περίπνῳ, ταῦτα στρέφει καὶ παραλλάττει παρὰ μικρὸν ὁ βορέας, ὥστε εἶναι παρεστραμμένην αὐτῶν τὴν μήτραν καὶ
12 οὐ κατ' ὀρθόν. ἔστι δὲ ὅλα μὲν τὰ τοιαῦτα ἰσχυρὰ τμηθέντα δὲ ἀσθενῆ διὰ τὸ πολλὰς ἔχειν παραλλαγάς. καλοῦσι δὲ οἱ τέκτονες ἐπίτομα ταῦτα διὰ τὸ πρὸς τὴν χρείαν οὕτω τέμνειν. ὅλως δὲ χείρω τὰ ἐκ τῶν ἐφύγρων καὶ εὐδιεινῶν καὶ παλισκίων καὶ συνηρεφῶν καὶ πρὸς τὴν τεκτονικὴν χρείαν καὶ πρὸς τὴν πυρευτικήν. αἱ μὲν οὖν τοιαῦται διαφοραὶ πρὸς τοὺς τόπους εἰσὶν αὐτῶν τῶν ὁμογενῶν ὡς γε ἁπλῶς εἰπεῖν.

II. Διαιροῦσι γάρ τινες κατὰ τὰς χώρας, καί φασιν ἀρίστην μὲν εἶναι τῆς ὕλης πρὸς τὴν τεκτονικὴν χρείαν τῆς εἰς τὴν Ἑλλάδα παραγινομένης τὴν Μακεδονικήν· λεία τε γάρ ἐστι καὶ ἀστραβὴς καὶ ἔχουσα θυΐον. δευτέραν δὲ τὴν Ποντικήν, τρίτην δὲ τὴν ἀπὸ τοῦ Ῥυνδάκου,

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[1] πεφυκὸς : *cf.* Xen. *Cyr.* 4. 3. 5.

[2] ὑποπαράβορρα conj. St.; ὑπὸ παράβορρα Ald.; ὑπόβορρα ἢ παράβορρα conj. Sch.

timber of the tree is like as it stands.[1] For if the timber has straight and not crooked lines of fissure, the bark also is smooth and regular, while if the timber has the opposite character, the bark is rough and twisted; and so too is it with other points. However few trees are 'four-cleft,' and most of those which are not are 'one-cleft.' All wood, as was said before, which grows in a position facing north, is bigger, more erect, of straighter grain, tougher, and in general fairer and more abundant. Moreover of an individual tree the wood on the northward side is closer and more vigorous. But if a tree stands sideways to the north[2] with a draught round it, the north wind by degrees twists and contorts[3] it, so that its core becomes twisted instead of running straight. The timber of such a tree while still in one piece is strong, but, when cut, it is weak, because the grain slants across the several pieces. Carpenters call such wood 'short lengths,' because they thus cut it up for use. Again in general wood which comes from a moist, sheltered, shady or confined position is inferior both for carpentry and for fuel. Such are the differences, generally[4] speaking, between trees of the same kind as they are affected by situation.

Of the effects on timber of climate.

II. [5]Some indeed make a distinction between regions and say that the best of the timber which comes into Hellas for the carpenter's purposes is the Macedonian, for it is smooth and of straight grain, and it contains resin: second best is that from Pontus, third that

[1] παραλλάττει conj. Dalec.; παραλλάγει U; παραλήγει Ald.; παραλυγίζει conj. H. Steph.
[2] γε conj. Sch.; δὲ Ald. [5] Plin. 16. 197.

τετάρτην δὲ τὴν Αἰνιανικήν· χειρίστην δὲ τήν τ
Παρνασιακὴν καὶ τὴν Εὐβοϊκήν· καὶ γὰρ ὀζώδει
καὶ τραχείας καὶ ταχὺ σήπεσθαι. περὶ δὲ τῆ
Ἀρκαδικῆς σκεπτέον.

2 Ἰσχυρότατα δὲ τῶν ξύλων ἐστὶ τὰ ἄοζα κα
λεῖα· καὶ τῇ ὄψει δὲ ταῦτα κάλλιστα. ὀζώδη
δὲ γίνεται τὰ κακοτροφηθέντα καὶ ἤτοι χειμῶν
πιεσθέντα ἢ καὶ ἄλλῳ τινὶ τοιούτῳ· τὸ γὰρ
ὅλον τὴν πολυοζίαν εἶναι ἔνδειαν εὐτροφίας
ὅταν δὲ κακοτροφήσαντα ἀναλάβῃ πάλιν καὶ εὐ
σθενήσῃ, συμβαίνει καταπίνεσθαι τοὺς ὄζου
ὑπὸ τῆς περιφύσεως· εὐτροφοῦν γὰρ καὶ αὐ
ξανόμενον ἀναλαμβάνει καὶ πολλάκις ἔξωθε
μὲν λεῖον τὸ ξύλον διαιρούμενον δὲ ὀζῶδε
ἐφάνη. δι' ὃ καὶ σκοποῦνται τῶν σχιστῶν τὰ
μήτρας· ἐὰν γὰρ αὗται ἔχωσιν ὄζους, ὀζώδη κα
τὰ ἐκτός· καὶ οὗτοι χαλεπώτεροι τῶν ἐκτὸς κα
φανεροί.

3 Γίνονται δὲ καὶ αἱ σπεῖραι διὰ χειμῶνας τ
καὶ κακοτροφίαν. σπείρας δὲ καλοῦσιν ὅταν
συστροφή τις ἐν αὐτῇ μείζων καὶ κύκλοις περι
εχομένη πλείοσιν οὔθ' ὥσπερ ὁ ὄζος ἁπλῶς οὔθ
ὡς ἡ οὐλότης ἡ ἐν αὐτῷ τῷ ξύλῳ· δι' ὅλου γάρ
πως αὕτη καὶ ὁμαλίζουσα· χαλεπώτερον δὲ
τοῦτο πολὺ καὶ δυσεργότερον τῶν ὄζων. ἔοικε
δὲ παραπλησίως καὶ ὡς ἐν τοῖς λίθοις ἐγγίνεσθα

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[1] A river which flows into the Propontis on the Asiatic side.

[2] Near Mount Oeta. Αἰνιανικήν conj. Palm. from Plin *l.c.*; αἰανικὴν P_2Ald.H.

[3] ταῦτα κάλλιστα· ὀζώδη δὲ conj. Scal.; ταῦτα καὶ μάλιστα ὀζώδη γίν. Ald.H.; ταῦτα μάλιστα· ὀζώδη δὲ γίν. U.

from the Rhyndakos,[1] fourth that of the country of the Ainianes,[2] worst is that of Parnassus and that of Euboea, for it is full of knots and rough and quickly rots. As to Arcadian timber the case is doubtful.

Of knots and 'coiling' in timber.

The strongest wood is that which is without knots and smooth, and it is also the fairest in appearance.[3] Wood becomes knotty when it has been ill nourished and has suffered severely whether from winter or some such cause; for in general a knotty habit is supposed to indicate lack of nourishment. When however, after being ill nourished, the tree recovers and becomes vigorous, the result is that the knots are absorbed[4] by the growth which now covers them; for the tree, being now well fed and growing vigorously, recovers, and often the wood is smooth outside, though when split it is seen to have knots. And this is why they examine the core of wood that has been split; for, if this contains knots, the outward[5] parts will also be knotty, and these knots are harder to deal with than the outer ones, and are easily recognised.

[6]'Coiling' of the wood is also due to winter or ill nourishment. Wood is said to 'coil' when there is in it closer twisting[7] than usual, made up of an unusual number of rings: this is not quite like a knot, nor is it like the ordinary curling of the wood, which runs right through it and is uniform. 'Coiling' is much more troublesome and difficult to deal with than knots; it seems to correspond to the so-called

[1] *καταxίνεσθαι*: ? *καταλαμβάνεσθαι*. *cf.* below, § 3.
[5] *i.e.* outward in regard to the core. [6] Plin. 16. 198.
[7] *ἡ συατροφή* conj. Scal.; *ἡ εὐατροφή* U; *ἡ εὐτραφῆ* Ald. etc.

τὰ καλούμενα κέντρα. ὅτι δ' ἡ περίφυσις κατα
λαμβάνει τοὺς ὄζους φανερώτατον ἐξ αὐτῆς τῆ
αἰσθήσεως, οὐ μὴν ἀλλὰ καὶ ἐκ τῶν ἄλλω
4 τῶν ὁμοίων· πολλάκις γὰρ αὐτοῦ τοῦ δένδρο
μέρος τι συνελήφθη ὑπὸ θατέρου συμφυοὺς γενο
μένου· καὶ ἐάν τις ἐκγλύψας θῇ λίθον εἰς τ
δένδρον ἢ καὶ ἄλλο τι τοιοῦτον, κατακρύπτετα
περιληφθὲν ὑπὸ τῆς περιφύσεως· ὅπερ καὶ περ
τὸν κότινον συνέβη τὸν ἐν Μεγάροις τὸν ἐν τ
ἀγορᾷ· οὗ καὶ ἐκκοπέντος λόγιον ἦν ἁλῶναι κα
διαρπασθῆναι τὴν πόλιν· ὅπερ ἐγένετο . . .
Δημήτριος. ἐν τούτῳ γὰρ διασχιζομένῳ κνη
μῖδες εὑρέθησαν καὶ ἄλλ' ἄττα τῆς Ἀττικῆ
ἐργασίας κρεμαστά, τοῦ κοτίνου οὗ ἀνετέθη τ
πρῶτον ἐγκοιλανθέντος. τούτου δ' ἔτι μικρὸ
τὸ λοιπόν. πολλαχοῦ δὲ καὶ ἄλλοθι γίνετα
πλείονα τοιαῦτα. καὶ ταῦτα μέν, ὥσπερ εἴρηται
κοινὰ πλειόνων.

III. Κατὰ δὲ τὰς ἰδίας ἑκάστου φύσεις α
τοιαῦταί εἰσι διαφοραί, οἷον πυκνότης μανότη
βαρύτης κουφότης σκληρότης μαλακότης, ὡσαύ
τως δὲ καὶ εἴ τις ἄλλη τοιαύτη· κοιναὶ δὲ ὁμοίω
αὗται καὶ τῶν ἡμέρων καὶ τῶν ἀγρίων, ὥστε περ
πάντων λεκτέον.

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[1] ὅτι δ' ἡ conj. W.; ὅτι δὴ UMV; ὅτι δὲ Ald.
[2] *cf.* καταπίνεσθαι, above, § 2.
[3] Plin. 16. 198 and 199.
[4] ἐκγλύψας θῇ conj. W.; ἐκλύψας θῆι U; ἐκλιθασθῇ Ald. H.
[5] Text defective.
[6] *i.e.* the bark had grown over these. *cf.* Plin. *l.c.*

'centres' which occur in marbles. That[1] vigorous growth covers[2] up the knots is plain from simple observation of the fact and also from other similar instances. [3] For often some part of the tree itself is absorbed by the rest of the tree which has grown into it; and again, if one makes a hole in a tree and puts[4] a stone into it or some other such thing, it becomes buried, being completely enveloped by the wood which grows all round it: this happened with the wild olive in the market-place at Megara; there was an oracle that, if this were cut open, the city would be taken and plundered, which came to pass when Demetrius took it.[5] For, when this tree was split open, there were found greaves and certain other things[6] of Attic workmanship hanging there, the hole[7] in the tree having been made at the place where the things were originally hung on it as offerings. Of this tree a small part still exists, and in many other places further instances have occurred. Moreover, as has been said, such occurrences happen also with various other trees.

Of differences in the texture of different woods.

III. [8] Corresponding to the individual characters of the several trees we have the following kinds of differences in the wood:—it differs in closeness, heaviness, hardness or their opposites, and in other similar ways; and these differences are common to cultivated and wild trees. So that we may speak of all trees without distinction.

[1] *ἐργασίας κρεμαστὰ τοῦ κοτίνου οὗ* I conj. from G and Plin. *l.c.* (certain restoration perhaps impossible); *κερμηστι ὅ ἐστιν ἐν κοτίνῳ· οὗ* U; Ald. has *κερμηστὶ*, M *κρεμαστὶ*, V *κερμάστων*; St. suggested *κρεμαστῶν ὅπλων* as words of the original text. [8] Plin. 16. 204–207.

Πυκνότατα μὲν οὖν δοκεῖ καὶ βαρύτατα πύξος εἶναι καὶ ἔβενος· οὐδὲ γὰρ οὐδ' ἐπὶ τοῦ ὕδατος ταῦτ' ἐπινεῖ. καὶ ἡ μὲν πύξος ὅλη, τῆς δὲ ἐβένου ἡ μήτρα, ἐν ᾗ καὶ ἡ τοῦ χρώματός ἐστι μελανία. τῶν δ' ἄλλων ὁ λωτός. πυκνὸν δὲ καὶ ἡ τῆς δρυὸς μήτρα, ἣν καλοῦσι μελάνδρυον· καὶ ἔτι μᾶλλον ἡ τοῦ κυτίσου· παρομοία γὰρ αὕτη δοκεῖ τῇ ἐβένῳ εἶναι.

2 Μέλαν δὲ σφόδρα καὶ πυκνὸν τὸ τῆς τερμίνθου· περὶ γοῦν Συρίαν μελάντερόν φασιν εἶναι τῆς ἐβένου· καὶ ἐκ τούτου γὰρ καὶ τὰς λαβὰς τῶν ἐγχειριδίων ποιεῖσθαι, τορνεύεσθαι δὲ ἐξ αὐτῶν καὶ κύλικας Θηρικλείους, ὥστε μηδένα ἂν διαγνῶναι πρὸς τὰς κεραμέας· λαμβάνειν δὲ τὸ ἐγκάρδιον· δεῖν δὲ ἀλείφειν τὸ ξύλον· οὕτω γὰρ γίνεσθαι καὶ κάλλιον καὶ μελάντερον.

Εἶναι δὲ καὶ ἄλλο τι δένδρον, ὃ ἅμα τῇ μελανίᾳ καὶ ποικιλίαν τινὰ ἔχει ὑπέρυθρον, ὥστε εἶναι τὴν ὄψιν ὡσὰν ἐβένου ποικίλης· ποιεῖσθαι δ' ἐξ αὐτοῦ καὶ κλίνας καὶ δίφρους καὶ τὰ ἄλλα τὰ σπουδαζόμενα. τὸ <δὲ> δένδρον μέγα σφόδρα καὶ καλόφυλλον εἶναι ὅμοιον ταῖς ἀπίοις.

3 Ταῦτα μὲν οὖν ἅμα τῇ μελανίᾳ καὶ πυκνότητα ἔχει. πυκνὸν δὲ καὶ ἡ σφένδαμνος καὶ ἡ ζυγία καὶ ὅλως πάντα τὰ οὖλα· καὶ ἡ ἐλάα δὲ καὶ ὁ κότινος, ἀλλὰ κραῦρα. μανὰ δὲ τῶν μὲν ἀγρίων καὶ ἐρεψίμων τὰ ἐλάτινα μάλιστα,

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[1] *cf.* Arist. *Meteor.* 4. 7 *ad fin.*
[2] *cf.* 1. 6. 1. [3] *cf.* 3. 15. 3.
[4] Probably so called from their resemblance in shape and

Box and ebony seem to have the closest and heaviest wood; for their wood does not even float on water. This applies to the box-tree as a whole, and to the core of the ebony, which contains the black pigment.[1] The nettle-tree also is very close and heavy, and so is the core of the oak, which is called 'heart of oak,' and to a still greater degree this is true of the core of laburnum[2]; for this seems to resemble the ebony.

The wood of the terebinth is also very black and close-grained; at least in Syria[3] they say that it is blacker than ebony, that in fact they use it for making their dagger handles; and by means of the lathe-chisel they also make of it 'Theriklean' cups,[4] so that no one could[5] distinguish these from cups made of pottery; for this purpose they use, it is said, the heart-wood, but the wood has to be oiled, for then it becomes comelier and blacker.

There is also, they say, another tree[6] which, as well as the black colour, has a sort of reddish variegation, so that it looks like variegated ebony, and of it are made beds and couches and other things of superior quality. This tree is very large and has handsome leaves and is like the pear.

These trees then, as well as the black colour, have close wood; so also have maple *zygia* and in general all those that are of compact growth; so also have the olive and the wild olive, but their wood is brittle.[7] Of wild trees which are used for roof-timbers the wood of the silver-fir is the least com-

colour to the cups made by Therikles, a famous Corinthian potter; see reff. to comedy in LS. *s.v.*

[5] *μηδένα ἂν* conj. W.: *μηδ' ἂν ἕνα* Ald.

[6] Sissoo wood. See Index App. (21).

[7] *ἀλλὰ κραῦρα* conj. Sch.; *ἀλλὰ καὶ αὖρα* MVAld.

τῶν δ' ἄλλων τὰ ἄκτινα καὶ τὰ σύκινα καὶ τὰ τῆς μηλέας καὶ τὰ τῆς δάφνης. σκληρότατα δὲ τὰ δρύϊνα καὶ τὰ ζύγινα καὶ τὰ τῆς ἀρίας· καὶ γὰρ ὑποβρέχουσι ταῦτα πρὸς τὴν τρύπησιν μαλάξεως χάριν. μαλακὰ δὲ καθ' ὅλου μὲν τὰ μανὰ καὶ χαῦνα· τῶν δὲ σαρκωδῶν μάλιστα φίλυρα. δοκεῖ δὲ καὶ θερμότατον εἶναι τοῦτο· σημεῖον δὲ ὅτι μάλιστα ἀμβλύνει τὰ σιδήρια· τὴν γὰρ βαφὴν ἀνίησι διὰ τὴν θερμότητα.

4 Θερμὸν δὲ καὶ κιττὸς καὶ δάφνη καὶ ὅλως ἐξ ὧν τὰ πυρεῖα γίνεται· Μενέστωρ δέ φησι καὶ συκάμινον. ψυχρότατα δὲ τὰ ἔνυδρα καὶ ὑδατώδη. καὶ γλίσχρα δὲ τὰ ἰτέϊνα καὶ ἀμπέλινα, δι' ὃ καὶ τὰς ἀσπίδας ἐκ τούτων ποιοῦσι· συμμύει γὰρ πληγέντα· κουφότερον δὲ τὸ τῆς ἰτέας, μανότερον γάρ, δι' ὃ καὶ τούτῳ μᾶλλον χρῶνται. τὸ δὲ τῆς πλατάνου γλισχρότητα μὲν ἔχει, φύσει δὲ ὑγρότερον τοῦτο καὶ τὸ τῆς πτελέας. σημεῖον δέ ἐστιν, μετὰ τὴν τομὴν ὀρθὸν ὅταν σταθῇ, πολὺ ὕδωρ ἀφίησι. τὸ δὲ τῆς συκαμίνου πυκνὸν ἅμα καὶ γλίσχρον.

5 Ἔστι δὲ καὶ ἀστραβέστατον τὸ τῆς πτελέας, δι' ὃ καὶ τοὺς στροφεῖς τῶν θυρῶν ποιοῦσι πτελεΐνους· ἐὰν γὰρ οὗτοι μένωσι, καὶ αἱ θύραι μένουσιν ἀστραβεῖς, εἰ δὲ μή, διαστρέφονται. ποιοῦσι δ' αὐτοὺς ἔμπαλιν τιθέντες τά ξύλα τό τε ἀπὸ τῆς ῥίζης καὶ τὸ ἀπὸ τοῦ φύλλου·

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[1] *ὑποβρέχουσι* conj. Harduin from Plin. 16. 207; *ἀποβρίθουσι* Ald. H.; *ἀποβρέχουσι* mBas.

[2] *cf.* 5. 5. 1, which, referring to this passage, hardly agrees with it as now read.

pact, and among others that of the elder fig apple and bay. The hardest woods are those of the oak *zygia* and *aria* (holm-oak); in fact men wet[1] these to soften them for boring holes. In general, woods which are of open porous texture are soft, and of those of fleshy texture the softest is the lime. The last-named seems also to be the hottest; the proof of which is that it blunts iron tools more than any other; for they lose their edge[2] by reason of its heat.

Ivy and bay are also hot woods, and so in general are those used for making fire-sticks; and Menestor[3] adds the wood of the mulberry. [4]The coldest woods are those which grow in water and are of succulent character. The wood again of willow and vine is tough; wherefore men make their shields of these woods; for they close up again after a blow; but that of the willow is lighter, since it is of less compact texture; wherefore they use this for choice. The wood of the plane is fairly tough, but it is moister in character, as also is that of the elm. A proof of this is that, if it is set upright[5] after being cut, it discharges much water.[6] The wood of the mulberry is at once of close grain and tough.

[7]The wood of the elm is the least likely to warp; wherefore they make the 'hinges'[8] of doors out of elm wood; for, if these hold, the doors also keep in place; otherwise they get wrenched out of place. They make the 'hinges' by putting wood from the root above[9] and wood 'from the foliage' below,[9] thus

[3] *cf.* 1. 2. 3 n. [4] Plin. 16. 209.
[5] ὀρθὸν ὅταν conj. W.: so G; ὀρθὸς ὅταν MV; ὅταν ὀρθὰ Ald.
[6] *cf.* 5. 1. 6. [7] Plin. 16. 210.
[8] Sc. an arrangement of cylindrical pivot and socket.
[9] *i.e.* as socket and pivot respectively; *cf.* 5. 5. 4.

καλοῦσι δὲ οἱ τέκτονες τὸ ἀπὸ τοῦ φύλλου τὸ ἄνω· ἐναρμοσθέντα γὰρ ἀλλήλοις ἑκάτερον κωλύει πρὸς τὴν ὁρμὴν ἐναντίως ἔχον. εἰ δὲ ἔκειτο κατὰ φύσιν, οὗπερ ἡ ῥοπὴ ἐνταῦθα πάντων ἂν ἦν ἡ φορά.

Τὰς δὲ θύρας οὐκ εὐθὺς συντελοῦσιν, ἀλλὰ πήξαντες ἐφιστᾶσι, κἄπειτα ὑστέρῳ οἱ δὲ τῷ τρίτῳ ἔτει συνετέλεσαν ἐὰν μᾶλλον σπουδάζωσι· τοῦ μὲν γὰρ θέρους ἀναξηραινομένων διΐστανται, τοῦ δὲ χειμῶνος συμμύουσιν. αἴτιον δ' ὅτι τῆς ἐλάτης τὰ μανὰ καὶ σαρκώδη ἕλκει τὸν ἀέρα ἔνικμον ὄντα.

6 Ὁ δὲ φοῖνιξ κοῦφος καὶ εὔεργος καὶ μαλακός, ὥσπερ ὁ φελλός, βελτίων δὲ τοῦ φελλοῦ ὅτι γλίσχρος· ἐκεῖνο δὲ θραυστόν. διὰ τοῦτο τὰ εἴδωλα νῦν ἐκ τοῦ τῶν φοινίκων ποιοῦσι, τὸν δὲ φελλὸν παρήκασι. τὰς ἴνας δὲ οὐ δι' ὅλου ἔχει οὐδ' ἐπὶ πολὺ καὶ μακρὰς οὐδ' ὡσαύτως τῇ θέσει ἐγκειμένας πάσας ἀλλὰ παντοδαπῶς. ἀναξηραίνεται δὲ καὶ λεαινόμενον καὶ πριόμενον τὸ ξύλον.

7 Τὸ δὲ θύον, οἱ δὲ θύαν καλοῦσι, παρ' Ἄμμωνί τε γίνεται καὶ ἐν τῇ Κυρηναίᾳ, τὴν μὲν μορφὴν ὅμοιον κυπαρίττῳ καὶ τοῖς κλάδοις καὶ τοῖς φύλλοις καὶ τῷ στελέχει καὶ τῷ καρπῷ, μᾶλλον δ' ὥσπερ κυπάριττος ἀγρία· πολὺ μὲν καὶ ὅπου

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[1] κωλύει : Sch. adds θάτερον from G.
[2] ἔκειτο conj. W.; ἐκεῖνο Ald.
[3] *i.e.* the 'upper' wood in the upper position.
[4] πάντων MSS. (?) ; πάντως conj. W.
[5] *i.e.* there would be no resistance. ἦν after ἂν add. Sch.

reversing the natural position: (by wood 'from the foliage' joiners mean the upper wood). For, when these are fitted the one into the other, each counteracts[1] the other, as they naturally tend in opposite directions: whereas, if the wood were set[2] as it grows,[3] all the parts[4] would give where the strain came.[5]

(They do not finish off the doors at once; but, when they have put them together, stand them up, and then finish them off the next year, or sometimes the next year but one,[6] if they are doing specially good work. For in summer, as the wood dries, the work comes apart, but it closes in winter. The reason is that the open fleshy texture of the wood of the silver-fir[7] drinks in the air, which is full of moisture.)

[8] Palm-wood is light easily worked and soft like cork-oak, but is superior to that wood, as it is tough, while the other is brittle. Wherefore men now make their images of palm-wood and have given up the wood of cork-oak. However the fibres do not run throughout the wood, nor do they run to a good length, nor are they all set symmetrically, but run in every direction. The wood dries while it is being planed and sawn.

[9] *Thyon* (thyine wood), which some call *thya*, grows near the temple of Zeus Ammon and in the district of Cyrene. In appearance the tree is like the cypress alike in its branches, its leaves, its stem, and its fruit; or rather it is like a wild cypress.[10] There

[6] *cf.* Plin. 16. 215.
[7] Of which the door itself is made.
[8] Plin. 16. 211. [9] Plin. 13. 100–102.
[10] κυπάριττος ἀγρία conj. Sch.; κυπάρισσον ἀγρίαν MAld.

νῦν ἡ πόλις ἐστί, καὶ ἔτι διαμνημονεύουσιν ὀροφάς τινας τῶν ἀρχαίων οὔσας. ἀσαπὲς γὰρ ὅλως τὸ ξύλον οὐλότατον δὲ τὴν ῥίζαν ἐστί· καὶ ἐκ ταύτης τὰ σπουδαιότατα ποιεῖται τῶν ἔργων. τὰ δὲ ἀγάλματα γλύφουσιν ἐκ τῶνδε, κέδρων κυπαρίττου λωτοῦ πύξου· τὰ δ' ἐλάττω καὶ ἐκ τῶν ἐλαΐνων ῥιζῶν· ἀρραγεῖς γὰρ αὗται καὶ ὁμαλῶς πως σαρκώδεις. ταῦτα μὲν οὖν ἰδιότητά τινα τόπων καὶ φύσεως καὶ χρείας ἀποδηλοῖ.

IV. Βαρέα δὲ καὶ κοῦφα δῆλον ὡς τῇ πυκνότητι καὶ μανότητι καὶ ὑγρότητι καὶ ξηρότητι καὶ τῷ γλοιώδει καὶ σκληρότητι καὶ μαλακότητι ληπτέον. ἔνια μὲν οὖν ἅμα σκληρὰ καὶ βαρέα, καθάπερ πύξος καὶ δρῦς· ὅσα δὲ κραῦρα καὶ τῇ ξηρότητι σκληρότατα, ταῦτ' οὐκ ἔχει βάρος. ἅπαντα δὲ τὰ ἄγρια τῶν ἡμέρων καὶ τὰ ἄρρενα τῶν θηλειῶν πυκνότερά τε καὶ σκληρότερα καὶ βαρύτερα καὶ τὸ ὅλον ἰσχυρότερα, καθάπερ καὶ πρότερον εἴπομεν. ὡς δ' ἐπὶ τὸ πᾶν καὶ τὰ ἀκαρπότερα τῶν καρπίμων καὶ τὰ χείρω τῶν καλλικαρποτέρων· εἰ μή που καρπιμώτερον τὸ ἄρρεν, ὥσπερ ἄλλα τέ φασι καὶ τὴν κυπάριττον καὶ τὴν κράνειαν. ἀλλὰ τῶν γε ἀμπέλων φανερῶς αἱ ὀλιγοκαρπότεραι καὶ πυκνοφθαλμότεραι καὶ στερεώτεραι· καὶ μηλεῶν δὲ καὶ τῶν ἄλλων ἡμέρων.

is abundance of it where now the city stands, and men can still recall that some of the roofs in ancient times were made of it. For the wood is absolutely proof against decay, and the root is of very compact texture, and they make of it the most valuable articles. Images are carved from these woods, prickly cedar cypress nettle-tree box, and the small ones also from the roots of the olive, which are unbreakable and of a more or less uniformly fleshy character. The above facts illustrate certain special features of position, natural character and use.

Of differences in timber as to hardness and heaviness.

IV. Difference in weight is clearly to be determined by closeness or openness of texture, dampness or dryness, degree of glutinousness, hardness or softness. Now some woods are both hard and heavy, as box and oak, while those that are brittle and hardest owing to their dryness, are not heavy. [1] All wood of wild trees, as we have said before, is closer harder heavier, and in general stronger than that of the cultivated forms, and there is the same difference between the wood of 'male' and of 'female' trees, and in general between trees which bear no fruit and those which have fruit, and between those which bear inferior fruit and those whose fruit is better; on the other hand occasionally the 'male' tree is the more fruitful, for instance, it is said, the cypress the cornelian cherry and others. However of vines it is clear that those which bear less fruit have also more frequent knots and are more solid,[2] and so too with apples and other cultivated trees.

[1] Plin. 16. 211. [2] *cf. C.P.* 3. 11. 1.

2 Ἀσαπῆ δὲ φύσει κυπάριττος κέδρος ἔβενος λωτὸς πύξος ἐλάα κότινος πεύκη ἔνδαδος ἀρία δρῦς καρύα Εὐβοϊκή. τούτων δὲ χρονιώτατα δοκεῖ τὰ κυπαρίττινα εἶναι· τὰ γοῦν ἐν Ἐφέσῳ, ἐξ ὧν αἱ θύραι τοῦ νεωστὶ νεώ, τεθησαυρισμένα τέτταρας ἔκειτο γενεάς.[1] μόνα δὲ καὶ στιλβηδόνα δέχεται, δι' ὃ καὶ τὰ σπουδαζόμενα τῶν ἔργων ἐκ τούτων ποιοῦσι. τῶν δὲ ἄλλων ἀσαπέστατον μετὰ τὰ κυπαρίττινα καὶ τὰ θυώδη τὴν συκάμινον εἶναί φασι, καὶ ἰσχυρὸν ἅμα καὶ εὔεργον τὸ ξύλον· γίνεται δὲ τὸ ξύλον [καὶ] παλαιούμενον μέλαν, ὥσπερ λωτός.

3 Ἔτι δὲ ἄλλο πρὸς ἄλλο καὶ ἐν ἄλλῳ ἀσαπές, οἷον πτελέα μὲν ἐν τῷ ἀέρι, δρῦς δὲ κατορυττομένη καὶ ἐν τῷ ὕδατι καταβρεχομένη· δοκεῖ γὰρ ὅλως ἀσαπὲς εἶναι· δι' ὃ καὶ εἰς τοὺς ποταμοὺς καὶ εἰς τὰς λίμνας ἐκ τούτων ναυπηγοῦσιν· ἐν δὲ τῇ θαλάττῃ σήπεται. τὰ δὲ ἄλλα διαμένει μᾶλλον, ὅπερ καὶ εὔλογον, ταριχευόμενα τῇ ἅλμῃ.

4 Δοκεῖ δὲ καὶ ἡ ὀξύη πρὸς τὸ ὕδωρ ἀσαπὴς εἶναι καὶ βελτίων γίνεσθαι βρεχομένη. καὶ ἡ καρύα δὲ ἡ Εὐβοϊκὴ ἀσαπής. φασὶ δὲ καὶ τὴν πεύκην ἐλάτης μᾶλλον ὑπὸ τερηδόνος ἐσθίεσθαι· τὴν μὲν γὰρ εἶναι ξηράν, τὴν δὲ πεύκην ἔχειν γλυκύτητα, καὶ ὅσῳ ἐνδαδωτέρα, μᾶλλον· πάντα

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[1] Plin. 16. 213.

[2] τεθησαυρισμένα . . . ἔκειτο conj. Bentley; τεθησαυρισμέναι . . . ἔκειντο Ald. H.; P has ἔκειτο.

Of differences in the keeping quality of timber.

[1] Naturally proof against decay are cypress prickly cedar ebony nettle-tree box olive wild olive resinous fir *aria* (holm-oak) oak sweet chestnut. Of these the wood of the cypress seems to last longest; at least the cypress-wood at Ephesus, of which the doors of the modern temple were made, lay stored up[2] for four generations. And this is the only wood which takes a fine polish, wherefore they make of it valuable articles. Of the others the least liable to decay after the wood of the cypress and thyine-wood is, they say, that of the mulberry, which is also strong and easily worked: when it becomes old, this wood turns black like that of the nettle-tree.

[3] Again whether a given wood is not liable to decay may depend on the purpose to which it is put and the conditions to which it is subjected: thus the elm does not decay if exposed to the air, nor the oak if it is buried or soaked in water; for it appears to be entirely proof against decay: wherefore they build vessels of it for use on rivers and on lakes, but in sea-water it rots, though other woods last all the better; which is natural, as they become seasoned with the brine.

[4] The beech also seems to be proof against decay in water and to be improved by being soaked. The sweet chestnut under like treatment is also proof against decay. They say that the wood of the fir is more liable to be eaten by the *teredon* than that of the silver-fir; for that the latter is dry, while the fir has a sweet taste, and that this is more so, the more the wood is soaked with resin[5]; they go on to

[3] Plin. 16. 218. [4] Plin. 16. 218 and 219.
[5] *cf.* 3. 9. 4.

δ' ἐσθίεσθαι τερηδόνι πλὴν κοτίνου καὶ ἐλάας· τὰ δὲ οὔ, διὰ τὴν πικρότητα. ἐσθίεται δὲ τὰ μὲν ἐν τῇ θαλάττῃ σηπόμενα ὑπὸ τερηδόνος, τὰ δ' ἐν τῇ γῇ ὑπὸ σκωλήκων καὶ ὑπὸ θριπῶν· οὐ γὰρ γίνεται τερηδὼν ἀλλ' ἢ ἐν τῇ θαλάττῃ. ἔστι δὲ ἡ τερηδὼν τῷ μὲν μεγέθει μικρόν, κεφαλὴν δ' ἔχει
5 μεγάλην καὶ ὀδόντας· οἱ δὲ θρίπες ὅμοιοι τοῖς σκώληξιν, ὑφ' ὧν τιτραίνεται κατὰ μικρὸν τὰ ξύλα. καὶ ἔστι ταῦτα εὐίατα· πιττοκοπηθέντα γὰρ ὅταν εἰς τὴν θάλατταν ἐλκυσθῇ στέγει· τὰ δὲ ὑπὸ τῶν τερηδόνων ἀνίατα. τῶν δὲ σκωλήκων τῶν ἐν τοῖς ξύλοις οἱ μέν εἰσιν ἐκ τῆς οἰκείας σήψεως, οἱ δ' ἐντικτόντων ἑτέρων· ἐντίκτει γάρ, ὥσπερ καὶ τοῖς δένδροις, ὁ κεράστης καλούμενος, ὅταν τιτράνῃ καὶ κοιλάνῃ περιστραφεὶς ὡσπερεὶ μυοδόχον. φεύγει δὲ τά τε ὀσμώδη καὶ πικρὰ καὶ σκληρὰ διὰ τὸ μὴ δύνασθαι τιτρᾶναι, καθάπερ
6 τὴν πύξον. φασὶ δὲ καὶ τὴν ἐλάτην φλοῖσθεῖσαν ὑπὸ τὴν βλάστησιν ἀσαπῆ διαμένειν ἐν τῷ ὕδατι· φανερὸν δὲ γενέσθαι ἐν Φενεῷ τῆς Ἀρκαδίας, ὅτε αὐτοῖς ἐλιμνώθη τὸ πεδίον φραχθέντος τοῦ βερέθρου· τότε γὰρ τὰς γεφύρας ποιοῦντες ἐλατίνας καί, ὅταν ἐπαναβαίνῃ τὸ ὕδωρ, ἄλλην καὶ ἄλλην ἐφιστάντες, ὡς ἐρράγη καὶ ἀπῆλθε, πάντα εὑρεθῆναι τὰ ξύλα ἀσαπῆ. τοῦτο μὲν οὖν ἐκ συμπτώματος.

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[1] Plin. 16. 220 and 221.

[2] τιτραίνεται conj. Scal. from G; τιτρένεται UVo.; πεπαίνεται MVAld. [3] *cf* 4. 14. 5.

[4] ὡσπερεὶ μυοδόχον conj. W.; ὥσπερ οἱ μυόχοδοι MSS.; G omits. The word μυοδόχος does not occur elsewhere as a subst.

say that all woods are eaten by the *teredon* except the olive, wild or cultivated, and that these woods escape because of their bitter taste. [1] Now woods which decay in sea-water are eaten by the *teredon*, those which decay on land by the *skolex* and *thrips*; for the *teredon* does not occur except in the sea. It is a creature small in size, but has a large head and teeth; the *thrips* resembles the *skolex*, and these creatures gradually bore through [2] timber. The harm that these do is easy to remedy: for, if the wood is smeared with pitch, it does not let in water when it is dragged down into the sea; but the harm done by the *teredon* cannot be undone. Of the *skolekes* which occur in wood some come from the decay of the wood itself, some from other *skolekes* which engender therein. For these produce their young in timber, as the worm called the 'horned worm' [3] does in trees, having bored and scooped out a sort of mouse-hole [4] by turning round and round. But it avoids wood which has a strong smell or is bitter or hard, such as boxwood, since it is unable to bore through it. They say too that the wood of the silver-fir, if barked just before the time of budding, remains in water without decaying, and that this was clearly seen at Pheneos in Arcadia, when their plain was turned into a lake since the outlet was blocked up.[5] For at that time they made [6] their bridges of this wood, and, as the water rose, they placed more and more atop of them, and, when the water burst its way through and disappeared, all the wood was found to be undecayed. This fact then became known by means of an accident.

[5] *cf.* 3. 1. 2. *φραχθέντος* conj. Sch.; *βραχέντος* Ald. H.
[6] *ποιοῦντες, ἐφιστάντες nom. pendens.*

7 Ἐν Τύλῳ δὲ τῇ νήσῳ τῇ περὶ τὴν Ἀραβίαν εἶναί τί φασι ξύλον ἐξ οὗ τὰ πλοῖα ναυπηγοῦνται· τοῦτο δὲ ἐν μὲν τῇ θαλάττῃ σχεδὸν ἄσηπτον εἶναι· διαμένει γὰρ ἔτη πλείω ἢ διακόσια καταβυθιζόμενον· ἐὰν δὲ ἔξω, χρόνιον μὲν θᾶττον δὲ σήπεται. (θαυμαστὸν δὲ καὶ ἕτερον λέγουσι, οὐδὲν δὲ πρὸς τὴν σῆψιν. εἶναι γάρ τι δένδρον ἐξ οὗ τὰς βακτηρίας τέμνεσθαι, καὶ γίνεσθαι καλὰς σφόδρα ποικιλίαν τινὰ ἐχούσας ὁμοίαν τῷ τοῦ τίγριος δέρματι· βαρὺ δὲ σφόδρα τὸ ξύλον τοῦτο· ὅταν δέ τις ῥίψῃ πρὸς στερεώτερον τόπον, κατάγνυσθαι καθάπερ τὰ κεράμια.)

8 Καὶ τὸ τῆς μυρίκης δὲ ξύλον οὐχ ὥσπερ ἐνταῦθα ἀσθενές, ἀλλ' ἰσχυρὸν ὥσπερ πρίνινον ἢ καὶ ἄλλο τι τῶν ἰσχυρῶν. τοῦτο μὲν οὖν ἅμα μηνύει χώρας τε καὶ ἀέρος διαφορὰς καὶ δυνάμεις. τῶν δὲ ὁμογενῶν ξύλων, οἷον δρυΐνων πευκίνων, ὅταν ταριχεύωνται—ταριχεύουσι γὰρ οὐκ ἐν ἴσῳ βάθει πάντα δύοντες τῆς θαλάττης, ἀλλὰ τὰ μὲν πρὸς αὐτῇ τῇ γῇ, τὰ δὲ μικρὸν ἀνωτέρω, τὰ δ' ἐν πλείονι βάθει· πάντων δὲ τὰ πρὸς τὴν ῥίζαν θᾶττον δύεται καθ' ὕδατος, κἂν ἐπινῇ μᾶλλον ῥέπει κάτω.

V. Ἔστι δὲ τὰ μὲν εὔεργα τῶν ξύλων, τὰ δὲ δύσεργα· εὔεργα μὲν τὰ μαλακά, καὶ πάντων

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[1] Plin. 16. 221; *cf.* 4. 7. 7.
[2] Teak. See Index App. (22).
[3] Calamander-wood. See Index App. (23).

[1] In the island of Tylos off the Arabian coast they say that there is a kind of wood[2] of which they build their ships, and that in sea-water this is almost proof against decay; for it lasts more than 200 years if it is kept under water, while, if it is kept out of water, it decays sooner, though not for some time. They also tell of another strange thing, though it has nothing to do with the question of decay: they say that there is a certain tree,[3] of which they cut their staves, and that these are very handsome, having a variegated appearance like the tiger's skin; and that this wood is exceedingly heavy, yet when one throws it down on hard ground[4] it breaks in pieces like pottery.

Moreover, the wood of the tamarisk[5] is not weak there, as it is in our country, but is as strong as kermes-oak or any other strong wood. Now this illustrates also the difference in properties caused by country and climate. Moreover when wood, such as that of oak or fir, is soaked in brine—not all being soaked at the same depth in the sea, but some of it close to shore, some rather further out, and some at a still greater depth—[6] in all cases the parts of the tree nearest the root (whichever tree it is) sink quicker under water, and even if they float, have a greater tendency to sink.

Which kinds of wood are easy and which hard to work. Of the core and its effects.

V. Some wood is easy to work, some difficult. Those woods which are soft are easy, and especially

[4] *πρὸς στερ. τόπον* can hardly be sound: ? 'on something harder than itself.'

[5] See Index, *μυρίκη* (2). [6] Plin. 16. 186.

μάλιστα φίλυρα· δύσεργα δὲ καὶ τὰ σκληρὰ καὶ τὰ ὀζώδη καὶ οὔλας ἔχοντα συστροφάς· δυσεργότατα δὲ ἀρία καὶ δρῦς, ὡς δὲ κατὰ μέρος ὁ τῆς πεύκης ὄζος καὶ τῆς ἐλάτης. ἀεὶ δὲ τῶν ὁμογενῶν τὸ μαλακώτερον τοῦ σκληροτέρου κρεῖττον· σαρκωδέστερον γάρ· καὶ εὐθὺ σκοποῦνται τὰς σανίδας οἱ τέκτονες οὕτως. τὰ δὲ μοχθηρὰ σιδήρια δύναται τέμνειν τὰ σκληρὰ μᾶλλον τῶν μαλακῶν· ἀνίησι γὰρ ἐν τοῖς μαλακοῖς, ὥσπερ ἐλέχθη περὶ τῆς φιλύρας, παρακονᾷ δὲ μάλιστα τὰ σκληρά· δι' ὃ καὶ οἱ σκυτοτόμοι ποιοῦνται τοὺς πίνακας ἀχράδος.

2 Μήτραν δὲ πάντα μὲν ἔχειν φασὶν οἱ τέκτονες φανερὰν δ' εἶναι μάλιστα ἐν τῇ ἐλάτῃ· φαίνεσθαι γὰρ οἷον φλοιώδη τινὰ τὴν σύνθεσιν αὐτῆς τῶν κύκλων. ἐν ἐλάᾳ δὲ καὶ πύξῳ καὶ τοῖς τοιούτοις οὐχ ὁμοίως· δι' ὃ καὶ οὔ φασί τινες ἔχειν τῇ δυνάμει πύξον καὶ ἐλάαν· ἥκιστα γὰρ ἕλκεσθαι ταῦτα τῶν ξύλων. ἔστι δὲ τὸ ἕλκεσθαι τὸ συμπεριίστασθαι κινουμένης τῆς μήτρας. ζῇ γὰρ ὡς ἔοικεν ἐπὶ χρόνον πολύν· δι' ὃ πανταχόθεν μὲν ἅμα μάλιστα δ' ἐκ τῶν θυρωμάτων ἐξαιροῦσιν, ὅπως ἀστραβῇ ᾖ· καὶ διὰ τοῦτο σχίζουσιν.

3 Ἄτοπον δ' ἂν δόξειεν ὅτι ἐν μὲν τοῖς ξύλοις τοῖς στρογγύλοις ἄλυπος ἡ μήτρα καὶ ἀκίνητος, ἐν δὲ τοῖς παρακινηθεῖσιν, ἐὰν μὴ ὅλως ἐξαιρεθῇ,

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[1] 5. 3. 3.

[2] τὰ σκληρὰ conj. Sch. from G (?); ταῦτα P_2Ald.H.

[3] ἔχειν conj. Sch.; ἔχει ᾗ Ald.H.

[4] ἐλάαν conj. Scal. from G; ἐλάτην Ald.H.

[5] *i.e.* and this happens less in woods which have little core.

[6] ἅμα (? = ὁμοίως) MSS.; αὐτὴν conj. W.

that of the lime; those are difficult which are hard and have many knots and a compact and twisted grain. The most difficult woods are those of *aria* (holm-oak) and oak, and the knotty parts of the fir and silver-fir. The softer part of any given tree is always better than the harder, since it is fleshier: and carpenters can thus at once mark the parts suitable for planks. Inferior iron tools can cut hard wood better than soft: for on soft wood tools lose their edge, as was said[1] in speaking of the lime, while hard woods[2] actually sharpen it: wherefore cobblers make their strops of wild pear.

Carpenters say that all woods have[3] a core, but that it is most plainly seen in the silver-fir, in which one can detect a sort of bark-like character in the rings. In olive box and such woods this is not so obvious; wherefore they say that box and olive[4] lack this tendency; for that these woods are less apt to 'draw' than any others. 'Drawing' is the closing in of the wood as the core is disturbed.[5] For since the core remains alive, it appears, for a long time, it is always removed from any article whatever made of this wood,[6] but especially from doors,[7] so that they may not warp[8]: and that is why the wood is split.[9]

It might seem strange that in 'round'[10] timber the core does no harm and so is left undisturbed, while in wood whose texture has been interfered with,[11] unless it is taken out altogether, it causes

[7] *θυρωμάτων* conj. Sch.; *γυρωμάτων* Ald. *cf.* 4. 1. 2; Plin. 16. 225, *abietem valvarum paginis aptissimam.*

[8] *ἀστραβῆ ᾖ* conj. Dalec.; *ἀστραβῆ* UMVAld.

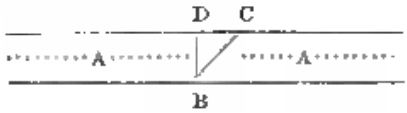
[9] *i.e.* to extract the core. [10] See below, § 5.

[11] *παρακινηθεῖσι*, *i.e.* by splitting or sawing. *πελεκηθεῖσι* conj. W.

κινεῖ καὶ παραστρέφει· μᾶλλον γὰρ εἰκὸς γυμνωθεῖσαν ἀποθνήσκειν. ὅμως δὲ οἵ γε ἱστοὶ καὶ αἱ κεραῖαι ἐξαιρεθείσης ἀχρεῖοι. τοῦτο δὲ κατὰ συμβεβηκός, ὅτι χιτῶνας ἔχει πλείους, ἰσχυρότατον δὲ καὶ λεπτότατον δὲ τὸν ἔσχατον, ξηρότατον γάρ, καὶ τοὺς ἄλλους ἀνὰ λόγον. ὅταν οὖν
4 σχισθῇ, περιαιρεῖται τὰ ξηρότατα. εἰ δ' ἡ μήτρα διὰ τὸ ξηρὸν σκεπτέον. διαστρέφει δὲ ἑλκομένη τὰ ξύλα καὶ ἐν τοῖς σχιστοῖς καὶ πριστοῖς, ὅταν μὴ ὡς δεῖ πρίωσι· δεῖ γὰρ ὀρθὴν τὴν πρίσιν εἶναι καὶ μὴ πλαγίαν. οἷον οὔσης τῆς μήτρας ἐφ' ἣν τὸ α, μὴ παρὰ τὴν βγ τέμνειν, ἀλλὰ παρὰ τὴν βδ. φθείρεσθαι γὰρ οὕτω φασίν, ἐκείνως δὲ ζῆν. ὅτι δὲ πᾶν ξύλον ἔχει μήτραν ἐκ τούτων οἴονται· φανερὸν γάρ ἐστι καὶ τὰ μὴ δοκοῦντα πάντ' ἔχειν, οἷον πύξον λωτὸν πρῖνον. σημεῖον δέ· τοὺς γὰρ στρόφιγγας τῶν θυρῶν τῶν πολυτελῶν ποιοῦσι μὲν ἐκ τούτων, συγγράφονται δὲ οἱ ἀρχιτέκτονες οὕτως <μὴ> ἐκ μήτρας. ταὐτὸ δὲ τοῦτο σημεῖον καὶ ὅτι πᾶσα μήτρα ἕλκεται, καὶ αἱ τῶν σκληρο-
5 τάτων, ἃς δή τινες καρδίας καλοῦσι. παντὸς δὲ

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[1] And so cause no trouble.
[2] *cf.* 5. 1. 6. πλείους conj. Sch. from G ; ἄλλους Ald.H.
[3] Text probably defective ; ? insert ἐξηρέθη after ξηρὸν.
[4] The figure would seem to be



disturbance and warping: it were rather to be expected that it would die[1] when exposed. Yet it is a fact that masts and yard-arms are useless, if it has been removed from the wood of which they are made. This is however an accidental exception, because the wood in question has several coats,[2] of which the strongest and also thinnest is the outermost, since this is the driest, while the other coats are strong and thin in proportion to their nearness to the outermost. If therefore the wood be split, the driest parts are necessarily stripped off. Whether however in the other case the object of removing the core is to secure dryness is matter for enquiry.[3] However, when the core 'draws,' it twists the wood, whether it has been split or sawn, if the sawing is improperly performed: the saw-cut should be made straight and not slantwise. [4]Thus, if the core be represented by the line *A*, the cut must be made along the line *BD*, and not along the line *BC*: for in that case, they say, the core will be destroyed, while, if cut in the other way, it will live. For this reason men think that every wood has a core: for it is clear that those which do not seem to possess one nevertheless have it, as box nettle-tree kermes-oak: a proof of this is the fact that men make of these woods the pivots[5] of expensive doors, and accordingly[6] the headcraftsmen specify that wood with a core shall not[7] be used. This is also a proof that any core 'draws,' even those of the hardest woods, which some call the heart. In almost every wood, even

[5] *cf.* 5. 3. 5. στρόφιγξ here at least probably means 'pivot *and* socket.'

[6] οὕτως Ald.H.; αὐτοὺς conj. W. [7] μὴ add. W.

ὡς εἰπεῖν ξύλου σκληροτάτη καὶ μανοτάτη ἡ μήτρα, καὶ αὐτῆς τῆς ἐλάτης· μανοτάτη μὲν οὖν, ὅτι τὰς ἴνας ἔχει καὶ διὰ πολλοῦ καὶ τὸ σαρκῶδες τὸ ἀνὰ μέσον πολύ· σκληροτάτη δέ, ὅτι καὶ αἱ ἶνες σκληρόταται καὶ τὸ σαρκῶδες· δι' ὃ καὶ οἱ ἀρχιτέκτονες συγγράφονται παραιρεῖν τὰ πρὸς τὴν μήτραν, ὅπως λάβωσι τοῦ ξύλου τὸ πυκνότατον καὶ μαλακώτατον.

6 Τῶν δὲ ξύλων τὰ μὲν σχιστὰ τὰ δὲ πελεκητὰ τὰ δὲ στρογγύλα· σχιστὰ μέν, ὅσα διαιροῦντες κατὰ τὸ μέσον πρίζουσι· πελεκητὰ δέ, ὅσων ἀποπελεκῶσι τὰ ἔξω· στρογγύλα δὲ δῆλον ὅτι τὰ ὅλως ἄψαυστα. τούτων δὲ τὰ σχιστὰ μὲν ὅλως ἀρραγῆ διὰ τὸ γυμνωθεῖσαν τὴν μήτραν ξηραίνεσθαι καὶ ἀποθνήσκειν· τὰ δὲ πελεκητὰ καὶ τὰ στρογγύλα ῥήγνυται· μᾶλλον δὲ πολὺ τὰ στρογγύλα διὰ τὸ ἐναπειλῆφθαι τὴν μήτραν· οὐδὲν γὰρ ὅτι τῶν ἁπάντων οὐ ῥήγνυται. τοῖς δὲ λωτίνοις καὶ τοῖς ἄλλοις οἷς εἰς τοὺς στρόφιγγας χρῶνται πρὸς τὸ μὴ ῥήγνυσθαι βόλβιτον περιπλάττουσιν, ὅπως ἀναξηρανθῇ καὶ διαπνευσθῇ κατὰ μικρὸν ἡ ἐκ τῆς μήτρας ὑγρότης. ἡ μὲν οὖν μήτρα τοιαύτην ἔχει δύναμιν.

VI. Βάρος δὲ ἐνεγκεῖν ἰσχυρὰ καὶ ἡ ἐλάτη καὶ ἡ πεύκη πλάγιαι τιθέμεναι· οὐδὲν γὰρ ἐν-

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[1] ξύλου σκληροτάτη conj. Sch. from G ; ξύλον σκληρότατον UMV; so Ald. omitting καὶ.

[2] ἀποπελεκῶσι conj. Sch.; ἀποπλέκωσι UM ; ἀποπλέκουσι Ald.; ἀποπελέκουσι mBas. [3] *cf. C.P.* 5. 17. 2.

in that of the silver-fir, the core is the hardest part,[1] and the part which has the least fibrous texture:—it is least fibrous because the fibres are far apart and there is a good deal of fleshy matter between them, while it is the hardest part because the fibres and the fleshy substance are the hardest parts. Wherefore the headcraftsmen specify that the core and the parts next it are to be removed, that they may secure the closest and softest part of the wood.

Timber is either 'cleft,' 'hewn,' or 'round': it is called 'cleft,' when in making division they saw it down the middle, 'hewn' when they hew off[2] the outer parts, while 'round' clearly signifies wood which has not been touched at all. Of these, 'cleft' wood[3] is not at all liable to split, because the core when exposed dries and dies: but 'hewn' and 'round' wood are apt to split, and especially 'round' wood, because the core is included in it: no kind of timber indeed is altogether incapable of splitting. The wood of the nettle-tree and other kinds which are used for making pivots for doors are smeared[4] with cow-dung to prevent their splitting: the object being that the moisture due to the core may be gradually dried up[5] and evaporated. Such are the natural properties of the core.

Which woods can best support weight.

VI.[6] For bearing weight silver-fir and fir are strong woods, when set slantwise[7]: for they do not give like

[4] *περιπλάττουσι* conj. Sch. from G; *περιπάττουσιν* Ald.H. Plin. 16. 222. [5] *ἀναξηρανθῇ* conj. Sch.; *ἀναξηραίνῃ* Ald.H.

[6] Plin. 16. 222–224.

[7] *e.g.* as a strut. *πλάγιαι* conj. Sch. from Plin. *l.c.*; *ἀπαλαὶ* Ald.H.

διδόασιν, ὥσπερ ἡ δρῦς καὶ τὰ γεώδη, ἀλλ' ἀντωθοῦσι· σημεῖον δὲ ὅτι οὐδέποτε ῥήγνυνται, καθάπερ ἐλάα καὶ δρῦς, ἀλλὰ πρότερον σήπονται καὶ ἄλλως ἀπαυδῶσιν. ἰσχυρὸν δὲ καὶ ὁ φοῖνιξ· ἀνάπαλιν γὰρ ἡ κάμψις ἢ τοῖς ἄλλοις γίνεται· τὰ μὲν γὰρ εἰς τὰ κάτω κάμπτεται, ὁ δὲ φοῖνιξ εἰς τὰ ἄνω. φασὶ δὲ καὶ τὴν πεύκην καὶ τὴν ἐλάτην ἀντωθεῖν. τὸ δὲ τῆς Εὐβοϊκῆς καρύας, γίνεται γὰρ μέγα καὶ χρῶνται πρὸς τὴν ἔρεψιν, ὅταν μέλλῃ ῥήγνυσθαι ψοφεῖν ὥστε προαισθάνεσθαι πρότερον· ὅπερ καὶ ἐν Ἀντάνδρῳ συνέπεσεν ἐν τῷ βαλανείῳ καὶ πάντες ἐξεπήδησαν. ἰσχυρὸν δὲ καὶ τὸ τῆς συκῆς πλὴν εἰς ὀρθόν.

2 Ἡ δὲ ἐλάτη μάλιστα ὡς εἰπεῖν ἰσχυρόν. πρὸς δὲ τὰς τῶν τεκτόνων χρείας ἐχέκολλον μὲν μάλιστα ἡ πεύκη διά τε τὴν μανότητα καὶ τὴν εὐθυπορίαν· οὐδὲ γὰρ ὅλως οὐδὲ ῥήγνυσθαί φασιν ἐὰν κολληθῇ. εὐτορνότατον δὲ φιλύκη, καὶ ἡ λευκότης ὥσπερ ἡ τοῦ κηλάστρου. τῶν δὲ ἄλλων ἡ φίλυρα· τὸ γὰρ ὅλον εὔεργον, ὥσπερ ἐλέχθη, διὰ μαλακότητα. εὔκαμπτα δὲ ὡς μὲν ἁπλῶς εἰπεῖν ὅσα γλίσχρα. διαφέρειν δὲ δοκεῖ συκάμινος καὶ ἐρινεός, δι' ὃ καὶ τὰ ἴκρια καὶ τὰς στεφάνας καὶ ὅλως ὅσα περὶ τὸν κόσμον ἐκ τούτων ποιοῦσι.

3 Εὔπριστα δὲ καὶ εὔσχιστα τὰ ἐνικμότερα τῶν

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[1] *i.e.* the strut becomes concave or convex respectively. *cf.* Xen. *Cyr.* 7. 5. 11.

[2] *i.e.* it cannot be used as a strut, or it would 'buckle,' though it will stand a vertical strain.

[3] Plin. 16. 225.

[4] *cf. C.P.* 5. 17. 3. εὐθυπορώτατα : εὐθυπορίαν.

oak and other woods which contain mineral matter, but make good resistance. A proof of this is that they never split like olive and oak, but decay first or fail in some other way. Palm-wood is also strong, for it bends the opposite way to other woods: they bend downwards, palm-wood upwards.[1] It is said that fir and silver-fir also have an upward thrust. As to the sweet chestnut, which grows tall and is used for roofing, it is said that when it is about to split, it makes a noise, so that men are forewarned: this occurred once at Antandros at the baths, and all those present rushed out. Fig-wood is also strong, but only when set upright.[2]

Of the woods best suited for the carpenter's various purposes.

[3]The wood of the silver-fir may be called the strongest of all. But for the carpenter's purposes fir best takes glue because of its open texture and the straightness of its pores[4]; for they say that it never by any chance comes apart when it is glued. Alaternus[5] is the easiest wood for turning, and its whiteness is like that of the holly. Of the rest lime is the easiest, the whole tree, as was said, being easy to work because of the softness of the wood. In general those woods which are tough are easy to bend. The mulberry and the wild fig seem to be specially so; wherefore they make of these theatre-seats,[6] the hoops of garlands, and, in general, things for ornament.

[7]Woods which have a fair amount of moisture in them are easier to saw or split than those which

[5] *cf.* 5. 7. 7.

[6] Rendering doubtful. ἴκρια has probably here some unknown meaning, on which the sense of κόσμον depends.

[7] Plin. 16. 227.

πάμπαν ξηρῶν· τὰ μὲν γὰρ παύονται, τὰ δὲ ἵστανται· τὰ δὲ χλωρὰ λίαν συμμύει καὶ ἐνέχεται ἐν τοῖς ὀδοῦσι τὰ πρίσματα καὶ ἐμπλάττει, δι' ὃ καὶ παραλλάττουσιν ἀλλήλων τοὺς ὀδόντας ἵνα ἐξάγηται. ἔστι δὲ καὶ δυστρυπητότερα τὰ λίαν χλωρά· βραδέως γὰρ ἀναφέρεται τὰ ἐκτρυπήματα διὰ τὸ βαρέα εἶναι· τῶν δὲ ξηρῶν ταχέως καὶ εὐθὺς ὁ ἀὴρ ἀναθερμαινόμενος ἀναδίδωσι· πάλιν δὲ τὰ λίαν ξηρὰ διὰ τὴν σκληρότητα δύσπριστα· καθάπερ γὰρ ὄστρακον συμβαίνει πρίειν, δι' ὃ καὶ τρυπῶντες ἐπιβρέχουσιν.

4 Εὐπελεκητότερα δὲ καὶ εὐτορνότερα καὶ εὐξοώτερα τὰ χλωρά· προσκάθηταί τε γὰρ τὸ τορνευτήριον μᾶλλον καὶ οὐκ ἀποπηδᾷ. καὶ ἡ πελέκησις τῶν μαλακωτέρων ῥᾴων, καὶ ἡ ξέσις δὲ ὁμοίως καὶ ἔτι λειοτέρα. ἰσχυρότατον δὲ καὶ ἡ κράνεια, τῶν δὲ ἄλλων οὐχ ἥκιστα ἡ πτελέα, δι' ὃ καὶ τοὺς στροφέας, ὥσπερ ἐλέχθη, ταῖς θύραις πτελείνους ποιοῦσιν. ὑγρότατον δὲ μελία καὶ ὀξύη· καὶ γὰρ τὰ κλινάρια τὰ ἐνδιδόντα ἐκ τούτων.

VII. Ὅλως δὲ πρὸς ποῖα τῆς ὕλης ἑκάστη χρησίμη καὶ ποία ναυπηγήσιμος καὶ οἰκοδομική, πλείστη γὰρ αὕτη ἡ χρεία καὶ ἐν μεγίστοις, πειρατέον εἰπεῖν, ἀφορίζοντα καθ' ἕκαστον τὸ χρήσιμον.

Ἐλάτη μὲν οὖν καὶ πεύκη καὶ κέδρος ὡς ἁπλῶς

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[1] παύονται can hardly be right: Plin. *l.c.* seems to have had a fuller text.

[2] ἐμπλάττει: *cf. de Sens.* 66.

are altogether dry: for the latter give,[1] while the former resist. Wood which is too green closes up again when sawn, and the sawdust catches in the saw's teeth and clogs[2] them; wherefore the teeth of the saw are set alternate ways, to get rid of the sawdust. Wood which is too green is also harder to bore holes in; for the auger's dust is only brought up slowly, because it is heavy; while, if the wood is dry, the air gets warmed by the boring and brings it up readily and at once. On the other hand, wood which is over dry[3] is hard to saw because of its hardness: for it is like sawing through earthenware; wherefore they wet the auger when using it.

However green wood is easier to work with the axe the chisel or the plane; for the chisel gets a better hold and does not slip off. Again softer woods are easier for the axe and for smoothing,[4] and also a better polished surface is obtained. The cornelian cherry is also a very strong wood, and among the rest elm-wood is the strongest; wherefore, as was said,[5] they make the 'hinges' for doors of elm-wood. Manna-ash and beech have very moist wood, for of these they make elastic bedsteads.

Of the woods used in ship-building.

VII. Next we must endeavour to say in a general way, distinguishing the several uses, for which purposes each kind of timber is serviceable, which is of use for ship-building, which for house-building: for these uses extend far and are important.

Now silver-fir, fir and Syrian cedar[6] are, generally

[3] τὰ λίαν ξηρὰ conj. St.; λεῖα καὶ ξηρὰ Ald. H.
[4] Sc. with the carpenter's axe.
[5] 5. 3. 5. [6] See Index.

εἰπεῖν ναυπηγήσιμα· τὰς μὲν γὰρ τριήρεις καὶ τὰ μακρὰ πλοῖα ἐλάτινα ποιοῦσι διὰ κουφότητα, τὰ δὲ στρογγύλα πεύκινα διὰ τὸ ἀσαπές· ἔνιοι δὲ καὶ τὰς τριήρεις διὰ τὸ μὴ εὐπορεῖν ἐλάτης. οἱ δὲ κατὰ Συρίαν καὶ Φοινίκην ἐκ κέδρου· σπανίζουσι γὰρ καὶ πεύκης. οἱ δ' ἐν Κύπρῳ πίτυος· ταύτην γὰρ ἡ νῆσος ἔχει καὶ δοκεῖ κρείττων εἶναι τῆς
2 πεύκης. καὶ τὰ μὲν ἄλλα ἐκ τούτων· τὴν δὲ τρόπιν τριήρει μὲν δρυΐνην, ἵνα ἀντέχῃ πρὸς τὰς νεωλκίας, ταῖς δὲ ὁλκάσι πευκίνην· ὑποτιθέασι δ' ἔτι καὶ δρυΐνην ἐπὰν νεωλκῶσι, ταῖς δ' ἐλάττοσιν ὀξυΐνην· καὶ ὅλως ἐκ τούτου τὸ χέλυσμα.

Οὐχ ἅπτεται δὲ οὐδὲ κατὰ τὴν κόλλησιν ὁμοίως τὸ δρύϊνον τῶν πευκίνων καὶ ἐλατίνων· τὰ μὲν γὰρ πυκνὰ τὰ δὲ μανά, καὶ τὰ μὲν ὅμοια τὰ δ' οὔ. δεῖ δὲ ὁμοιοπαθῆ εἶναι τὰ μέλλοντα συμφύεσθαι καὶ μὴ ἐναντία, καθαπερανεὶ λίθον καὶ ξύλον.

3 Ἡ δὲ τορνεία τοῖς μὲν πλοίοις γίνεται συκαμίνου μελίας πτελέας πλατάνου· γλισχρότητα γὰρ ἔχειν δεῖ καὶ ἰσχύν. χειρίστη δὲ ἡ τῆς πλατάνου· ταχὺ γὰρ σήπεται. ταῖς δὲ τριήρεσιν ἔνιοι καὶ πιτυΐνας ποιοῦσι διὰ τὸ ἐλαφρόν. τὸ δὲ στερέωμα, πρὸς ᾧ τὸ χέλυσμα, καὶ τὰς ἐπωτίδας, μελίας καὶ συκαμίνου καὶ πτελέας· ἰσχυρὰ

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[1] τριήρει conj. W.; τριήρη U; τριήρης MV; τριήρεσι Ald.

[2] ταῖς δ' ἐλάττοσιν ὀξυΐνην conj. W. (τοῖς Sch.); τοῖς μὲν ἐλάττοσιν ὀξύη Ald. *cf.* Plin. 16. 226.

[3] χέλυσμα, a temporary covering for the bottom: so Poll. and Hesych. explain.

speaking, useful for ship-building; for triremes and long ships are made of silver-fir, because of its lightness, and merchant ships of fir, because it does not decay; while some make triremes of it also because they are ill provided with silver-fir. The people of Syria and Phoenicia use Syrian cedar, since they cannot obtain much fir either; while the people of Cyprus use Aleppo pine, since their island provides this and it seems to be superior to their fir. Most parts are made of these woods; but the keel for a trireme[1] is made of oak, that it may stand the hauling; and for merchantmen it is made of fir. However they put an oaken keel under this when they are hauling, or for smaller vessels a keel of beech;[2] and the sheathing[3] is made entirely of this wood.

[4](However oak-wood does not join well with glue on to fir or silver-fir; for the one is of close, the other of open grain, the one is uniform, the other not so; whereas things which are to be made into one piece should be of similar character, and not of opposite character, like wood and stone.)

The work of bentwood[5] for vessels is made of mulberry manna-ash elm or plane; for it must be tough and strong. That made of plane-wood is the worst, since it soon decays. For triremes some make such parts of Aleppo pine because of its lightness. The cutwater,[6] to which the sheathing is attached,[7] and the catheads are made of manna-ash mulberry

[4] This sentence is out of place; its right place is perhaps at the end of § 4.

[5] *τορνεία*; but the word is perhaps corrupt: one would expect the name of some part of the vessel.

[6] *στερέωμα*: apparently the fore part of the keel; = *στεῖρα*.

[7] *πρὸς ᾧ τὸ χέλυσμα* conj. W. after Scal.: *πρόσω· τὸ σχέλυσμα* Ald. (*σχέλομα* M, *χέλυσμα* U) *πρόσω· τὸ δὲ χέλυσμα* mBas.

γὰρ δεῖ ταῦτ' εἶναι. ναυπηγήσιμος μὲν οὖν ὕλη σχεδὸν αὕτη.

4 Οἰκοδομικὴ δὲ πολλῷ πλείων, ἐλάτη τε καὶ πεύκη καὶ κέδρος, ἔτι κυπάριττος δρῦς καὶ ἄρκευθος· ὡς δ' ἁπλῶς εἰπεῖν πᾶσα χρησίμη πλὴν εἴ τις ἀσθενὴς πάμπαν· οὐκ εἰς ταὐτὸ γὰρ πᾶσαι, καθάπερ οὐδ' ἐπὶ τῆς ναυπηγίας. αἱ δ' ἄλλαι πρὸς τὰ ἴδια τῶν τεχνῶν, οἷον σκεύη καὶ ὄργανα καὶ εἴ τι τοιοῦτον ἕτερον. πρὸς πλεῖστα δὲ σχεδὸν ἡ ἐλάτη παρέχεται χρείαν· καὶ γὰρ πρὸς τοὺς πίνακας τοὺς γραφομένους. τεκτονικῇ μὲν οὖν ἡ παλαιοτάτη κρατίστη, ἐὰν ᾖ ἀσαπής· εὐθετεῖ γὰρ ὡς εἰπεῖν πᾶσι χρῆσθαι· ναυπηγικῇ δὲ διὰ τὴν κάμψιν ἐνικμοτέρᾳ ἀναγκαῖον· ἐπεὶ πρός γε τὴν κόλλησιν ἡ ξηροτέρα συμφέρει. ἵσταται γὰρ καινὰ τὰ ναυπηγούμενα καὶ ὅταν συμπαγῇ καθελκυσθέντα συμμύει καὶ στέγει, πλὴν ἐὰν μὴ παντάπασιν ἐξικμασθῇ· τότε δὲ οὐ δέχεται κόλλησιν ἢ οὐχ ὁμοίως.

5 Δεῖ δὲ καὶ καθ' ἕκαστον λαμβάνειν εἰς ποῖα χρήσιμός ἐστιν. ἐλάτη μὲν οὖν καὶ πεύκη, καθάπερ εἴρηται, καὶ πρὸς ναυπηγίαν καὶ πρὸς

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[1] ἐλάτη . . . ἄρκευθος conj. W.; ἐλάτη τε καὶ πεύκη καὶ κέδρος ἔτι κυπάριττος δρῦς πεύκη καὶ κέδρος ἄρκευθος U; ἐλάτη τε καὶ πεύκη καὶ κέδρος καὶ ἄρκευθος Ald.H.: so also MV, omitting καὶ before ἀρκ.

[2] ὡς δ' ἁπλῶς conj. Sch.; ἁπλῶς δ' ὡς Ald.

[3] καινὰ conj. Sch.; καὶ νῦν Ald.

[4] συμπαγῇ conj. W., which he renders 'when it has been glued together'; συμπίῃ Ald. G's reading was evidently different.

and elm; for these parts must be strong. Such then is the timber used in ship-building.

Of the woods used in house-building.

For house-building a much greater variety is used, silver-fir fir and prickly cedar; also cypress oak and Phoenician cedar.[1] In fact, to speak generally,[2] any wood is here of service, unless it is altogether weak: for there are various purposes for which different woods are serviceable, just as there are in ship-building. While other woods are serviceable for special articles belonging to various crafts, such as furniture tools and the like, the wood of silver-fir is of use for almost more purposes than any other wood; for it is even used for painters' tablets. For carpentry the oldest wood is the best, provided that it has not decayed; for it is convenient for almost anyone to use. But for ship-building, where bending is necessary, one must use wood which contains more moisture (though, where glue is to be used, drier wood is convenient). For timber-work for ships is set to stand when it is newly[3] made: then, when it has become firmly united,[4] it is dragged down to the water, and then it closes up and becomes watertight,—unless[5] all the moisture has been dried out of it, in which case it will not take the glue, or will not take it so well.

Of the uses of the wood of particular trees.

But we must consider for what purposes[6] each several wood is serviceable. Silver-fir and fir, as has been said, are suitable both for ship-building house-

[5] πλὴν ἐὰν μὴ conj. W.; π. ἐάν τε M; π. ἐάν γε Ald.

[6] *i.e.* apart from ship-building and house-building, in which *several* woods are used.

οἰκοδομίαν καὶ ἔτι πρὸς ἄλλα τῶν ἔργων, εἰς πλείω δὲ ἡ ἐλάτη. πίτυϊ δὲ χρῶνται μὲν εἰς ἄμφω καὶ οὐχ ἧττον εἰς ναυπηγίαν, οὐ μὴν ἀλλὰ ταχὺ διασήπεται. δρῦς δὲ πρὸς οἰκοδομίαν καὶ πρὸς ναυπηγίαν ἔτι τε πρὸς τὰ κατὰ γῆς κατορυττόμενα. φίλυρα δὲ πρὸς τὰ σανιδώματα τῶν μακρῶν πλοίων καὶ πρὸς κιβώτια καὶ πρὸς τὴν τῶν μέτρων κατασκευήν. ἔχει δὲ καὶ τὸν φλοιὸν χρήσιμον πρός τε τὰ σχοινία καὶ πρὸς τὰς κίστας· ποιοῦσι γὰρ ἐξ αὐτῆς.

6 Σφένδαμνός τε καὶ ζυγία πρὸς κλινοπηγίαν καὶ πρὸς τὰ ζυγὰ τῶν λοφούρων. μίλος δὲ εἰς παρακολλήματα κιβώτοις καὶ ὑποβάθροις καὶ ὅλως τοῖς τοιούτοις. πρῖνος δὲ πρὸς ἄξονας ταῖς μονοστρόφοις ἁμάξαις καὶ εἰς ζυγὰ λύραις καὶ ψαλτηρίοις. ὀξύη δὲ πρὸς ἁμαξοπηγίαν καὶ διφροπηγίαν τὴν εὐτελῆ. πτελέα δὲ πρὸς θυροπηγίαν καὶ γαλεάγρας· χρῶνται δὲ καὶ εἰς τὰ ἁμαξικὰ μετρίως. πηδὸς δὲ εἰς ἄξονάς τε ταῖς ἁμάξαις καὶ εἰς ἕλκηθρα τοῖς ἀρότροις. ἀνδράχλη δὲ ταῖς γυναιξὶν εἰς τὰ περὶ τοὺς ἱστούς. ἄρκευθος δὲ εἰς τεκτονίας καὶ εἰς τὰ ὑπαίθρια καὶ εἰς τὰ κατορυττόμενα κατὰ γῆς διὰ τὸ ἀσαπές.

7 ὡσαύτως δὲ καὶ ἡ Εὐβοϊκὴ καρύα, καὶ πρός γε τὴν κατόρυξιν ἔτι μᾶλλον ἀσαπής. πύξῳ δὲ χρῶνται μὲν πρὸς ἔνια, οὐ μὴν ἀλλ' ἥ γε ἐν τῷ Ὀλύμπῳ γινομένη διὰ τὸ βραχεῖά τε εἶναι καὶ ὀζώδης ἀχρεῖος. τερμίνθῳ δὲ οὐδὲν χρῶνται

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[1] *κίστας*: *cf.* 3. 13. 1 ; perhaps 'hampers,' *cf.* 5. 7. 7.

[2] *παρακολλήματα*: lit. 'things glued on.'

[3] Plin. 16. 229.

[4] *ταῖς μονοστρόφοις ἁμάξαις*: or, perhaps, 'the wheels of

building and also for other kinds of work, but silver-fir is of use for more purposes than fir. Aleppo pine is used for both kinds of building, but especially for ship-building, yet it soon rots. Oak is used for house-building, for ship-building, and also for underground work; lime for the deck-planks of long ships, for boxes, and for the manufacture of measures; its bark is also useful for ropes and writing-cases,[1] for these are sometimes made of it.

Maple and *zygia* are used for making beds and the yokes of beasts of burden: yew for the ornamental work attached[2] to chests and footstools and the like: kermes-oak[3] for the axles of wheelbarrows[4] and the cross-bars of lyres and psalteries: beech for making waggons and cheap carts: elm for making doors and weasel-traps, and to some extent it is also used for waggon work; *pedos*[5] for waggon-axles and the stocks of ploughs: andrachne is used for women for parts of the loom: Phoenician cedar for carpenters' work[6] and for work which is either to be exposed to the air or buried underground, because it does not decay. Similarly the sweet chestnut is used, and it is even less likely to decay if it is used for underground work. Box is used for some purposes; however that which grows on Mount Olympus[7] is useless, because only short pieces can be obtained and the wood[8] is full of knots. Terebinth is not used,[9] except the fruit and the resin.

carts with solid wheels.' *ταῖς* conj. Sch.; *τε καὶ* UMV; *τε καὶ ξυνοστρόφους ἁμάξας* Ald.

[5] *πηδος* (with varying accent) MSS.: probably = *πάδος*, 4. 1. 3; *πύξος* Ald., but see § 7.

[6] *τεκτονίας* can hardly be right. [7] *cf.* 3. 15. 5.

[8] *cf.* 1. 8. 2, of box in general; Plin. 16. 71.

[9] Inconsistent with 5. 3. 2.

πλὴν τῷ καρπῷ καὶ τῇ ῥητίνῃ. οὐδὲ φιλύκῃ πλὴν τοῖς προβάτοις· ἀεὶ γάρ ἐστι δασεῖα. τῇ δὲ ἀφάρκῃ εἰς χάρακάς τε καὶ τὸ καίειν. κηλάστρῳ δὲ καὶ σημύδᾳ πρὸς βακτηρίας. ἔνιοι δὲ καὶ δάφνῃ· τὰς γὰρ γεροντικὰς καὶ κούφας ταύτης ποιοῦσιν. ἰτέᾳ δὲ πρός τε τὰς ἀσπίδας καὶ τὰς κίστας καὶ τὰ κανᾶ καὶ τἆλλα. προσαναλαβεῖν δέ ἐστι καὶ τῶν ἄλλων ἕκαστον ὁμοίως.

8 Διῄρηται δὲ καὶ πρὸς τὰ τεκτονικὰ τῶν ὀργάνων ἕκαστα κατὰ τὴν χρείαν· οἷον σφυρίου μὲν καὶ τερέτριον ἄριστα μὲν γίνεται κοτίνου· χρῶνται δὲ καὶ πυξίνοις καὶ πτελείνοις καὶ μελείνοις· τὰς δὲ μεγάλας σφύρας πιτυΐνας ποιοῦσιν. ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον ἔχει τινὰ τάξιν. καὶ ταῦτα μὲν αἱ χρεῖαι διαιροῦσιν.

VIII. Ἑκάστη δὲ τῆς ὕλης, ὥσπερ καὶ πρότερον ἐλέχθη, διαφέρει κατὰ τοὺς τόπους· ἔνθα μὲν γὰρ λωτὸς ἔνθα δὲ κέδρος γίνεται θαυμαστή, καθάπερ καὶ περὶ Συρίαν· ἐν Συρίᾳ γὰρ ἔν τε τοῖς ὄρεσι διαφέροντα γίνεται τὰ δένδρα τῆς κέδρου καὶ τῷ ὕψει καὶ τῷ πάχει· τηλικαῦτα γάρ ἐστιν ὥστ' ἔνια μὲν μὴ δύνασθαι τρεῖς ἄνδρας περιλαμβάνειν· ἔν τε τοῖς παραδείσοις ἔτι μείζω καὶ καλλίω. φαίνεται δὲ καὶ ἐάν τις ἐᾷ καὶ μὴ τέμνῃ τόπον οἰκεῖον ἕκαστον ἔχον γίνεσθαι θαυμαστὸν τῷ μήκει καὶ πάχει. ἐν Κύπρῳ γοῦν οὐκ ἔτεμνον οἱ βασιλεῖς, ἅμα μὲν τηροῦντες καὶ ταμιευόμενοι, ἅμα

[1] Inconsistent with 5. 6. 2. *φιλυρέα* conj. Sch.
[2] *καὶ σημύδα* conj. Sch.; *καὶ μυῖα* U; *καὶ μύα* Ald. *cf.* 3. 14. 4.

[1] Alaternus is only useful for feeding sheep; for it is always leafy. Hybrid arbutus is used for making stakes and for burning: holly and Judas-tree[2] for walking-sticks: some also use bay for these; for of this[3] they make light sticks and sticks for old men. Willow is used for shields hampers baskets and the like. We might in like manner add the several uses of the other woods.

[4] Distinction is also made between woods according as they are serviceable for one or other of the carpenter's tools: thus hammers and gimlets are best made of wild olive, but box elm and manna-ash are also used, while large mallets are made of Aleppo pine. In like manner there is a regular practice about each of the other tools. Such are the differences as to the uses of various woods.

Of the localities in which the best timber grows.

VIII. Each kind of timber, as was said before, differs according to the place[5] where it grows; in one place nettle-tree, in another the cedar is remarkably fine, for instance in Syria; for in Syria and on its mountains the cedars grow to a surpassing height and thickness: they are sometimes so large that three men cannot embrace the tree. And in the parks they are even larger and finer. It appears that any tree, if it is left alone in its natural position and not cut down, grows to a remarkable height and thickness. For instance in Cyprus the kings used not to cut the trees, both because they took great care of them and hus-

[3] *ταύτης* conj. H.; *ταύτας* UMVAld.
[4] Plin. 16. 230.
[5] *τόπους* conj. Scal. from G; *πόδας* Ald.

δὲ καὶ διὰ τὸ δυσκόμιστον εἶναι. μῆκος μὲν ἦν τῶν εἰς τὴν ἐνδεκήρη τὴν Δημητρίου τιμηθέντων τρισκαιδεκαόργυιον, αὐτὰ δὲ τὰ ξύλα τῷ μήκει θαυμαστὰ καὶ ἄοζα καὶ λεῖα. μέγιστα δὲ καὶ παρὰ πολὺ τὰ ἐν τῇ Κύρνῳ φασὶν εἶναι· τῶν γὰρ ἐν τῇ Λατίνῃ καλῶν γινομένων ὑπερβολῇ καὶ τῶν ἐλατίνων καὶ τῶν πευκίνων—μείζω γὰρ ταῦτα καὶ καλλίω τῶν Ἰταλικῶν—οὐδὲν εἶναι
2 πρὸς τὰ ἐν τῇ Κύρνῳ. πλεῦσαι γάρ ποτε τοὺς Ῥωμαίους βουλομένους κατασκευάσασθαι πόλιν ἐν τῇ νήσῳ πέντε καὶ εἴκοσι ναυσί, καὶ τηλικοῦτον εἶναι τὸ μέγεθος τῶν δένδρων ὥστε εἰσπλέοντας εἰς κόλπους τινὰς καὶ λιμένας διασχισθεῖσι τοῖς ἱστοῖς ἐπικινδυνεῦσαι. καὶ ὅλως δὲ πᾶσαν τὴν νῆσον δασεῖαν καὶ ὥσπερ ἠγριωμένην τῇ ὕλῃ· δι' ὃ καὶ ἀποστῆναι τὴν πόλιν οἰκίζειν· διαβάντας δέ τινας ἀποτεμέσθαι πάμπολυ πλῆθος ἐκ τόπου βραχέος, ὥστε τηλικαύτην ποιῆσαι σχεδίαν ἣ ἐχρήσατο πεντήκοντα ἱστίοις· οὐ μὴν ἀλλὰ διαπεσεῖν αὐτὴν ἐν τῷ πελάγει. Κύρνος μὲν οὖν εἴτε διὰ τὴν ἄνεσιν εἴτε καὶ τὸ ἔδαφος καὶ τὸν ἀέρα πολὺ διαφέρει τῶν ἄλλων.

3 Ἡ δὲ τῶν Λατίνων ἔφυδρος πᾶσα· καὶ ἡ μὲν πεδεινὴ δάφνην ἔχει καὶ μυρρίνους καὶ ὀξύην θαυμαστήν· τηλικαῦτα γὰρ τὰ μήκη τέμνουσι ὥστ' εἶναι διανεκῶς τῶν Τυρρηνίδων ὑπὸ τὴν τρόπιν· ἡ δὲ ὀρεινὴ πεύκην καὶ ἐλάτην. τὸ δὲ

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[1] Demetrius Poliorcetes. *cf.* Plut. *Demetr.* 43; Plin. 16. 203.

[2] *ἐπικινδυνεῦσαι* conj. W.; *ἐπὶ τὸν πύκνον* Ald.; so U, but *πυκνον*.

[3] *i.e.* against the overhanging trees. ? *ἱστίοις*, to which *διασχ.* is more appropriate.

banded them, and also because the transport of the timber was difficult. The timbers cut for Demetrius'[1] ship of eleven banks of oars were thirteen fathoms long, and the timbers themselves were without knots and smooth, as well as of marvellous length. But largest of all, they say, are the trees of Corsica; for whereas silver-fir and fir grow in Latium to a very great size, and are taller and finer than the silver-firs and firs of South Italy, these are said to be nothing to the trees of Corsica. For it is told how the Romans once made an expedition to that island with twenty-five ships, wishing to found a city there; and so great was the size of the trees that, as they sailed into certain bays and creeks, they got into difficulties[2] through breaking their masts.[3] And in general it is said that the whole island is thickly wooded and, as it were, one wild forest; wherefore the Romans gave up the idea of founding their city: however some of them made an excursion[4] into the island and cleared away a large quantity of trees from a small area, enough to make a raft with fifty sails;[5] but this broke up in the open sea. Corsica then, whether because of its uncultivated condition or because of its soil and climate, is very superior in trees to other countries.

The country of the Latins is all well watered; the lowland part contains bay, myrtle, and wonderful beech: they cut timbers of it of such a size that they will run the whole length[6] of the keel of a Tyrrhenian vessel. The hill country produces fir and silver-fir. The district called by Circe's name is, it

[4] διαβάντας δέ τινας conj. St. from G; διαβάντα δέ τινα Ald. H.
[5] ἣ ἐχρήσατο πεντ. ἱστ. conj. Sch.; ᾗ ἐχρήσαντο οἱ Ald. H.
[6] διατεκῶς conj. Sch.; διὰ νεὼς Ald.

Κιρκαῖον καλούμενον εἶναι μὲν ἄκραν ὑψηλήν, δασεῖαν δὲ σφόδρα καὶ ἔχειν δρῦν καὶ δάφνην πολλὴν καὶ μυρρίνους. λέγειν δὲ τοὺς ἐγχωρίους ὡς ἐνταῦθα ἡ Κίρκη κατῴκει καὶ δεικνύναι τὸν τοῦ Ἐλπήνορος τάφον, ἐξ οὗ φύονται μυρρίναι καθάπερ αἱ στεφανώτιδες τῶν ἄλλων ὄντων μεγάλων μυρρίνων. τὸν δὲ τόπον εἶναι καὶ τοῦτον νέαν πρόσθεσιν, καὶ πρότερον μὲν οὖν νῆσον εἶναι τὸ Κιρκαῖον, νῦν δὲ ὑπὸ ποταμῶν τινων προσκεχῶσθαι καὶ εἶναι ἠϊόνα. τῆς δὲ νήσου τὸ μέγεθος περὶ ὀγδοήκοντα σταδίους. καὶ τὰ μὲν τῶν τόπων ἴδια πολλὴν ἔχει διαφοράν, ὥσπερ εἴρηται πολλάκις.

IX. Τὸ δὲ καὶ πρὸς τὴν πύρωσιν πῶς ἑκάστη τῆς ὕλης ἔχει λεκτέον ὁμοίως καὶ πειρατέον λαβεῖν. ἄνθρακες μὲν οὖν ἄριστοι γίνονται τῶν πυκνοτάτων, οἷον ἀρίας δρυὸς κομάρου· στερεώτατοι γάρ, ὥστε πλεῖστον χρόνον ἀντέχουσι καὶ μάλιστα ἰσχύουσι· δι' ὃ καὶ ἐν τοῖς ἀργυρείοις τούτοις χρῶνται πρὸς τὴν πρώτην τούτων ἕψησιν. χείριστοι δὲ τούτων οἱ δρύϊνοι· γεωδέστατοι γάρ· χείρους δὲ καὶ οἱ τῶν πρεσβυτέρων τῶν νέων, καὶ μάλιστα οἱ τῶν γερανδρύων διὰ ταὐτό· ξηρότατοι γάρ, δι' ὃ καὶ πηδῶσι καιόμενοι· δεῖ δὲ ἔνικμον εἶναι.

2 Βέλτιστοι δὲ οἱ τῶν ἐν ἀκμῇ καὶ μάλιστα οἱ

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[1] *cf.* Hom. *Od.* 10. 552 foll., 11. 51–80, 12. 8–15; Plin. 15. 119.

[2] *νέαν πρόσθεσιν* conj. Sch.; *εἰς ἀνδρὸς θέσιν* Ald.

is said, a lofty promontory, but very thickly wooded, producing oak, bay in abundance, and myrtle. There, according to the natives, dwelt Circe, and they shew Elpenor's tomb,[1] on which grow myrtles like those used for garlands, though other kinds of myrtle are large trees. Further it is said that the district is a recent addition[2] to the land, and that once this piece of land was an island, but now the sea has been silted up by certain streams and it has become united to the coast, and the size of the 'island'[3] is about eighty furlongs in circumference. There is[4] then much difference in trees, as has been said repeatedly, which is due to the individual character of particular districts.

Of the uses of various woods in making fire: charcoal, fuel, fire-sticks.

IX. Next we must state in like manner and endeavour to determine the properties of each kind of timber in relation to making fire. The best charcoal is made from the closest wood, such as *aria* (holm-oak) oak arbutus; for these are the most solid, so that they last longest and are the strongest; wherefore these are used in silver-mines for the first smelting of the ore. Worst of the woods mentioned is oak, since it contains most mineral matter,[5] and the wood of older trees is inferior to that of the younger, and for the same reason that of really old trees[6] is specially bad. For it is very dry, wherefore it sputters as it burns; whereas wood for charcoal should contain sap.

The best charcoal comes from trees in their prime,

[3] *cf.* Plin. 3. 57. [4] ἔχει conj. Sch.; εἶναι Ald.
[5] *i.e.* and so makes much ash. [6] *cf.* 2. 7. 2.

τῶν κολοβῶν· συμμέτρως γὰρ ἔχουσι τῷ πυκνῷ καὶ γεώδει καὶ τῷ ὑγρῷ· βελτίους δὲ καὶ ἐκ τῶν εὐείλων καὶ ξηρῶν καὶ προσβόρρων ἢ ἐκ τῶν παλισκίων καὶ ὑγρῶν καὶ πρὸς νότον· καὶ εἰ ἐνικμοτέρας ὕλης, πυκνῆς· ὑγροτέρα γὰρ ἡ πυκνή. καὶ ὅλως, ὅσα ἢ φύσει ἢ διὰ [τὸν] τόπον ξηρότερον πυκνότερα, ἐξ ἁπάντων βελτίω διὰ τὴν αὐτὴν αἰτίαν. χρεία δὲ ἄλλων ἄλλη· πρὸς ἔνια γὰρ ζητοῦσι τοὺς μαλακούς, οἷον ἐν τοῖς σιδηρείοις τοὺς τῆς καρύας τῆς Εὐβοϊκῆς, ὅταν ἤδη κεκαυμένος ᾖ, καὶ ἐν τοῖς ἀργυρείοις τοὺς πιτυΐνους.
3 χρῶνται δὲ καὶ αἱ τέχναι τούτοις. ζητοῦσι δὲ καὶ οἱ χαλκεῖς τοὺς πευκίνους μᾶλλον ἢ δρυΐνους· καίτοι ἀσθενέστεροι ἀλλ' εἰς τὴν φύσησιν ἀμείνους ὡς ἧσσον καταμαραινόμενοι· ἔστι δὲ ἡ φλὸξ ὀξυτέρα τούτων. τὸ δὲ ὅλον ὀξυτέρα φλὸξ καὶ ἡ τούτων καὶ ἡ τῶν ξύλων τῶν μανῶν καὶ κούφων καὶ ἡ τῶν αὔων· ἡ δ' ἐκ τῶν πυκνῶν καὶ χλωρῶν νωθεστέρα καὶ παχυτέρα· πασῶν δὲ ὀξυτάτη ἡ ἐκ τῶν ὑλημάτων· ἄνθρακες δὲ ὅλως οὐ γίνονται διὰ τὸ μὴ ἔχειν τὸ σωματῶδες.

4 Τέμνουσι δὲ καὶ ζητοῦσι εἰς τὰς ἀνθρακιὰς τὰ

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[1] κολοβῶν conj. Palm.; κολλάβων U; κολάβων Ald.

[2] δὲ καὶ ἐκ τῶν conj. W.; δὲ καὶ οἱ τῶν UMVP; δὲ οἱ τῶν Ald.H.

[3] καὶ εἰ ἐνικμοτέρας conj. W.; καὶ οἱ ἐνακμοτέρας U; καὶ ἡ ἐν ἀκμητέρας MV; καὶ οἱ ἐν ἀκμητέρας Ald.Bas.Cam. The sense seems to require ὑγροτέρας for ἐνικμοτέρας and ἐνικμοτέρα for ὑγροτέρα. G seems to have had a fuller text.

[4] *i.e.* from growing in a damper place. *cf.* 5. 9. 4.

and especially from trees which have been topped[1]: for these contain in the right proportion the qualities of closeness admixture of mineral matter and moisture. Again better charcoal comes from trees[2] in a sunny dry position with a north aspect than from those grown in a shady damp position facing south. Or, if the wood[3] used contains a good deal of moisture,[4] it should be of close texture; for such wood contains more sap.[5] And, for the same reason, that which is of closer texture either from its own natural character or because it was grown in a drier spot,[6] is, whatever the kind of tree, better.[7] But different kinds of charcoal are used for different purposes: for some uses men require it to be soft; thus in iron-mines they use that which is made of sweet chestnut when the iron has been already smelted, and in silver-mines they use charcoal of pine-wood: and these kinds are also used by the crafts. Smiths[8] require charcoal of fir rather than of oak: it is indeed not so strong, but it blows up better into a flame, as it is less apt to smoulder: and the flame from these woods is fiercer. In general the flame is fiercer not only from these but from any wood which is of open texture and light, or which is dry: while that from wood which is of close texture or green is more sluggish and dull. The fiercest flame of all is given by brushwood; but charcoal cannot be made from it at all, since it has not the necessary substance.

They cut and require for the charcoal-heap straight

[5] *cf.* § 1 *ad fin.*

[6] *ξηρότερον* conj. W.; *ξηρότερα* UMV; *πυκνότερα ξηρότερα* Ald. I have bracketed *τὸν*.

[7] *βελτίω* conj. Sch.; *βελτίων* UM; *βέλτιον* Ald.H.

[8] *cf.* Plin. 16. 23.

εὐθέα καὶ τὰ λεῖα· δεῖ γὰρ ὡς πυκνότατα συνθεῖναι πρὸς τὴν κατάπνιξιν. ὅταν δὲ περιαλείψωσι τὴν κάμινον, ἐξάπτουσι παρὰ μέρος παρακεντοῦντες ὀβελίσκοις. εἰς μὲν τὴν ἀνθρακιὰν τὰ τοιαῦτα ζητοῦσι.

Δύσκαπνα δὲ τῷ γένει μὲν ὅλως τὰ ὑγρά· καὶ τὰ χλωρὰ διὰ τοῦτο δύσκαπνα. λέγω δὲ τὰ ὑγρὰ τὰ ἕλεια, οἷον πλάτανον ἰτέαν λεύκην αἴγειρον· ἐπεὶ καὶ ἡ ἄμπελος ὅτε ὑγρὰ δύσκαπνος. ἐκ δὲ τῆς ἰδίας φύσεως ὁ φοῖνιξ, ὃν δὴ καὶ μάλιστά τινες ὑπειλήφασι δύσκαπνον· ὅθεν καὶ Χαιρήμων ἐποίησε "τοῦ τε δυσκαπνοτάτου φοίνικος ἐκ γῆς
5 ῥιζοφοιτήτους φλέβας." δριμύτατος δὲ ὁ καπνὸς συκῆς καὶ ἐρινεοῦ καὶ εἴ τι ἄλλο ὀπῶδες· αἰτία δὲ ἡ ὑγρότης· φλοϊσθέντα δὲ καὶ ἀποβρεχθέντα ἐν ὕδατι ἐπιρρύτῳ καὶ μετὰ ταῦτα ξηρανθέντα πάντων ἀκαπνότατα καὶ φλόγα μαλακωτάτην ἀνίησιν, ἅτε καὶ τῆς οἰκείας ὑγρότητος ἐξῃρημένης. δριμεῖα δὲ καὶ ἡ τέφρα καὶ ἡ κονία ἡ ἀπ' αὐτῶν. μάλιστα δέ φασι τὴν ἀπὸ τῆς ἀμυγδαλῆς.

6 Πρὸς δὴ τὰς καμινίας καὶ τὰς ἄλλας τέχνας ἄλλη ἄλλοις χρησίμη. ἐμπυρεύεσθαι δὲ ἄριστα συκῇ καὶ ἐλάᾳ· συκῇ μέν, ὅτι γλίσχρον τε καὶ μανόν, ὥστε ἕλκει τε καὶ οὐ δίεισιν· ἐλάᾳ δέ, ὅτι πυκνὸν καὶ λιπαρόν.

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[1] λεῖα conj. Scal. from G ; νέα Ald.

[2] With sods. *cf.* Plin., *l.c.*, who seems to have had a fuller text.

[3] An Athenian tragic poet. Scal. restores the quotation

smooth[1] billets: for they must be laid as close as possible for the smouldering process. When they have covered[2] the kiln, they kindle the heap by degrees, stirring it with poles. Such is the wood required for the charcoal-heap.

In general damp wood makes an evil smoke, and for this reason green wood does so: I mean the damp woods which grow in marshy ground, such as plane willow abele black poplar: for even vine-wood, when it is damp, gives an evil smoke. So does palm-wood of its own nature, and some have supposed it to give the most evil smoke of all: whence Chaeremon[3] speaks of "Veins issuing underground from roots of palm with its malodorous smoke." Most pungent is the smoke of fig-wood, whether wild or cultivated, and of any tree which has a curdling juice; the reason lies in the sap; when such wood has been barked and soaked in running water and then dried, it gives as little smoke as any other, and sends up a very soft[4] flame, since its natural moisture also has been removed. The cinders and ashes of such wood are also pungent, and especially, they say, those of almond-wood.

For the crafts requiring a furnace and for other crafts various woods are serviceable according to circumstances.[5] For kindling fig and olive are best: fig, because it is tough and of open texture, so that it easily catches fire and does not let it through,[6] olive, because it is of close texture and oily.

thus: *τοῦ τε δυσκαπνωτάτου | φοίνικος ἐκ γῆς ῥιζοφοιτήτους φλέβας* (*ῥιζοφοιτύτους* conj. Schneidewin).

[4] *i.e.* not sputtering.

[5] *καὶ . . . χρησίμη* conj. W.; *τέχναις ἀλλήλοις χρησίμη* U; *τ. ἀλλήλας χρ.* MV; *τέχνη ἄλλη ἐστι χρ.* P; *τ. ἀλλήλοις ἐστὶ χρησίμη* Ald.

[6] *i.e.* burn out quickly.

Πυρεῖα δὲ γίνεται μὲν ἐκ πολλῶν, ἄριστα δέ, ὥς φησι Μενέστωρ, ἐκ κιττοῦ· τάχιστα γὰρ καὶ πλεῖστον ἀναπνεῖ. πυρεῖον δέ φασιν ἄριστον μὲν ἐκ τῆς ἀθραγένης καλουμένης ὑπό τινων· τοῦτο δ' ἐστὶ δένδρον ὅμοιον τῇ ἀμπέλῳ καὶ τῇ οἰνάνθῃ τῇ ἀγρίᾳ· ὥσπερ ἐκεῖνα καὶ τοῦτο ἀνα-
7 βαίνει πρὸς τὰ δένδρα. δεῖ δὲ τὴν ἐσχάραν ἐκ τούτων ποιεῖν τὸ δὲ τρύπανον ἐκ δάφνης· οὐ γὰρ ἐκ ταὐτοῦ τὸ ποιοῦν καὶ πάσχον, ἀλλ' ἕτερον εὐθὺ δεῖ κατὰ φύσιν, καὶ τὸ μὲν δεῖ παθητικὸν εἶναι τὸ δὲ ποιητικόν. οὐ μὴν ἀλλὰ καὶ ἐκ τοῦ αὐτοῦ γίνεται καί, ὥς γέ τινες ὑπολαμβάνουσιν, οὐδὲν διαφέρει. γίνεται γὰρ ἐκ ῥάμνου καὶ πρίνου καὶ φιλύρας καὶ σχεδὸν ἐκ τῶν πλείστων πλὴν ἐλάας· ὃ καὶ δοκεῖ ἄτοπον εἶναι· καὶ γὰρ σκληρότερον καὶ λιπαρὸν ἡ ἐλάα· τοῦτο μὲν οὖν ἀσύμμετρον ἔχει δῆλον ὅτι τὴν ὑγρότητα πρὸς τὴν πύρωσιν. ἀγαθὰ δὲ τὰ ἐκ ῥάμνου· ποιεῖ δὲ τοῦτο καὶ τὴν ἐσχάραν χρηστήν· πρὸς γὰρ τῷ ξηρὰν καὶ ἄχυμον εἶναι δεῖ καὶ μανοτέραν, ἵν' ἡ τρίψις ἰσχύῃ, τὸ δὲ τρύπανον ἀπαθέστερον· δι' ὃ τὸ τῆς δάφνης ἄριστον· ἀπαθὲς γὰρ ὂν ἐργάζεται τῇ δριμύτητι. πάντα δὲ τὰ πυρεῖα βορείοις μὲν θᾶττον καὶ μᾶλλον ἐξάπτεται, νοτίοις δὲ ἧττον· καὶ ἐν μὲν τοῖς μετεώροις μᾶλλον, ἐν δὲ τοῖς κοίλοις ἧττον.

8 Ἀνίει δὲ τῶν ξύλων τὰ κέδρινα καὶ ἁπλῶς ὧν

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[1] π. δὲ γίνεται μὲν conj. Sch.; π. μὲν γίνεται δὲ UMVAld.
[2] *cf.* 1. 2. 3 n.
[3] κιττοῦ conj. Bod. from *de igne* 64, Plin. 16. 208; καρύου Ald.
[4] πυρεῖον conj. Salm.; πυροὶ UMVAld.

Fire-sticks are made[1] from many kinds of wood, but best, according to Menestor,[2] from ivy[3]: for that flares up most quickly and freely. They say also that a very good fire-stick[4] is made of the wood which some call traveller's joy; this is a tree like the vine or the 'wild vine,' which, like these, climbs up trees. The stationary piece[5] should be made of one of these, the drill of bay; for the active and passive parts of the apparatus should not be of the same wood, but different in their natural properties to start with, one being of active, the other of passive character. Nevertheless they are sometimes made of the same wood, and some suppose that it makes no difference. They are made in fact of buckthorn kermes-oak lime and almost any wood except olive; which seems surprising, as olive-wood is rather hard and oily; however it is plainly its moisture which makes it less suitable for kindling. The wood of the buckthorn is also good, and it makes a satisfactory stationary piece; for, besides being dry and free from sap it is necessary that this should also be of rather open texture, that the friction may be effectual; while the drill should be one which gets little worn by use. And that is why one made of bay is best; for, as it is not worn by use, it is effective through its biting quality. All fire-sticks take fire quicker and better in a north than in a south wind, and better in an exposed spot than in one which is shut in.

Some woods, such as prickly cedar, exude[6] moisture, and, generally speaking, so do those

[5] *i.e.* the piece of wood to be bored. *cf. de igne, l.c.*
[6] *ἀνίει.* *?ἀνιδίει.*

ἐλαιώδης ἡ ὑγρότης· δι' ὃ καὶ τὰ ἀγάλματά φασιν ἰδίειν ἐνίοτε· ποιοῦσι γὰρ ἐκ τούτων. ὃ δὲ καλοῦσιν οἱ μάντεις Εἰλειθυίας ἄφεδρον, ὑπὲρ οὗ καὶ ἐκθύονται, πρὸς τοῖς ἐλατίνοις γίνεται συνισταμένης τινὸς ὑγρότητος, τῷ σχήματι μὲν στρογγύλον μέγεθος δὲ ἡλίκον ἄπιον ἢ καὶ μικρῷ μεῖζον ἢ ἔλαττον. ἐκβλαστάνει δὲ μάλιστα τὰ ἐλάϊνα καὶ ἀργὰ κείμενα καὶ εἰργασμένα πολλάκις, ἐὰν ἰκμάδα λαμβάνῃ καὶ ἔχῃ τόπον νοτερόν· ὥσπερ ἤδη τις στροφεὺς τῆς θύρας ἐβλάστησε, καὶ εἰς κυλίκιον πλίνθινον τεθεῖσα κώπη ἐν πήλῳ.

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[1] *cf. C.P.* 5. 4. 4. οἱ μάντεις . . . ἐλατίνοις conj. Lobeck.; οἱ λεῖαν . . . τοῖς ἑκατίνοις U; οἱλείαν . . . τοὺς ἐκματίνοις V; οἱ λεῖαν τῆς εἰληθήας . . . τοῖς ἐκματίνοις M; οἱ λεῖαν τῆς ἀληθυίας ἔφάιδρον . . . τοὺς ἑκατίνους P_2; ἱλεῖαν τῆς εἰληθυίας ἔφυδρον . . . τοὺς ἑκατίνους Ald.

whose sap is of an oily character; and this is why statues are sometimes said to 'sweat'; for they are made of such woods. That which seers call the *menses* of Eileithuia,'[1] and for the appearance of which they make atonement,[2] forms on the wood of the silver-fir when some moisture gathers on it: the formation is round[3] in shape, and in size about as large as a pear, or a little larger or smaller. Olive-wood is more apt than other woods to produce shoots even when lying idle or made into manufactured articles; this it often does, if it obtains moisture and lies in a damp place; thus the socket of a door-'hinge'[4] has been known to shoot, and also an oar which was standing in damp earth in an earthenware vessel.[5]

[2] *i.e.* as a portent. *cf. Char.* 16. 2.

[3] *στρόγγυλον* conj. Sch.; *στροργγύλης* UMVP$_2$Ald.

[4] *cf.* 5. 6. 4; Plin. 16. 230.

[5] *πλινθ. τεθ. κώπη ἐν πήλῳ* conj. Spr.; *πλίνθινον τεθεὶς τῇ κώπῃ πηλός* P$_2$Ald.H.

ΘΕΟΦΡΑΣΤΟΥ
ΠΕΡΙ ΦΥΤΩΝ ΙΣΤΟΡΙΑΣ

Z

I. Περὶ μὲν οὖν δένδρων καὶ θάμνων εἴρηται πρότερον· ἑπόμενον δ' εἰπεῖν περί τε τῶν φρυγανικῶν καὶ ποιωδῶν καὶ εἴ τινες ἐν τούτοις ἕτεραι συμπεριλαμβάνονται φύσεις· οἷον ἥ γε σιτηρὰ ποιώδης ἐστί.

Πρῶτον δὲ λέγωμεν περὶ τῆς φρυγανικῆς· αὕτη γὰρ ἐγγυτέρω τῶν προειρημένων διὰ τὸ ξυλώδης εἶναι. πανταχοῦ μὲν οὖν ἴσως αἰεὶ τὸ ἄγριον τοῦ ἡμέρου πλεῖον, εἰ δὲ μή, περί γε τὴν φρυγανικὴν οὐσίαν· ὀλίγον γὰρ τὸ ἥμερον αὐτῆς, ὅπερ σχεδὸν ἐν τοῖς στεφανωτικοῖς ἐστιν, οἷον ῥοδωνία ἰωνία διόσανθος ἀμάρακος ἡμεροκαλλές, ἔτι δὲ ἔρπυλλος σισύμβριον ἑλένιον ἀβρότονον. ἅπαντα γὰρ ταῦτα ξυλώδη καὶ μικρόφυλλα, δι'
2 ὃ καὶ φρυγανικά. καὶ ἐπὶ τῶν λαχανηρῶν δ'

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[1] *cf.* 6. 6. 1.
[2] This hardly corresponds to the definition of *φρύγανα*

THEOPHRASTUS

ENQUIRY INTO PLANTS

BOOK VI

Of Under-shrubs.

Of the classification of under-shrubs: the wild kinds: the chief distinction that between spinous and spineless.

I. We have spoken already of trees and shrubs, and next we must speak of under-shrubs and herbaceous plants and of any other natural classes which are included with these; for instance, cereals come under herbaceous plants.

But first let us tell of under-shrubs, for this class comes near those mentioned above because of its woody character. Now it may be said that with all plants the wild kinds are more abundant than the cultivated, and this is certainly true of the under-shrubs. For the cultivated kinds of this class[1] are not numerous, and consist almost entirely of coronary plants, as rose gilliflower carnation sweet marjoram martagon lily, to which may be added tufted thyme bergamot-mint calamint southernwood. For all these are woody and have small leaves; wherefore[2] they are classed as under-shrubs. This class covers

given in 1, 3. 1, nor do some of the plants here mentioned come under the description. St. considers the text defective.

ὁμοίως, οἷον ῥάφανος πήγανον καὶ ὅσα παραπλήσια τούτοις ἐστίν. ὑπὲρ ὧν οὐχ ἧττον ἴσως ἁρμόττει κατὰ τὴν οἰκείαν προσηγορίαν εἰπεῖν, ὅταν περὶ στεφανωμάτων καὶ λαχάνων ποιώμεθα μνείαν. νῦν δὲ πρῶτον περὶ τῶν ἀγρίων λέγωμεν. ἔστιν αὐτῶν εἴδη καὶ μέρη πλείω, ἃ δεῖ διαιρεῖν καὶ τοῖς καθ' ἕκαστον γένος καὶ τοῖς ὅλοις εἴδεσι.

Μεγίστην δ' ἄν τις λάβοι διαφορὰν τῶν ὅλων γενῶν, ὅτι τὰ μὲν ἀνάκανθα τὰ δὲ ἀκανθώδη τυγχάνει. πάλιν δ' ἐν ἑκατέρῳ τούτων πολλαὶ διαφοραὶ γενῶν καὶ εἰδῶν, ὑπὲρ ὧν καθ' ἑκάτερα πειρατέον εἰπεῖν.

3 Τῶν ἀκανθικῶν δὴ τὰ μὲν ἁπλῶς εἰσιν ἄκανθαι, ὥσπερ ἀσφάραγος καὶ σκορπίος· οὐ γὰρ ἔχουσι φύλλον οὐδὲν παρὰ τὴν ἄκανθαν. τὰ δὲ φυλλάκανθα, καθάπερ ἄκανος ἠρύγγιον κνῆκος· ταῦτα γὰρ καὶ τὰ τοιαῦτα ἐπὶ τῶν φύλλων ἔχει τὴν ἄκανθαν, δι' ὃ καὶ φυλλάκανθα καλεῖται. τὰ δὲ καὶ παρὰ τὴν ἄκανθαν ἕτερον ἔχει φύλλον, ὥσπερ ἡ ὀνωνὶς καὶ ὁ τρίβολος καὶ ὁ φέως, ὃν δή τινες καλοῦσι στοιβήν. ὁ δὲ τρίβολος καὶ περικαρπιάκανθός ἐστιν· ἔχει γὰρ ἀκάνθας ἐν τῷ περικαρπίῳ, δι' ὃ καὶ τοῦτο ἴδιον πρὸς ἅπαντα ὡς εἰπεῖν· ἐπεὶ πτορθάκανθά γε πολλὰ καὶ τῶν δένδρων καὶ τῶν θαμνωδῶν ἐστιν, οἷον ἀχρὰς ῥόα παλίουρος βάτος ῥοδωνία κάππαρις. ἐν μὲν οὖν τοῖς ἀκανθικοῖς ταύτας ἄν τις ὡς εἰπεῖν τύπῳ λάβοι τὰς διαφοράς.

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[1] ἔστιν . . . εἴδεσι : text needlessly altered by Sch. and W. Sch. himself shews that T. uses εἶδος and γένος almost indiscriminately. Here τῶν ὅλων γενῶν means the same as τοῖς

also pot-herbs, such as cabbage rue and others like them. Of these it is perhaps more appropriate to speak under their proper designation, that is, when we come to make mention of coronary plants and pot-herbs. Now let us first speak of the wild kinds. Of these are several classes and sub-divisions, which we must distinguish by the characteristics of each sub-division as well as by those of each class taken as a whole.[1]

The most important difference distinguishing class from class which one could find is that between the spineless and the spinous kinds. Again under each of these two heads there are many differences distinguishing kinds and forms, of which we must endeavour to speak severally.

[2] Of spinous kinds some just consist of spines, as asparagus and *skorpios*; for these have no leaves except their spines. Then there are the spinous-leaved plants, as thistle eryngo safflower; these and the like have their spines on the leaves, whence their name. Others again have leaves as well as their spines, as rest-harrow caltrop and *pheos*,[3] which some call *stoibe*. Caltrop is also[4] spinous-fruited, having spines on the fruit-vessel. Wherefore this peculiarity marks it off from almost all other plants; though many trees and shrubs have spines on the shoots, as wild pear pomegranate Christ's thorn bramble rose caper. Such[5] are the general distinctions which may be made among spinous plants.

ὅλοις εἴδεσι; and below γενῶν and εἰδῶν *both* refer to the smaller divisions called μέρη above. [2] Plin. 21. 91.

[3] ὁ φέως ὄν conj. Sch.; ὁ φλεὼς ὁ Ald.H.; καὶ ὃ δή τινες καλ. στ. P_2. *cf.* 6. 5. 1 and Index.

[4] καὶ περικαρπάκανθος conj. Sch.; καὶ ἡ περικαρπία φυλλάκανθον UMVAld. *cf.* 6. 5. 3. [5] οὖν add. Sch.

4 Ἐν δὲ τοῖς ἀνακάνθοις οὐκ ἔστιν οὕτως διαλαβεῖν τοῖς γένεσιν· ἡ γὰρ τῶν φύλλων ἀνωμαλία μεγέθει καὶ μικρότητι καὶ σχήμασιν ἄπειρος καὶ ἀσαφής· ἀλλὰ δεῖ πειρᾶσθαι κατ' ἄλλον τρόπον διαιρεῖν. πλείω δέ ἐστι τὰ γένη τὰ τούτων καὶ διαφορὰς ἔχοντα μεγάλας, οἷον κίσθος μήλωθρον ἐρευθεδανὸν σπειραία κνέωρον ὀρίγανος θύμβρα σφάκος ἐλελίσφακος πράσιον κόνυζα μελισσόφυλλον ἕτερα τοιαῦτα· πρὸς τούτοις ἔτι τὰ ναρθηκώδη καὶ ἐννευρόκαυλα, καθάπερ μάραθον ἱππομάραθον ναρθηκία νάρθηξ καὶ τὸ καλούμενον ὑπό τινων μυοφόνον καὶ ὅσα ὅμοια τούτοις. ἅπαντα γὰρ ἄν τις καὶ ταῦτα καὶ ὅλως εἴ τι ναρθηκῶδές ἐστι τῆς φρυγανικῆς θείη φύσεως.

II. Εἴδη δὲ καὶ διαφοραὶ καθ' ἕκαστον τῶν εἰρημένων εἰσὶ τῶν μὲν φανερώτεραι τῶν δὲ ἀφανέστεραι. καὶ γὰρ κίσθου δύο γένη διαιροῦσι, τὸ μὲν ἄρρεν τὸ δὲ θῆλυ, τῷ τὸ μὲν μεῖζον καὶ σκληρότερον καὶ λιπαρώτερον εἶναι καὶ τὸ ἄνθος ἐπιπορφυρίζον· ἄμφω δὲ ὅμοια τοῖς ἀγρίοις ῥόδοις, πλὴν ἐλάττω καὶ ἄοσμα.

2 Δύο δὲ εἴδη καὶ τοῦ κνεώρου· ὁ μὲν γὰρ λευκὸς ὁ δὲ μέλας. ἔχει δὲ ὁ μὲν λευκὸς τὸ φύλλον

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[1] *i.e.* there is a gradation.
[2] *κίσθος* conj. Sch.; *κισσὸς* Ald.H.
[3] *σπειραία* conj. Sch. from Plin. 21. 53; *σμηρέα* Ald.G.
[4] *θύμβρα σφάκος* conj. Sch.; *θύμβρας φακὸς* UMVAld.
[5] *cf.* 6. 2. 5.
[6] *ναρθηκώδη* = hollow-stemmed, *ἐννευρόκαυλα* = plants with a plain unjointed stem, solid with 'immersed' fibres. In the

With spineless plants it is not possible to make such 'generic' distinctions; for the variation of the leaves in size and shape is endless, and the differences are not clearly marked[1]; but we must try to distinguish on another principle. There are many classes of such plants and they differ widely, as rock-rose[2] bryony madder privet[3] *kneoron* marjoram savory *sphakos*[4] (sage) *elelisphakos*[5] (salvia) horehound *konyza* balm, and others like these; and in addition to these we have the plants with a ferula-like stem[6] or with a stem composed of fibre, as fennel horse-fennel[7] *narthekia* (ferula) *narthex* (ferula) and the plant called by some wolf's bane,[8] and others like these. All these, as well as any other ferula-like plants, may be placed in the class of under-shrubs.

Of spineless under-shrubs and their differences.

II. The various forms and the differences between the above mentioned plants are in some cases more, in some less easy to distinguish. Of rock-rose[9] they distinguish two kinds, 'male' and 'female,' in that the one is[10] larger, tougher, more glossy,[11] and has a crimson flower; both however are like the wild rose,[12] save that the flower is smaller and scentless.

There are also two kinds of *kneoron*, one white, the other black. The white has a leathery oblong

examples given here the two classes are taken together, *ναρθηκία* being *ναρθηκώδης*, the others *ἐννευρόκαυλα*; hence the article is not repeated. [7] *cf.* 6. 2. 7.

[8] Lit. 'mouse-bane': for other Greek names see Index.

[9] *κίσθου* conj. Sch., *cf.* 6 1. 4; *κισσοῦ* Ald. H.; Plin. 24. 81; Diosc. 1. 97.

[10] *εἶναι* conj. W.; *ἔχειν* UMV Ald. (*τὸ φύλλον ἔχειν* conj. Sch.).

[11] *i.e.* has more glossy leaves.

[12] *cf.* Plin. 21. 55; Theocr. 5. 131. See Index.

δερματῶδες πρόμηκες ὁμοιόσχημον τρόπον τινὰ τῇ ἐλάᾳ, ὁ δὲ μέλας οἷον ἡ μυρίκη σαρκῶδες· ἐπίγειος δὲ μᾶλλον ὁ λευκός· ἔστι δὲ ὀσμώδης, ὁ δὲ μέλας ἄοσμος. τὴν δὲ ῥίζαν τὴν εἰς βάθος ἄμφω μεγάλην ἔχουσι καὶ τοὺς ἀκρεμόνας πολλοὺς καὶ παχεῖς καὶ ξυλώδεις ἀπ' αὐτῆς τῆς γῆς ἢ μικρὸν ἄνω σχιζομένους, ξυλωδεστάτην δέ. γλίσχρον δὲ σφόδρα, δι' ὃ καὶ χρῶνται πρὸς τὸ καταδεῖν καὶ περιλαμβάνειν, ὥσπερ τῷ οἴσῳ. βλαστάνει δὲ καὶ ἀνθεῖ μετ' ἰσημερίαν μετοπωρινὴν καὶ ἀνθεῖ πολὺν χρόνον.

3 Καὶ τῆς ὀριγάνου δὲ ἡ μέλαινα ἄκαρπος ἡ δὲ λευκὴ κάρπιμος. καὶ θύμον τὸ μὲν λευκὸν τὸ δὲ μέλαν εὐανθὲς δὲ σφόδρα· περὶ τροπὰς γὰρ ἀνθεῖ θερινάς. ἀφ' οὗ καὶ ἡ μέλιττα λαμβάνει τὸ μέλι, καὶ τούτῳ φασὶν οἱ μελιττουργοὶ δῆλον εἶναι πότερον εὐμελιτοῦσι ἢ οὔ· καλῶς γὰρ ἀπανθήσαντος εὐμελιτεῖν· βλάπτει δὲ καὶ ἀπόλλυσι τὴν ἄνθησιν ἐὰν ὕδωρ ἐπιγένηται.

Σπέρμα δὲ κάρπιμον ἡ μὲν θύμβρα καὶ ἔτι μᾶλλον ἡ ὀρίγανος ἔχει φανερόν, τοῦ θύμου δ' οὐκ ἔστι λαβεῖν, ἀλλ' ἐν τῷ ἄνθει πως ἀναμέμικται· σπείρουσι γὰρ τοῦτο καὶ ἀναβλαστάνει.

4 ζητοῦσι δὲ καὶ λαμβάνουσιν οἱ ἐξάγειν Ἀθήνῃσι βουλόμενοι τὸ γένος. ἴδιον δὲ ἔχει καὶ πρὸς ταῦτα καὶ σχεδὸν πρὸς τὰ ἄλλα τὸ κατὰ τοὺς τόπους· οὐ γάρ φασι δύνασθαι φύεσθαι καὶ

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[1] *cf.* 1. 10. 4.

[2] Apparently an afterthought, suggested by the mention of the woodiness of the branches.

[3] περιλαμβάνει conj. W. from G ; περιλαμβάνειν Ald.

[4] Plin. 21. 55.

leaf, somewhat like that of the olive; the leaf of the black is like that of the tamarisk[1] and fleshy; the white grows more on the ground and is scented, while the black is scentless. In both the root, which runs deep, is large (and the branches which divide at the ground level are numerous thick and woody), and the root is also very woody.[2] It is also very tough, wherefore it is used for binding and to put[3] round things, like the withy. It grows and flowers after the autumnal equinox, and remains in flower a long time.

[4] Of marjoram the black form is barren, the white bears fruit. [5] There is a black and a white thyme, and it flowers very freely: it is in bloom about the summer solstice. It is from this flower that the bee gets the honey, and by it[6] beekeepers say that it is made known whether they have a good yield of honey or not; for, if the thyme flowers abundantly,[7] they have a good yield, but the bloom is injured or even destroyed if it is rained upon.

Savory, and still more marjoram, has a conspicuous fruitful seed, but in thyme it is not easy to find, being somehow mixed up with the flower; for men sow the flower and plants come up from it. [8] This plant is sought and obtained by those in Athens who wish to export such herbs. But it has a peculiarity as compared both with similar plants and with most others, namely the kind of region which it affects[9]; they say that it can not be grown or become

[5] Plin. 21. 56 and 154.

[6] *τούτῳ* conj. Sch.; *τοῦτο* Ald.

[7] *καλῶς* mBod.; *ἄλλως* UMVAld H.

[8] Plin. 21. 57.

[9] *τὸ κατὰ τοὺς τόπους* conj. W.; *καὶ κατὰ τοὺς τ.* Ald.; *καὶ κατὰ τόπους* P.

λαμβάνειν ὅπου μὴ ἀναπνοὴ διϊκνεῖται ἡ ἀπὸ τῆς θαλάττης· δι' ὃ οὐδ' ἐν Ἀρκαδίᾳ γίνεται· θύμβρα δὲ καὶ ὀρίγανος καὶ τὰ τοιαῦτα πολλὰ καὶ πολλαχοῦ. παραπλήσιον οὖν τὸ συμβαῖνον τοῦτο καὶ ἐπὶ τῆς ἐλάας· οὐδὲ γὰρ οὐδ' ἐκείνη δοκεῖ τριακοσίων σταδίων ἀπὸ θαλάττης ἐπάνω φύεσθαι.

5 Σφάκος δὲ καὶ ἐλελίσφακος διαφέρουσιν ὡσὰν τὸ μὲν ἥμερον τὸ δὲ ἄγριον· λειότερον γὰρ τὸ φύλλον τοῦ σφάκου καὶ ἔλαττον καὶ αὐχμηρότερον, τὸ δὲ τοῦ ἐλελισφάκου τραχύτερον.

Δύο δὲ γένη καὶ τοῦ πρασίου· τὸ μὲν γὰρ ἔχει ποῶδες τὸ φύλλον καὶ μᾶλλον ἐπικεχαραγμένον, ἔτι δὲ τὰς ἐντομὰς ἐνδήλους σφόδρα καὶ βαθείας, ᾧ καὶ οἱ φαρμακοπῶλαι χρῶνται πρὸς ἔνια· τὸ δὲ ἕτερον στρογγυλότερον καὶ αὐχμῶδες σφόδρα, καθάπερ τοῦ σφάκου, καὶ τὰς ἐντομὰς ἀμαυροτέρας ἔχον καὶ ἐπικεχαραγμένον ἧττον.

6 Κονύζης δὲ τὸ μὲν ἄρρεν τὸ δὲ θῆλυ. διαφορὰς δὲ ἔχει καθάπερ τὰ ἄλλα τὰ οὕτω διαιρούμενα· τὸ μὲν γὰρ θῆλυ λεπτοφυλλότερον καὶ ξυνεστηκὸς μᾶλλον καὶ τὸ ὅλον ἔλαττον, τὸ δὲ ἄρρεν μεῖζόν τε καὶ παχυκαυλότερον καὶ πολυκλωνότερον καὶ τὸ φύλλον μεῖζον καὶ λιπαρώτερον ἔχον, ἔτι δὲ τὸ ἄνθος λαμπρότερον. καρποφόρα δὲ ἄμφω· τὸ δὲ ὅλον ὀψιβλαστεῖ καὶ ὀψιανθεῖ περὶ Ἀρκτοῦρον καὶ μετ'

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[1] λαμβάνειν P_2Ald.: lit. 'take hold,' *cf.* 6. 2. 6; βλαστάνειν conj. W.

[2] σφάκος conj. Sch.: σφάκελος UMVP_2Ald.; Plin. 22, 146 and 147.

established[1] where a breeze from the sea does not reach. This is why it does not grow in Arcadia, while savory marjoram and such plants are common in many parts. (A similar peculiarity is found in the olive; for it appears that it likewise will not grow more than three hundred furlongs from the sea.)

The difference between *sphakos*[2] (sage) and *elelisphakos* (salvia) is like that between cultivated and wild; for the leaf of *sphakos*[3] is smoother smaller and less succulent,[4] while that of *elelisphakos* is rougher.[5]

There are also two kinds of horehound: one has a narrow leaf with a more jagged edge, and the notches are very conspicuous and deep, and this is the plant used by druggists for certain purposes; the other has a rounder[6] leaf, which, like that of *sphakos*, is not at all succulent; the notches are less conspicuous and the edge less jagged.

Of *konyza*[7] there is a 'male' and a 'female' kind, the differences between them being such as are usual between forms so distinguished; the 'female' has slenderer leaves, is more compact, and a smaller plant; the 'male' is larger, has thicker stalks, is more branched, has larger glossier leaves, and moreover the flower is more conspicuous. Both bear fruit; the plant as a whole is late in growing and in blooming; it blooms about the rising of

[3] *σφάκου* conj. Sch.; *σφακέλου* UMVP$_2$Ald.
[4] W. omits *ἧττον* before *αὐχμηρότερον*.
[5] *τραχύτερον* conj. Scal. from G; *βραχύτερον* Ald.H.
[6] *στρογγυλότερον*: *cf.* l. 10. 4 n.
[7] See Index. Plin. 26. 58. *cf.* Nic. *Ther.* 875; Diosc. 3. 121.

Ἀρκτοῦρον λαμβάνει. βαρεῖα δὲ ἡ ὀσμὴ τοῦ ἄρρενος, ἡ δὲ τῆς θηλείας δριμυτέρα, δι' ὃ καὶ πρὸς τὰ θηρία χρησίμη.

Ταῦτα μὲν οὖν καὶ τὰ τοιαῦτα ὥσπερ διαφέροντα. πάλιν δὲ ἄλλα μονοειδῆ τυγχάνοντα καὶ τῶν πρότερον εἰρημένων καὶ ἕτερα παρὰ ταῦτα· πλείω γάρ ἐστι.

7 Τὸ δὲ ναρθηκῶδες, καὶ γὰρ καὶ τοῦτο τῶν φρυγανικῶν, πολλὰς περιείληφεν ἰδέας· ἐν οἷς πρῶτον ὑπὲρ τοῦ κοινοῦ πᾶσι λεκτέον, ὑπὲρ νάρθηκός τε καὶ ναρθηκίας, εἴτε τὸ αὐτὸ γένος ἐστὶν ἀμφοῖν διαφέρον δὲ κατὰ μέγεθος, εἴτε καὶ ἕτερον ὥσπερ τινές φασιν. ἡ δ' οὖν φανερὰ φύσις ἀμφοῖν ὁμοία πλὴν κατὰ τὸ μέγεθος· ὁ μὲν γὰρ νάρθηξ γίνεται μέγας σφόδρα ἡ δὲ ναρθηκία μικρά. μονόκαυλα δ' ἄμφω καὶ γονατώδη, ἀφ' ὧν τά τε φύλλα βλαστάνει καὶ καυλοί
8 τινες μικροί· βλαστάνει δὲ παραλλὰξ τὰ φύλλα· λέγω δὲ παραλλὰξ ὅτι οὐκ ἐκ τοῦ αὐτοῦ μέρους τῶν γονάτων ἀλλ' ἐναλλάξ· περιειληφότα δὲ τὸν καυλὸν ἐπὶ πολύ, καθάπερ τὰ τοῦ καλάμου, πλὴν ἀποκεκλιμένα ταῦτα μᾶλλον διὰ τὴν μαλακότητα καὶ τὸ μέγεθος· μέγα γὰρ τὸ φύλλον καὶ μαλακὸν καὶ πολυσχιδές, ὥστε εἶναι σχεδὸν τριχῶδες· ἔχει δὲ μέγιστα τὰ κάτω πρὸς τὴν γῆν καὶ ἀεὶ κατὰ λόγον. ἄνθος δὲ μηλινοειδὲς ἀμαυρόν, καρπὸν δὲ παρόμοιον τῷ ἀνήθῳ πλὴν

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[1] λαμβάνει Ald.; ἀδρύνει conj. W. But *cf.* the somewhat similar use 6. 2. 4.

[2] *contra bestiarum morsus* Plin. *l.c.*

[3] Plin. 13. 132 and 133.

[4] The form of expression in the repeated ὑπὲρ seems loose,

Arcturus and is full grown[1] after his setting. The smell of the 'male' plant is strong, but that of the 'female' more pungent; wherefore both of them are of use against wild beasts.[2]

These plants then and others like them have, as it were, different forms. Again there are some which have but one form both among those already mentioned and others as well; for there are numerous plants of this class.

[3] The class of ferula-like plants (for this too belongs to the under-shrubs) comprises many kinds: here we must first speak of the characteristic which is common to all, including ferula itself[4] (*narthex*) and *narthekia*, whether they both belong to the same kind and differ only in size, or whether, as some say, they are distinct. The obvious character of both is alike, except as to size; for *narthex* grows very tall, while *narthekia* is a small plant. Each of them has a single stalk, which is jointed; from this spring the leaves and some small stalks; the leaves come alternately—by which I mean that they do not spring from the same part of the joint, but in alternating rows. For a considerable distance they embrace the stalk, like the leaves of the reed, but they turn back from it more owing to their softness and their size; for the leaf is large soft and much divided, so that it is almost hair-like; the largest leaves are the lowest ones next the ground, and so on in proportion. The flower is quince-yellow[5] and inconspicuous, the fruit[6] like dill, but larger.[7] The

and above *ἐν οἷς* is hardly satisfactory. Sch. suspects corruption.

[5] *μηλινοειδὲς*: *cf.* 7. 3. 1.

[6] *ἀμαυρόν, καρπὸν δὲ* conj. Sch.; *ἀμαυρόκαρπον* Ald.

[7] *μείζω* conj. Sch.; *μεῖζον* Ald.

μείζω. ἐξ ἄκρου δὲ σχίζεται καὶ ἔχει τινὰς οὐ μεγάλους καυλούς· ἐνταῦθα δὲ τό τε ἄνθος καὶ ὁ καρπός. ἔχει δὲ καὶ ἄνθος καὶ καρπὸν καὶ ἐν τοῖς παρακαυλίζουσι δι' ὅλου, καθάπερ τὸ ἄνηθον. ἐπετειόκαυλον δέ, καὶ ἡ βλάστησις τοῦ ἤρος πρῶτον μὲν τῶν φύλλων ἔπειτα τοῦ καυλοῦ, καθάπερ τῶν ἄλλων. ῥίζαν δὲ ἔχει βαθεῖαν, ἔστι δὲ μονόρριζον. ὁ μὲν οὖν νάρθηξ τοιοῦτος.

9 Τῶν δ' ἄλλων τὰ μὲν ὁμοιότερα τούτῳ τὸν καυλὸν ἔχει <κοῖλον>, καθάπερ ὁ μανδραγόρας καὶ τὸ κώνειον καὶ ὁ ἑλλέβορος καὶ ὁ ἀνθέρικος· τὰ δ' οἷον ἐννευρόκαυλα τυγχάνει, καθάπερ μάραθον μυοφόνον τὰ ὅμοια τούτοις. ἴδιος δὲ ὁ καρπὸς τοῦ μανδραγόρου τῷ μέλας τε καὶ ῥαγώδης καὶ οἰνώδης εἶναι τῷ χυμῷ.

III. Μέγισται δὲ καὶ ἰδιώταται φύσεις ἥ τε τοῦ σιλφίου καὶ ἡ τοῦ παπύρου ἐν Αἰγύπτῳ· ναρθηκώδη γὰρ καὶ ταῦτά ἐστιν· ὑπὲρ ὧν τοῦ μὲν παπύρου πρότερον εἴπομεν ἐν τοῖς ἐνύδροις, ὑπὲρ θατέρου δὲ νῦν λεκτέον.

Τὸ δὲ σίλφιον ἔχει ῥίζαν μὲν πολλὴν καὶ παχεῖαν, τὸν δὲ καυλὸν ἡλίκον νάρθηξ, σχεδὸν δὲ καὶ τῷ πάχει παραπλήσιον, τὸ δὲ φύλλον, ὃ καλοῦσι μάσπετον, ὅμοιον τῷ σελίνῳ· σπέρμα

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[1] κοῖλον add. W.

[2] See Index: the *stalk* is specially in question here.

[3] *cf.* 6. 1. 4 n. ἐκνευρόκαυλα P_2Ald., *cf.* ἔκλευκος, 'whitish'; ἐννευρόκαυλα conj. Sch. as in 6. 1. 4; but οἷον indicates the coinage of a fresh term. κώνειον seems to be placed in the wrong list.

[4] Plin. 25. 147–150 describes *mandragoras*, but his description is not taken from T. *cf.* Diosc. 4. 75, where three kinds

plant divides at the top and has some small branches, on which grow the flower and the fruit. It also bears flowers and fruit on the side-stalks all the way up, like dill. The stalk only lasts a year, and the growth takes place in spring, the leaves growing first and then the stem, as with other plants. It roots deep and has but a single root. Such is the ferula.

Of the others some to a certain extent resemble ferula, that is, in having a hollow stem [1]; for instance deadly nightshade hemlock hellebore asphodel [2]: while some have a stem more or less, as it were, consisting of fibre,[3] as fennel aconite and others like these. The fruit of deadly nightshade [4] is peculiar in being black and like a grape and like wine in taste.

Of certain specially important spineless under-shrubs—silphium and magydaris—*belonging to ferula-like plants.*

III. Most important and peculiar in their characters are the silphium and papyrus of Egypt. These too come under the class of ferula-like plants; of these we have spoken [5] of the papyrus already under the head of plants living in water; of the other we have now to speak.

[6] The silphium has a great deal of thick root; its stalk is like ferula in size, and is nearly as thick; the leaf, which they call *maspeton,* is like celery: it has a broad fruit, which is leaf-like,

of *μανδραγόρας* are described: there being only two known species of *mandragora,* the third may be *atropa Belladonna*; and to this plant may also refer an interpolated sentence in Diosc. 4. 73 (*ἄνθος . . . σταφυλήν*).

[5] 4. 8. 3 and 4. Papyrus is loosely classed with ferula-like plants, as it has not a hollow stem. [6] Plin. 19. 42–45.

δ' ἔχει πλατύ, οἷον φυλλῶδες, τὸ λεγόμενον φύλλον. ἐπετειόκαυλον δ' ἐστίν, ὥσπερ ὁ νάρθηξ. ἅμα μὲν οὖν τῷ ἦρι τὸ μάσπετον τοῦτο ἀφίησιν, ὃ καθαίρει τὰ πρόβατα καὶ παχύνει σφόδρα καὶ τὰ κρέα θαυμαστὰ ποιεῖ τῇ ἡδονῇ· μετὰ δὲ ταῦτα καυλόν, <ὃν> ἐσθίεσθαι πάντα τρόπον ἑφθὸν ὀπτόν, καθαίρειν δὲ καὶ τοῦτόν φασι τὰ σώματα
2 τετταράκοντα ἡμέραις. ὀπὸν δὲ διττὸν ἔχει, τὸν μὲν ἀπὸ τοῦ καυλοῦ τὸν δὲ ἀπὸ τῆς ῥίζης, δι' ὃ καλοῦσι τὸν μὲν καυλίαν τὸν δὲ ῥιζίαν. ἡ δὲ ῥίζα τὸν φλοιὸν ἔχει μέλανα, καὶ τοῦτον περιαιροῦσιν. ἔστι δὲ ὥσπερ μέταλλα τῶν ῥιζοτομιῶν αὐτοῖς, ἐξ ὧν ὁπόσον ἂν δοκῇ συμφέρειν ταμιευόμενοι πρὸς τὰς τομὰς καὶ τὸ προϋπάρχον τέμνουσιν· οὐκ ἔξεστι γὰρ οὔτε παρατέμνειν οὔτε πλεῖον τῶν τεταγμένων· καὶ γὰρ διαφθείρεται καὶ σήπεται τὸ ἀργὸν ἐὰν χρονίζῃ. κατεργάζονται δὲ ἄγοντες εἰς τὸν Πειραιᾶ τόνδε τὸν τρόπον· ὅταν βάλωσι εἰς ἀγγεῖα καὶ ἄλευρα μίξωσι, σείουσι χρόνον συχνόν, ὅθεν καὶ τὸ χρῶμα λαμβάνει καὶ ἐργασθὲν ἄσηπτον ἤδη διαμένει. τὰ μὲν οὖν κατὰ τὴν ἐργασίαν καὶ τομὴν οὕτως ἔχει.

3 Τόπον δὲ πολὺν ἐπεχει τῆς Λιβύης· πλείω γάρ φασιν ἢ τετρακισχίλια στάδια· πλεῖστα δὲ γίνεσθαι περὶ τὴν σύρτιν ἀπὸ τῶν Εὐεσπερίδων. ἴδιον δὲ τὸ φεύγειν τὴν ἐργαζομένην καὶ ἀεὶ συνεργαζομένης καὶ συνημερουμένης ἐξαναχωρεῖν,

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[1] οἷον φυλλ. τὸ λεγ. conj. W.; φυλλ. οἷον τὸ λεγ. Ald.H.
[2] I have added ὃν.
[3] μέταλλα U; μέτρα Ald.; ? ἐν μετάλλοις μέτρα.
[4] *cf.* 9. 1. 7; Diosc. 3. 80.

as it were,[1] and is called the *phyllon*. The stalk lasts only a year, like that of ferula. Now in spring it sends up this *maspeton*, which purges sheep and greatly fattens them, and makes their flesh wonderfully delicious; after that it sends up a stalk, which[2] is eaten, it is said, in all ways, boiled and roast, and this too, they say, purges the body in forty days. It has two kinds of juice, one from the stalk and one from the root; wherefore the one is called 'stalk-juice,' the other 'root-juice.' The root has a black bark, which is stripped off. They have regulations, like those in use in mines,[3] for cutting the root, in accordance with which they fix carefully the proper amount to be cut, having regard to previous cuttings and the supply of the plant. For it is not allowed to cut it wrong nor to cut more than the appointed amount; for, if the juice is kept and not used, it goes bad and decays. When they are conveying it to Peiraeus, they deal with it thus[4]:—having put it in vessels and mixed meal with it, they shake it for a considerable time, and from this process it gets its colour, and this treatment[5] makes it thenceforward keep without decaying. Such are the facts in regard to the cutting and treatment.

The plant is found over a wide tract of Libya, for a distance,[6] they say, of more than four thousand furlongs, but it is most abundant[7] near the Syrtis, starting from the Euesperides islands. It is a peculiarity of it that it avoids cultivated ground, and, as the land is brought under cultivation and tamed,

[5] ἐργασθὲν: ἐξοργασθὲν conj. Salm.; from Plin. *l.c.*, *argumentum erat maturitatis color siccitasque sudore finito.*

[6] *cf.* Strabo 2. 5. 20; 17. 3. 20: Scyl. *Periplus*, Libya.

[7] πλεῖστα conj. W.; πλείονα U; τὰ πλείονα MAld.; γίνεσθαι conj. W.; γενέσθαι Ald.

ὡς οὐ δεομένου δῆλον ὅτι θεραπείας ἀλλ' ὄντος ἀγρίου. φασὶ δ' οἱ Κυρηναῖοι φανῆναι τὸ σίλφιον ἔτεσι πρότερον ἢ αὐτοὶ τὴν πόλιν ᾠκησαν ἑπτά· οἰκοῦσι δὲ μάλιστα περὶ τριακόσια εἰς Σιμωνίδην ἄρχοντα Ἀθήνῃσιν.

4 Οἱ μὲν οὖν οὕτω λέγουσιν. οἱ δὲ τοῦ σιλφίου τὴν ῥίζαν φασὶ γίνεσθαι πηχυαίαν ἢ μικρῷ μείζω. ταύτην δὲ ἔχειν ἐπὶ τοῦ μέσου κεφαλήν, ὃ καὶ μετεωρότατόν ἐστι καὶ σχεδὸν ὑπὲρ γῆς, καλεῖσθαι δὲ γάλα· ἐξ ἧς δὴ φύεσθαι μετὰ ταῦτα καὶ τὸν καυλόν, ἐκ δὲ τούτου μαγύδαριν τὸ καὶ καλούμενον φύλλον· τοῦτο δ' εἶναι σπέρμα· καὶ ὅταν νότος λαμπρὸς πνεύσῃ μετὰ Κύνα διαρρίπτεσθαι, ἐξ οὗ φύεσθαι τὸ σίλφιον. τῷ αὐτῷ δὲ ἔτει τήν τε ῥίζαν γίνεσθαι καὶ τὸν καυλόν· οὐθὲν δὲ τοῦτο ἴδιον, καὶ γὰρ ἐπ' ἄλλων, εἰ μὴ τοῦτο λέγουσιν ὅτι εὐθὺς φύεται μετὰ τὴν διάρριψιν.

5 Καὶ τοῦτο ἴδιον καὶ διάφορον τοῖς πρότερον, ὅτι φασὶ δεῖν ὀρύττειν ἐπέτειον· ἐὰν δὲ ἐαθῇ, φέρειν μὲν τὸ σπέρμα καὶ τὸν καυλόν, χείρω δὲ γίνεσθαι καὶ ταῦτα καὶ τὴν ῥίζαν, ὀρυττομένας δὲ βελτίους γίνεσθαι διὰ τὸ μεταβάλλεσθαι τὴν γῆν. ἐναντίον δὲ τοῦτο τῷ φεύγειν τὴν ἐργάσιμον. ἐσθίεσθαι καὶ τὰς ῥίζας προσφάτους κατατεμνομένας εἰς ὄξος. τὸ δὲ φύλλον τῇ χροιᾷ χρυσοειδὲς

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[1] *cf.* Hdt. 4. 158. [2] B.C. 310.

[3] *ταύτην δὲ . . . τὸ σίλφιον*: text as restored conjecturally by W., chiefly by alteration in the order of the words in Ald.

[4] *καλεῖσθαι δὲ γάλα* after *φύεσθαι* in Ald.

[5] In 6. 3. 7 this name is applied to a distinct plant. *μαγ. τὸ καὶ* conj. Salm.; *μαγ. καὶ τὸ* P_2Ald.H. [6] *cf.* 6. 3. 2.

[7] *τοῦτο* conj. Salm.; *τούτου* UMVAld.; *τοῦτον* P_2.

it retires, plainly shewing that it needs no tendance but is a wild thing. The people of Cyrene say that the silphium appeared[1] seven years before they founded their city; now they had lived there for about three hundred years before the archonship at Athens of Simonides.[2]

Such is their account. Others however say that the root of the silphium grows to the length of a cubit or a little longer, and in the middle of this is a head,[3] which is the highest part and almost comes above ground, and is called the 'milk',[4] from this then presently grows the stalk, and from that the *magydaris*,[5] which is also called the *phyllon*[6]; but it[7] is really the seed, and, when a strong south wind blows after the setting of the dog-star, it is scattered[8] abroad and the silphium grows from it. The root and the stalk grow in the same year; nor is this a singular feature—unless they mean that it grows immediately after the dispersal[9] of the seed—since the same thing occurs with other[10] plants also.

There is this singular statement, which is inconsistent with what was said above, that, it is said, it is necessary to dig the ground every year, and that, if it be left alone, it bears[11] the seed and the stalk, but these are inferior and so is the root; on the other hand, that with digging they are improved because the soil is changed. (This is inconsistent with the statement that silphium avoids cultivated land.) They add that the roots are cut up into vinegar and eaten fresh, and that the leaf is of a golden

[8] διαρρίπτεσθαι conj. Sch.; διαρρίπτεται Ald.; διαρριπτείται U; διαρρίπτηται M.

[9] διάρριψιν conj. Sch.; δίριψιν UM; ἔκριψιν Ald.

[10] ἐπ' ἄλλων conj. W.; τῶν ἄλλων Ald. H.

[11] μὲν conj. Sch.; πᾶν Ald.

6 εἶναι. ἐναντίον δὲ καὶ τὸ μὴ καθαίρεσθαι τὰ πρόβατα τὸ φύλλον ἐσθίοντα· φασὶ γὰρ καὶ τοῦ ἤρος καὶ τοῦ χειμῶνος εἰς ὄρος ἀφιέναι, νέμεσθαι δὲ τοῦτό τε καὶ ἕτερον ὅμοιον ἀβροτόνῳ· θερμαντικὰ δ' ἄμφω δοκεῖ εἶναι καὶ κάθαρσιν μὲν οὐ ποιεῖν, ἀναξηραίνειν δὲ καὶ συμπέττειν· ἐὰν δέ τι νοσοῦν ᾖ κακῶς ἔχον εἰσέλθῃ πρόβατον, ὑγιάζεσθαι ταχέως ἢ ἀποθνήσκειν, ὡς δ' ἐπὶ τὸ πολὺ σώζεσθαι μᾶλλον. ταῦτα μὲν ὁποτέρως ἔχει σκεπτέον.

7 Ἡ δὲ καλουμένη μαγύδαρις ἕτερόν ἐστι τοῦ σιλφίου μανότερόν τε καὶ ἧττον δριμὺ καὶ τὸν ὀπὸν οὐκ ἔχει· διάδηλος δέ ἐστι καὶ τῇ ὄψει τοῖς ἐμπείροις. γίνεται δὲ περὶ Συρίαν καὶ οὐκ ἐν Κυρήνῃ· φασὶ δὲ καὶ ἐν τῷ Παρνασίῳ ὄρει πολλήν· ἔνιοι δὲ σίλφιον τοῦτο καλοῦσιν. εἰ δὲ φεύγει τὴν ἐργάσιμον ὥσπερ τὸ σίλφιον σκεπτέον, ὡσαύτως δὲ καὶ εἴ τι ὅμοιον ἢ παραπλήσιον ἔχει φύλλου τε πέρι καὶ καυλοῦ, καὶ εἰ ὅλως ἀφίησί τι δάκρυον. τὴν μὲν οὖν ναρθηκώδη [καὶ ὅλως τὴν ἀκανθώδη] φύσιν ἐν τοῖς τοιούτοις θεωρητέον.

IV Τῆς δ' ἀκανθικῆς, ἑπόμενον γὰρ τοῦτο εἰπεῖν, ἐπειδὴ διῄρηται τὸ μὲν ἀκανθῶδες ὅλως τὸ δὲ φυλλάκανθον, ὑπὲρ ἑκατέρου χώρις λεκτέον,

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[1] *cf.* Arr. *Anab.* 3. 28. 6 and 7.

[2] *Artemisia camphorata* : Index App. (24).

[3] Plin. 19. 46; Diosc. 3. 94; Hesych. *s.v.*; Photius, *Gloss. s.v.*; *cf.* 6. 3. 4 n.

colour. We have also the inconsistent statement that sheep are not purged by eating the leaves; for they say that in spring and in winter they are driven into the hill-country, where[1] they feed on this and on another plant[2] which is like southernwood; both these plants appear to be heating and not to cause purging, but, on the contrary, to have a drying effect and promote digestion. It is also said that, if a sheep which is sick or in bad condition comes to that district, it is quickly cured or else dies, but usually it recovers. Which of these accounts is true is matter for enquiry.

[3]The plant called *magydaris* is distinct from silphium, being of later growth and less pungent, and it does not produce the characteristic juice; experts can also easily distinguish it by its appearance. It grows in Syria and not in Cyrene, and they say that it is also abundant on Mount Parnassus, and some call it silphium. Whether however, like silphium, it avoids cultivated ground is matter for enquiry, as also whether it has any resemblance or likeness in leaf and stalk, and, in general, whether it produces a juice. In these examples we may consider the class of ferula-like plants [and, in general, that of spinous plants.[4]]

Of spinous under-shrubs and their differences.

IV. Taking next the class of spinous plants (for we must next speak of them), we have already distinguished[5] those which are altogether spinous and those which have spinous leaves, and now we must

[4] *καὶ . . . ἀκανθώδη.* These words occur only in U: they cannot belong here. Note that *τὸ μὲν ἀκανθῶδες ὅλως* occurs just below. [5] 6. 1. 3.

καὶ τρίτου δὴ περὶ τοῦ καὶ παρὰ τὴν ἄκανθαν ἔχοντος φύλλον, ὥσπερ ὅ τε φέως καὶ ὁ τρίβολος. καὶ ἡ κάππαρις ἴδιον ἔχει τὸ μὴ μόνον τὴν ἐκ τῶν καυλῶν ἄκανθαν ἔχειν ἀλλὰ καὶ τὸ φύλλον ἐπακανθίζον. τῶν δὲ διῃρημένων εἰδῶν πλεῖστον μέν ἐστι τὸ φυλλάκανθον, ἐλάχιστον δὲ ὡς εἰπεῖν τὸ ἀκανθῶδες ὅλως. βραχὺ γάρ τι πάμπαν ἐστίν, ὥσπερ ἐλέχθη, καὶ σχεδὸν οὐ ῥᾴδιον λαβεῖν παρά τε τὸν ἀσφάραγον καὶ τὸν σκορπίον.

2 Ἀμφότερα δὲ ταῦτα ἀνθεῖ μετὰ ἰσημερίαν φθινοπωρινήν. ὁ μὲν σκορπίος ἐν τῷ σαρκώδει τῷ ἐποιδοῦντι τῷ ὑπὸ τὸ ἄκρον τῆς ἀκάνθης ἔχων τὸ ἄνθος ἐξ ἀρχῆς μὲν λευκὸν ὕστερον δ' ἐπιπορφυρίζον. ὁ δὲ ἀσφάραγος ἐκφύων παρὰ τὰς ἀκάνθας κορυνῶδες μικρόν, ἐκ τούτου δέ ἐστι τὸ ἄνθος μικρόν. ὁ δὲ σκορπίος μονόρριζον καὶ βαθύρριζον, ὁ δὲ ἀσφάραγος βαθύρριζόν τε εὖ μάλα καὶ πολύρριζον πυκναῖς ταῖς ῥίζαις, ὥστε τὸ ἄνω συνεχὲς εἶναι αὐτῶν, ἀφ' οὗ καὶ αἱ βλαστήσεις αὐτῶν τῶν καυλῶν· ἀναβλαστάνει δὲ ὁ καυλὸς ἐκ τῆς ἀσφαραγιᾶς τοῦ ἦρος καὶ ἐδώδιμός ἐστιν· εἶθ' οὕτως ἀποτραχύνεται καὶ ἐξακανθοῦται προϊούσης τῆς ὥρας· ἡ δὲ ἄνθησις οὐκ ἐκ τούτου μόνον ἀλλὰ καὶ ἐκ τῶν πρότερον· οὐ γὰρ ἐπετειόκαυλόν ἐστι. τὰ μὲν οὖν ὅλως ἀκανθώδη τοιαύτην τινὰ ἔχει φύσιν.

3 Τῶν δὲ φυλλακάνθων τὸ πλεῖστον γένος ὡς

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[1] *φέως* conj. St.; *φλεὼς* Ald. *cf.* 6. 1. 3.
[2] *cf.* 6 1. 3. [3] Plin. 21. 91; 22. 39.

speak of each of these classes separately, and also, in the third place, of those which have leaves as well as their spines, such as *pheos*[1] and caltrop. Moreover caper has the peculiarity of possessing not only spines on its stems but also a spinous leaf. Of the classes thus distinguished that with spinous leaves is the largest, while that which is altogether spinous is about the smallest. It is indeed, as was said, a very small class, and it would not be easy to find examples of such plants besides asparagus and *skorpios*.[2]

[3] Both of these flower after the autumnal equinox. *Skorpios* produces its flower in the fleshy swelling[4] below the top[5] of the spinous twig; at first it is white, but afterwards it becomes purplish. Asparagus produces alongside of the spines a small knob, and from this grows the flower, which is of small size. *Skorpios* has a single root which runs deep; asparagus roots very deep and its roots are numerous and matted, the upper part of them being in one piece,[6] and from this the actual shoots spring. The stalk comes up from the plant in spring and is edible; afterwards, as the season advances, it acquires its rough and spinous character[7]; the bloom appears not only on this stalk, but on those of previous years, for the stalk is not annual. Such is the character of plants which are altogether spinous.

[8] Of those which have spinous leaves the largest class, one may say, consists of those plants which

[4] *ἐποιδοῦντι* conj. Scal.; *ἐπωδοῦντι* U; *ἐσποδοῦντι* MAld.

[5] *τὸ ἄκρον* conj. Scal.; *τὸ ἄκρατον* UMAld.; *τῆς ἀκάνθης* om. Scal.

[6] *i.e.* tuberous. *cf.* Col. 11. 3. 43; Pall. 3. 24. 8; 4. 9. 11.

[7] *ἐξακανθοῦται* conj. Link. *ap.* Sch.; *ἐξανθοῦται* UM; *ἐξανθεῖται* Ald. [8] Plin. 21. 94.

ἁπλῶς εἰπεῖν ἀκανῶδες τυγχάνει· λέγω δὲ τὸ ἀκανῶδες, ὅτι τὸ κύημα καὶ ἐν ᾧ τὸ ἄνθος ἢ καὶ ὁ καρπὸς ἄκανος ἢ ἀκανῶδες πάντων ἐστί. διαφορὰν δὲ ἔχει ἐν ἑαυτῷ καὶ μεγέθει καὶ σχήματι καὶ χρώματι καὶ πλήθει καὶ ὀλιγότητι τῶν ἀκανθῶν καὶ τῶν ἄλλων. ἔξω γὰρ ὀλίγων πάνυ, καθάπερ τοῦ στρουθίου τε καὶ τοῦ σόγκου καὶ εἴ τινων ἑτέρων, τὰ λοιπὰ πάντα ὡς εἰπεῖν τοιαύτην ἔχει τὴν φύσιν· ἐπεὶ καὶ ὁ σόγκος τήν γε φύσιν ἀκανθώδη ἔχει, τὸ δὲ σπερματικὸν οὐχ ὅμοιον· ἀλλὰ τά γε τοιαῦτα πάντα οἷον ἄκορνα λευκάκανθα χάλκειος κνῆκος πολυάκανθος ἀτρακτυλὶς ὀνόπυξος ἰξίνη χαμαιλέων· πλὴν οὗτος οὐ φυλλάκανθος, σκόλυμος δέ, ὃς καὶ λειμωνία, φυλλ-
4 άκανθος· καὶ τἆλλα, πλείω γάρ ἐστι. διαφέρουσι δ' ἀλλήλων πρὸς τοῖς εἰρημένοις τῷ τὰ μὲν πολύκαυλα εἶναι καὶ ἀποφύσεις ἔχειν, ὥσπερ ὁ ἄκανος, τὰ δὲ μονόκαυλα καὶ μὴ ἔχειν, ὥσπερ ὁ κνῆκος, ἔνια δ' ἄνωθεν ἔχειν ἐξ ἄκρου, καθάπερ τὸ ῥύτρος. καὶ τὰ μὲν εὐθὺς τοῖς πρώτοις ὑετοῖς βλαστάνειν τὰ δ' ὕστερον, ἔνια δὲ καὶ τοῦ θέρους, ὥσπερ καὶ ἡ τετράλιξ ὑπό τινων καλουμένη καὶ ἡ ἰξίνη· καὶ ἐπὶ τῶν ἀνθῶν ὁμοίως· ὀψιανθὴς γὰρ ὁ σκόλυμος καὶ ἐπὶ πολὺν χρόνον.

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[1] ἀκανῶδες mBas.; ἀκανθῶδες Ald. *cf.* 1. 13. 3, where ἀκανῶδες is restored by W.'s certain conj.

[2] ἀκανῶδες conj. Sch.; ἀκανθῶδες Ald.H.; *acanaceum* G.

[3] ἄκανος ἢ ἀκανῶδες Ald.; ἄκανθος ἢ ἀκανθῶδες mBas. *v. supra.*

[4] σόγκος conj. Sch.; κνῆκος Ald. The correction seems necessary in view of 6. 4. 8.

[5] ἄκορνα conj. Sch.; ἄκαρνα Ald. *cf.* Plin. *l.c.*

[6] ὃς καὶ λειμωνία I conj.; ἢ καὶ λειμωνία conj. Scal. from

are thistle-like,[1] by which[2] I mean that the swollen part, that part which contains the flower, or, it may be, the fruit, is in all cases a thistle-head,[3] or has that appearance. However there are differences in the 'head' itself, in size shape colour number of spines and in other respects. For, apart from quite a few plants, such as soap-wort sow-thistle and possibly some others, nearly all the rest have this character (even sow-thistle[4] has a spinous character, but its seed-process is different). The list includes all the following: *akorna*[5] milk-thistle *khalkeios* safflower *polyakanthos* distaff-thistle *onopyxos ixine* chamaeleon (the last-named, however, has not spinous leaves, though golden thistle, which is also called 'meadow-thistle,'[6] has[7]), and so on, for there are many more. These differ from one another not only in the aforesaid ways, but in that some of them have many stalks and side-growths, like the pine-thistle, while some have a single stalk and no side-growths, like the safflower, and some again have out-growths above from the top of the plant, like the globe-thistle.[8] Again some grow directly the first rains come, others at a later time, some again in summer, as the plant which some call yellow star-thistle, and *ixine*.[9] So too[10] the flowering-time differs: golden thistle blooms late[11] and is in bloom for a long time.

Plin. 22. 86; ἡλυλειμωνία UM_1; ἡλυλειμωνία M_2Ald. καὶ λειμωνία conj. W. But λειμωνία is not mentioned again in the following description, which is against its being a distinct plant from σκόλυμος.

[7] φυλλάκανθος I conj.; φυλλάκανθα MSS.

[8] ῥύτρος: *rhutrum* G; but Plin. *l.c.* has *eryngen*.

[9] Plin. 22. 23. [10] καὶ ἐπὶ conj. Sch.; καὶ ἡ ἐπὶ Ald.H.

[11] ὀψιανθὴς conj. Bod. from Plin. *l.c. floret sero et diu*; εὐανθὴς Ald.

5 Διαφοραὶ δὲ τῶν μὲν ἀκάνων οὐκ εἰσί, τῆς κνήκου δ' εἰσίν· ἡ μὲν γὰρ ἀγρία ἡ δ' ἥμερος. τῆς δ' ἀγρίας δύο εἴδη, τὸ μὲν προσεμφερὲς σφόδρα τῷ ἡμέρῳ πλὴν εὐθυκαυλότερον, δι' ὃ καὶ πηνίοις ἔνιαι τῶν ἀρχαίων ἐχρῶντο γυναικῶν. καρπὸν δὲ ἔχει μέλανα καὶ μέγαν καὶ πικρόν. ἡ δ' ἑτέρα δασεῖα καὶ τοὺς καυλοὺς ἔχει σογκώδεις, ὥστε τρόπον τινὰ ἐπιγειόκαυλος γίνεται· διὰ γὰρ μαλακότητα τῶν καυλῶν κατακλίνεται πρὸς τὰς ἀρούρας· καρπὸν δ' ἔχει μικρὸν πώγωνος· σπερματώδεις πᾶσαι, πλὴν μειζόσι καὶ πυκνοτέροις αἱ ἄγριαι. ἴδιον δὲ ἔχει πρὸς τὰ ἄλλα ἄγρια· τὰ μὲν γὰρ σκληρότερα καὶ ἀκανθωδέστερα τῶν ἡμέρων, αὕτη δὲ μαλακωτέρα καὶ λειοτέρα.

6 Ἡ δ' ἄκορνα προσεμφερὴς ὡς ἁπλῶς εἰπεῖν κατὰ τὴν πρόσοψιν τῇ κνήκῳ τῇ ἡμέρῳ, χρῶμα δ' ἐπίξανθον ἔχει καὶ χυλὸν λιπαρόν. ἀτρακτυλὶς δέ τις καλεῖται καὶ λευκοτέρα τούτων· ἴδιον δὲ ἔχει τὸ περὶ τὸ φύλλον, ὅτι ἀφαιρούμενον καὶ τῇ σαρκὶ προσφερόμενον αἱματώδη ποιεῖ τὸν χυλόν, δι' ὃ καὶ φόνον ἔνιοι καλοῦσι τὴν ἄκανθαν ταύτην· ἔχει δὲ καὶ τὴν ὀσμὴν δεινὴν καὶ φονώδη· ὀψὲ δὲ καὶ τελειοῖ τὸν καρπὸν πρὸς τὸ μετό-

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[1] ἀκάνων Ald.; ἀκαρνῶν mBas.; ἀκάνου or ἀκόρνης conj. Sch., the plural being awkward.

[2] πηνίοις conj. R. Const.; σπληνείοις U; σπληνίοις MAld; *colu* G and Plin. *l.c.*; *cf.* Diosc. 3. 107.

[3] σογκώδεις: Plin. *l.c.* seems to have read ὀγκώδεις (*torosiore caule*).

[4] καυλῶν conj. Scal. from Plin. *l.c.*; φύλλων Ald.

[5] μικρὸν conj. Spr. from Plin. *l.c.* (*minutum semen*); πικρὸν Ald.

[6] πώγωνος· σπερματώδεις Ald.: so U, but πωγωνος, and M, but

Pine-thistle[1] has but one kind, but there are different kinds of safflower, the wild and the cultivated. Again of the wild kind there are two forms, one very like the cultivated except that the stalk is straighter; wherefore in ancient times women sometimes used it to make distaffs.[2] It has a fruit which is black large and bitter. The other is leafy, and its stalks are like those of the sow-thistle,[3] so that to some extent it comes to have a prostrate stem; for on account of the softness of the stalks[4] it bends down towards the ground; and it has a small[5] fruit, which is bearded. All the forms produce abundant seed,[6] but it is larger[7] and more crowded in the wild forms. This kind has also a peculiarity as compared with other wild plants; these are usually coarser and more spinous than the cultivated forms, but in this plant the wild form is softer and smoother.

The *akorna* resembles in a general way in appearance the cultivated safflower, but has a yellowish colour and a sticky juice.[8] There is also a plant called distaff-thistle, which is whiter than these. A peculiarity of the leaf of this is that, if it is stripped off and applied to the flesh, the contact makes the juice blood-coloured,[9] wherefore some call this kind of spinous plant 'blood-wort'; also it has an abominable smell, like that of blood; it matures its fruit late,

πωγωνὸς: G. has *fructum amarum* (see last note) *frequentem barbaeque modo hirsutum gignit: sunt ambo seminosa.* W. conj. πωγωνοσπέρματα δ' εἰσὶ πᾶσαι, which is not convincing. I have retained the corrupt text and translate in the light of G.

[7] μείζοσι: sc. σπέρμασι, but σπερματώδεις cannot be right.

[8] χυλὸν add. St.; om. Ald.; *succo pingui* G; *pinguiore succo* Plin. *l.c.* [9] *cf.* 9. 1. 1. Plin. 21. 95.

πωρον. τὸ δ' ὅλον ὡς ἁπλῶς εἰπεῖν ἅπασα ἡ ἀκανικὴ φύσις ὀψίκαρπος. ἅπαντα δὲ ταῦτα φύεται καὶ ἀπὸ τοῦ σπέρματος καὶ ἀπὸ τῆς ῥίζης, ὥστε βραχύν τινα γίνεσθαι τὸν ἀνὰ μέσον χρόνον τῆς ἐκφύσεως τε καὶ τῆς τοῦ σπέρματος τελειώσεως.

7 Τοῦ σκολύμου δὲ οὐχ ὅτι τοῦτο μόνον ἴδιον, ὅτι τὴν ῥίζαν ἐδώδιμον ἔχει καὶ ἑφθὴν καὶ ὠμήν, ἀλλὰ καὶ ὅτι τότε ἀρίστην ὅταν ἀνθῇ καὶ ὅτι σκληρυνομένη ἀφίησιν ὀπόν. ἴδιον δὲ καὶ τὸ τῆς ἀνθήσεως· ἐπεὶ περὶ τροπάς.

8 Σαρκώδης δὲ καὶ ἐδώδιμος ἡ τοῦ σόγκου· ἡ δὲ κύησις οὐκ ἀκανώδης ἀλλὰ προμήκης αὐτοῦ· καὶ τοῦτ' ἴδιον μόνον ἔχει τῶν φυλλακάνθων ἀντεστραμμένως ἢ ὁ χαμαιλέων· ὁ μὲν γὰρ ἀφυλλάκανθος ὢν ἀκανίζει. γηράσκον δὲ τὸ ἄνθος ἐκπαποῦται, καθάπερ τὸ τῆς ἀπάπης καὶ τὸ τῆς μυρίκης καὶ ὅσα παραπλήσια τούτοις. παρακολουθεῖ δὲ μέχρι τοῦ θέρους τὸ μὲν κυοῦν τὸ δὲ ἀνθοῦν τὸ δὲ σπέρμα τίκτον, μικρὰν ἰκμάδα καὶ κέντρον ἔχον· ξηραινόμενον δὲ τὸ φύλλον διαχεῖται καὶ οὐκέτι κεντεῖ.

9 Ἡ ἰξίνη δὲ φύεται μὲν οὐ πολλαχοῦ, ῥιζόφυλλον δέ ἐστιν. ἀπὸ δὲ τῆς ῥίζης μέσης ὁ σπερματικὸς ἄκανος ἐπιπέφυκεν, ὥσπερ μῆλον εὖ

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[1] ἀκανικὴ conj. Bod., *cf.* 6. 4. 4 nn.; ἀκανθικὴ Ald.
[2] *cf.* Hes. *Op.* 582.
[3] σόγκου conj. C. Hoffmann; ὄγκου Ald.
[4] κύησις: *i.e.* flower-head. *cf.* κύημα 6. 4. 3; Plin. 21. 94.
[5] ἀκανώδης conj. Scal.; ἀκανθώδης Ald. *cf.* 6. 4. 3 nn.
[6] *cf.* 6. 4. 3. T.'s information seems to be incorrect, as

towards autumn. Indeed, generally speaking, all plants like the thistle-tribe [1] are late fruiting. All these plants grow both from seed and from the root, so that there is but a short period between the beginning of growth and the maturing of the seed.

Golden thistle has not only this peculiarity, that it has a root which is edible, whether boiled or raw, but the root is best when the plant is in flower, and, as it becomes hard, it produces a juice. The flowering time [2] is also peculiar, about the solstice.

The root of the sow-thistle [3] is also fleshy and edible; but the swollen part [4] is elongated and not thistle-like [5]; and, alone of the spinous-leaved plants, it has this peculiarity, in which it is the reverse of the chamaeleon,[6] (for that plant, though it has not spinous leaves, has a thistle-like flower-head). The flower of the sow-thistle, as it ages, turns into down, as do that of the dandelion [7] the tamarisk [8] and other plants like these. In its growth [9] there is a succession up to the summer, part forming flowers, part flowering, and part producing seed [10]; this [11] has little moisture in it and has a sharp point. The leaf, as it dries, becomes flaccid and no longer pricks.

Ixine does not grow in many places, and it has leaves on the root. From the middle of the root grows the seed-bearing thistle-head, which is like

both of the plants which he calls *χαμαιλέων* (see Index) have spinous leaves.

[7] *ἀπάπης* conj. Sch., *cf.* 7. 8. 3; *πάπνης* U; *δαπάνης* P; *δάφνης* Ald.

[8] *μυρίκης* conj. Sch.; *μυρίνης* M; *μυρρίνης* Ald.

[9] *cf.* Plin. *l.c.*

[10] *σπέρμα τίκτον* I conj.; *σπέρματος μὲν* Ald.H.; *σπερμοτόκουν* conj. Sch.

[11] Text perhaps defective.

μάλα ἐπικεκρυμμένον ὑπὸ τῶν φύλλων· οὗτος δὲ ἐπὶ τοῦ ἄκρου φέρει τὸ δάκρυον εὔστομον, καὶ τοῦτό ἐστιν ἡ ἀκανθικὴ μαστίχη. ταῦτα μὲν οὖν καὶ τὰ τοιαῦτα πανταχοῦ σχεδόν ἐστιν.

10 Ἡ δὲ κάκτος καλουμένη περὶ Σικελίαν μόνον, ἐν τῇ Ἑλλάδι δὲ οὐκ ἔστιν. ἴδιον δὲ παρὰ τἆλλα τὸ φυτόν· ἀφίησι γὰρ εὐθὺς ἀπὸ τῆς ῥίζης καυλοὺς ἐπιγείους, τὸ δὲ φύλλον ἔχει πλατὺ καὶ ἀκανθῶδες· καλοῦσι δὲ τοὺς καυλοὺς τούτους κάκτους· ἐδώδιμοι δέ εἰσι περιλεπόμενοι μικρὸν ἐπίπικροι, καὶ θησαυρίζουσιν αὐτοὺς ἐν ἅλμῃ.

11 Ἕτερον δὲ καυλὸν ὀρθὸν ἀφίησιν, ὃν καλοῦσι πτέρνικα· γίνεται δὲ καὶ οὗτος ἐδώδιμος πλὴν ἀθησαύριστος. τὸ δὲ περικάρπιον, ἐν ᾧ τὸ σπέρμα, τὴν μὲν μορφὴν ἀκανῶδες, ἀφαιρεθέντων δὲ τῶν παππωδῶν σπερμάτων ἐδώδιμον καὶ τοῦτο καὶ ἐμφερὲς τῷ τοῦ φοίνικος ἐγκεφάλῳ· καλοῦσι δὲ αὐτὸ σκαλίαν. τὰ μὲν οὖν φυλλάκανθα σκεπτέον ἐν τοιαύταις διαφοραῖς.

V. Τὰ δὲ καὶ παρὰ τὴν ἄκανθαν ἔχοντα φύλλον, οἷον τὰ τοιαῦτα φέως ὄνωνις παντάδουσα τρίβολος ἱππόφεως μυάκανθος . . . . τε σφόδρα καὶ τὸ φύλλον ἔχει σαρκῶδες· πολυ-

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[1] ὑπὸ conj. Sch.; ἐπὶ Ald.; Plin. *l.c. malum contectum sua fronde.* [2] *cf.* 9. 1. 3. [3] *cf.* Plin. 12. 72.

[4] Plin. 21. 97; Athen. 2. 83.

[5] πλατὺ add. Scal. from Athen. *l.c.*, *cf.* Plin. *l.c.*; om. Ald.H. The 'stems' are the petioles of the leaves.

[6] ἀκανῶδες conj. Sch.; ἀκανθῶδες Ald.

an apple and well hidden by[1] the leaves; this on its head produces its gum,[2] which is pleasant to the taste, and this is the 'thorn-mastich.'[3] These plants and others like them are found almost everywhere.

[4] But the plant called *kaktos* (cardoon) grows only in Sicily, and not in Hellas. It is a plant quite different from any other; for it sends up straight from the root stems which creep on the ground, and its leaf is broad[5] and spinous: these stems are called *kaktoi*; they are edible, if peeled, and are slightly bitter, and men preserve them in brine.

There is another kind which sends up an erect stem, called the *pternix*. This too is edible, but cannot be preserved. The fruit-vessel, which contains the seed, is in shape like a thistle-head[6]: and when the downy seeds are taken off, this too is edible and resembles the 'brain'[7] of the palm; and it is called *skalias*.[8] Such are the different characteristics in the light of which we may observe the spinous-leaved plants.

V. Examples of plants which have leaves as well as spines are *pheos*[9] rest-harrow star-thistle caltrop 'horse-*pheos*'[10] (spurge) butcher's broom[11] . . .,[12] and it has a fleshy leaf: it is much divided and has

[7] *i.e.* 'cabbage.' *cf.* 2. 6. 2.

[8] *ascaliam* Plin. *l.c.*; *ἀσκάληρον* Athen. *l.c.* Modern Greek *σκάληρα*. English 'bottom.' See Index *κάκτος* (2).

[9] *φέως* conj. St,; *φλέως* Ald. *cf.* 6. 1. 3.

[10] *ἱπποφέως* conj. Salm., *cf.* 6. 5. 2; *ἱππόφυον* Ald. *cf.* Plin. 21. 91.

[11] Diosc. 2. 125; Plin. 19. 151.

[12] Text defective: the end of one sentence is missing and the beginning of the next, containing the name of a plant. G attaches the following description to *φέως*. The plants presently described do not correspond to this list.

σχιδὲς δὲ καὶ πολύρριζον, οὐ μὴν κατὰ βάθους γε τὰς ῥίζας ἔχον. βλαστάνει δὲ ἅμα Πλειάδι καὶ τοῖς πρώτοις ἀρότοις[1] καὶ ἀφίησι τότε[2] τὸ φύλλον· οὐ γάρ ἐστιν ἐπέτειον ἀλλὰ χρονιώτερον.

2 Τὸ δὲ τῆς καππάριος ἴδιον, ὥσπερ ἐλέχθη, παρὰ ταῦτα· καὶ γὰρ τὸ φύλλον ἐπακανθίζον ἔχει καὶ τὸν καυλόν, οὐχ ὥσπερ ὁ φέως[4] καὶ ἱππόφεως ἀνάκανθα τοῖς φύλλοις· μονόρριζον δὲ καὶ ἐπίγειον καὶ χαμαίκαυλον· βλαστάνει δὲ καὶ ἀνθεῖ τοῦ θέρους καὶ διαμένει τὸ φύλλον χλωρὸν ἄχρι Πλειάδος. χαίρει δὲ ὑφάμμοις καὶ λεπτογείοις χωρίοις· λέγεται δὲ ὡς ἐν τοῖς ἐργασίμοις οὐ θέλει φύεσθαι, καὶ ταῦτα περὶ τὰ ἄστη καὶ ἐν εὐγείοις τόποις φυομένη καὶ οὐχ ὥσπερ σίλφιον ἐν ὀρεινοῖς· τοῦτο μὲν <οὖν> οὐ πάντως ἀληθές.

3 Ὁ δὲ τρίβολος ἴδιον ἔχει, διότι περικαρπιάκανθός ἐστι. δύο δ' αὐτοῦ γένη· τὸ μὲν γὰρ ἔχει φύλλον ἐρεβινθῶδες, ἕτερος δὲ φυλλάκανθος· ἐπίγειοι δὲ ἄμφω καὶ πολλαχῆ σχιζόμενοι· ὀψιβλαστὴς δὲ μᾶλλον ὁ φυλλάκανθος καὶ φύεται περὶ τὰς αὐλάς. τὸ δὲ σπέρμα τοῦ μὲν πρωΐου σησαμῶδες, τοῦ δὲ ὀψίου στρογγύλον ἐπίμελαν ἐν λοβῷ. καὶ τὰ μὲν οὖν παρὰ τὰ φύλλα καὶ ἄκανθαν ἔχοντα σχεδὸν ἐν τούτοις.

Ἡ δ' ὄνωνίς ἐστι πτορθάκανθον· ἐπέτειον δὲ τὸ φύλλον ἔχει πηγανῶδες παραπεφυκὸς παρ'

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[1] ἀρότοις conj. Bod.; ἀρότροις Ald. *cf.* 8. 1. 2.
[2] τότε conj. St.; τοῦτο Ald. [3] *cf.* Pall. 10. 13. 2.
[4] ὁ φέως conj. St.; ὕφεως Ald. Bas. Cam. H.; ὁ φλεὼς mBas.
[5] Plin. 21. 91.

many roots, but is not deep-rooting. It grows at the rising of the Pleiad, the first seed-time,[1] and then[2] puts forth its leaf; for it is not annual, but lives longer than one year.

[3] Caper, as was said, is quite distinct from these; it has a spinous leaf and a spinous stem, whereas *pheos*[4] and 'horse-*pheos*' have no spines on their leaves[5]; it has a single[6] root, is low-growing,[7] and has a creeping stem; it grows and flowers in summer, and the leaf remains green till the rising of the Pleiad. It rejoices in sandy light soils, and it is said that it is unwilling to grow on cultivated land, and that though it grows near towns and in good soil, and not, like silphium, in mountain country. This account however[8] is not altogether accurate.

[9] A peculiarity of caltrop is that it is spinous-fruited.[10] There are two kinds; one has a leaf like that of chick-pea, the other has spinous leaves. Both are low-growing and much divided, but the spinous-leaved form grows later and is found near enclosures. The seed of the early kind is like that of sesame, that of the late kind is round and blackish and enclosed in a pod. These may serve as examples of plants which have spines as well as leaves.[11]

[12] Rest-harrow has spines on the shoots; the leaf, which is annual,[13] is like that of rue, and grows right along the stem, so that the general appearance is

[6] Diosc. 2. 173 gives a different account.
[7] *cf.* 7. 8. 1.
[8] *οὖν* add. W. (in comm.) from G.
[9] Plin. 21. 98. [10] *cf.* 6. 1. 3.
[11] *τὰ μὲν οὖν παρὰ τὰ φύλλα* conj. Sch. (*οὖν* add. W.); *τὰ μὲν οὖν ὥσπερ ἀνάφυλλα* Ald.H. [12] Plin. 21. 98.
[13] I have altered the punctuation; *πτορθάκανθον, ἐπέτειον δέ· τὸ φ. κτλ.* W. after UMP.

ὅλον τὸν καυλόν, ὥστε καθάπερ στεφάνου τὴν ὅλην εἶναι μορφήν, διαλαμβανομένων ἐπαλλήλων· κολοβοανθὴς δὲ καὶ ἐλλοβόκαρπος ἀδιαφράκτως· φύεται δ' ἐν τῇ γλίσχρᾳ καὶ γανώδει καὶ μάλιστα ἐν τῇ σπορίμῳ καὶ γεωργουμένῃ, δι' ὃ καὶ πολέμιον τοῖς γεωργοῖς· καὶ ἔστι δυσώλεθρος· ὅταν γὰρ λάβῃ χώρας βάθος, ὠθεῖται κάτω εὐθὺς καὶ καθ' ἕκαστον ἔτος ἀποφύσεις ἀφεμένη εἰς τὰ πλάγια πάλιν εἰς τὸ ἕτερον ὠθεῖται κάτω· σπαστέα μὲν οὖν ὅλη· τοῦτο δὲ βραχείσης γίνεται τῆς γῆς καὶ ἀπόλλυται ῥᾷον· ἐὰν δὲ καὶ μικρὸν ἀπολειφθῇ, ἀπὸ τούτου πάλιν βλαστάνει· ἄρχεται δὲ τῆς βλαστήσεως θέρους τελειοῦται δὲ μετοπώρου. τὰ μὲν οὖν ἄγρια τῶν φρυγανικῶν ἐκ τούτων θεωρείσθω.

VI. Τὰ δὲ ἥμερα βραχεῖάν τινα ἔχει θεωρίαν, ἅπερ ἐν τοῖς στεφανωματικοῖς ἐστι.

Τὰ δὲ καθ' ὅλου πειρατέον περὶ στεφανωμάτων εἰπεῖν, ὅπως ἅπαν περιληφθῇ τὸ γένος. ἡ γὰρ στεφανωματικὴ φύσις ἰδίαν τινὰ ἔχει τάξιν, ἐπιμιγνυμένη δὲ τὰ μὲν τοῖς φρυγανικοῖς τὰ δὲ τοῖς ποιώδεσι· δι' ὃ κἀκεῖνα συμπεριληπτέον ἐπιμιμνησκομένους ὡς ἂν ᾖ ὁ καιρός, ἀρξαμένους πρῶτον ἀπὸ τῶν φρυγανικῶν. διχῇ δὲ ἡ τούτων

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[1] Evidently some conventional way of making a wreath.

[2] διαλαμβανομένων ἐπαλλήλων conj. W.; διαλαμβανομένην ὑπ' ἀλλήλων Ald. *cf.* Plat. *Prot.* 346 E, where the verb means 'to punctuate.'

[3] κολοβοανθὴς; *cf.* 8. 3. 3.

that of a garland,[1] the leaves being set at intervals alternately along it[2]; the flower is irregular,[3] and the fruit contained in a pod,[4] which is not divided into compartments.[5] It grows in sticky rich soil and especially in sown and cultivated land; wherefore it is an enemy to husbandmen, and it is hard to kill; for, when it gets hold of a piece of ground, it immediately pushes its roots down deep,[6] and every year it sends up new growths at the sides and the next year[7] it roots these again. Wherefore it has to be dragged up entire[8]; this is done when the ground has been moistened, and then it is easier to destroy. But, if but a small piece is left, it shoots again from this. It begins to grow in summer and completes its growth in autumn. Let these examples serve for a survey of the wild forms of under-shrubs.

Of cultivated under-shrubs (coronary plants), with which are included those coronary plants which are herbaceous.

VI. The cultivated kinds need but a brief survey; these[9] come under the class of coronary plants.

Of coronary plants we must endeavour to give a general account, so that the whole class may be included. This group has a somewhat peculiar position, since it overlaps partly the under-shrubs, partly the herbaceous plants; wherefore the latter must also be included and we must mention them as occasion serves, taking first the under-shrubs.

[1] ἐλλοβόκαρπος conj. Sch.; ἐλλοβοάνθης Ald.
[2] *cf.* 8. 5. 2.
[6] ὠθεῖται κάτω conj. Sch.; ὠθεῖ τὰ κάτω Ald.
[7] εἰς τὸ ἕτερον, sc. ἔτος; τῷ ἑτέρῳ conj. Sch.
[8] σπαστέα μὲν οὖν ὅλη conj. W.; σταθεῖσα μὲν οὕτως ὅλη Ald.
[9] ἅπερ conj. Sch.; εἴπερ UMAld.G.

διαίρεσις ἡ κατὰ τὴν χρείαν. τῶν μὲν γὰρ τὸ ἄνθος μόνον χρήσιμον· καὶ τούτων τὸ μὲν εὔοσμον, ὥσπερ ἴον, τὸ δ' ἄνοσμον, ὥσπερ διόσανθος φλόξ. τῶν δὲ καὶ οἱ κλῶνες καὶ τὰ φύλλα καὶ ὅλως ἡ πᾶσα φύσις εὔοσμος, οἷον ἑρπύλλου ἑλενίου σισυμβρίου τῶν ἄλλων. ἄμφω δὲ φρυγανικά. κἀκείνων τῶν ἀνθικῶν πολλῶν ἡ φύσις φρυγανώδης, ἡ μὲν ἐπέτειος οὖσα μόνον, ἡ δὲ πολυχρονιωτέρα, πλὴν ἰωνίας τῆς μελαίνης· αὕτη γὰρ ἄκλων ὅλως ἀλλὰ προσριζόφυλλος καὶ ἀείφυλλος, ὡς δέ τινές φασι καὶ δυναμένη δι' ὅλου φέρειν τὸ ἄνθος, ἐὰν τρόπῳ τινὶ θεραπεύηται. τοῦτο μὲν ἴδιον ἂν ἔχοι.

3 Τῶν δὲ ἄλλων μᾶλλον δὲ τῶν πάντων αἱ μὲν ὅλαι μορφαὶ σχεδὸν πᾶσι φανεραί· εἰ δέ τινας ἄλλας ἰδιότητας ἔχουσι, ταύτας λεκτέον, οἷον εἰ τὰ μὲν ἁπλᾶ δοκεῖ τοῖς εἴδεσιν εἶναι τὰ δὲ ἔχειν διαφοράς.

Ἁπλᾶ μὲν οὖν τὰ ξυλώδη, καθάπερ ἕρπυλλος σισύμβριον ἑλένιον· πλὴν εἰ τὰ μὲν ἄγρια τὰ δὲ ἥμερα καὶ <τὰ μὲν> εὔοσμα τὰ δὲ ἀοσμότερά ἐστι· τούτων δὲ καὶ αἱ θεραπεῖαι καὶ αἱ χῶραι διάφοροι καὶ οἱ ἀέρες. ἔνια δὲ καὶ τῶν ἀνθῶν, οἷον τὸ μέλαν ἴον· οὐ γὰρ ἔχειν δοκεῖ τοῦτο διαφορὰν

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[1] Plin. 21. 59.

[2] So Plin. *l.c.*; but Nic. *ap.* Athen. 15. 31 calls this flower fragrant.

[3] πολλῶν conj. W.; πολλὰ UMAld.

[4] οἷον εἰ conj. W.; ὅτι Ald. [5] οὖν conj. W.; οἷον Ald.

[1] These may be divided into two groups according to their uses. Of some only the flower is serviceable; and of these some are sweet-scented, as gilliflower, some scentless, as carnation [2] and wallflower. Of others again the branches leaves and in fact the whole growth are sweet-scented, as with tufted thyme calamint bergamot-mint and the rest. Both groups however belong to the under-shrubs. And of the first-mentioned, those valued for their flowers, the growth is in most [3] cases that of under-shrubs, (in some annual merely, in others of longer duration) except in the violet; for this is altogether without branches, its leaves grow close to the root, and it is always in leaf; while, as some say, it is able to bear flowers continuously, if it is tended in a certain way. This may be considered a peculiar characteristic of this plant.

Of the others, or rather of all the group, the general appearance is in each case plain to all; any peculiarities that they may exhibit we must mention, for instance, if [4] some appear to have but a single form, while others have various forms.

Thus [5] those of woody character, as tufted thyme bergamot-mint calamint, have but one form, unless one counts wild and cultivated, scented and scentless plants, as belonging to distinct forms; and again there are with these plants differences of culture of position and of climate. Some also [6] of the group valued for their flowers [7] have each but one form, for instance, the black *ion* (violet); for this does not appear to have different forms

[6] ἔνια δὲ καὶ conj. W.; ἔνιοι δὲ UMAld.

[7] ἀνθῶν in the sense of ἀνθικῶν § 2, which perhaps should be read here.

ὥσπερ τὸ λευκόν· ἐμφανὴς γὰρ ἡ τούτων χροιὰ διαλλάττουσα, καὶ ἔτι δὴ μᾶλλον ἡ τῶν κρίνων, εἴπερ δή, καθάπερ φασίν, ἔνια καὶ πορφυρᾶ ἐστι.

4 Τῶν δὲ ῥόδων πολλαὶ διαφοραὶ πλήθει τε φύλλων καὶ ὀλιγότητι καὶ τραχύτητι καὶ λειότητι καὶ εὐχροίᾳ καὶ εὐοσμίᾳ. τὰ μὲν γὰρ πλεῖστα πεντάφυλλα, τὰ δὲ δωδεκάφυλλα καὶ εἰκοσίφυλλα, τὰ δ' ἔτι πολλῷ πλεῖον ὑπεραίροντα τούτων· ἔνια γὰρ εἶναί φασιν ἃ καὶ καλοῦσιν ἑκατοντάφυλλα· πλεῖστα δὲ τὰ τοιαῦτά ἐστι περὶ Φιλίππους· οὗτοι γὰρ λαμβάνοντες ἐκ τοῦ Παγγαίου φυτεύουσιν· ἐκεῖ γὰρ γίνεται πολλά· σμικρὰ δὲ σφόδρα τὰ ἐντὸς φύλλα· ἡ γὰρ ἔκφυσις αὐτῶν οὕτως ὥστε εἶναι τὰ μὲν ἐκτὸς τὰ δ' ἐντός· οὐκ εὔοσμα δὲ οὐδὲ μεγάλα τοῖς μεγέθεσιν. ἐν δὲ τοῖς μεγά-

5 λοις εὐώδη μᾶλλον ὧν τραχὺ τὸ κάτω. τὸ δὲ ὅλον, ὥσπερ ἐλέχθη, καὶ ἡ εὔχροια καὶ ἡ εὐοσμία παρὰ τοὺς τόπους ἐστίν· ἐπεὶ καὶ τὰ ἐν γῇ τῇ αὐτῇ γινόμενα ποιεῖ τινα παραλλαγὴν εὐοσμίας καὶ ἀοσμίας. εὐοσμότατα δὲ τὰ ἐν Κυρήνῃ, δι' ὃ καὶ τὸ μύρον ἥδιστον. ἁπλῶς δὲ καὶ τῶν ἴων καὶ τῶν ἄλλων ἀνθῶν ἄκρατοι μάλιστα ἐκεῖθι

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[1] *cf.* 6. 8. 1 n.; Diosc. 3. 102.
[2] Plin. 21. 14–21; Athen. 15. 29.
[3] *i.e.* of the bark. *cf.* Plin. 21. 17, *scabritia corticis.*
[4] Sc. in 'double' roses.
[5] *i.e.* the hip; called ὄμφαλος Arist. *Probl.* 12. 8, where the same statement is made; called μῆλον below, § 6.

like the white *ion* (gilliflower) in which the colour evidently varies; as does still more that of the lilies, if it be true, as some say, that there is a crimson kind.[1]

[2] Among roses there are many differences, in the number of petals, in roughness,[3] in beauty of colour, and in sweetness of scent. Most have five petals, but some have twelve or twenty, and some a great many more than these; for there are some, they say, which are even called 'hundred-petalled.' Most of such roses grow near Philippi; for the people of that place get them on Mount Pangaeus, where they are abundant, and plant them. However the inner petals[4] are very small, (the way in which they are produced being such that some are outside, some inside). Some kinds are not fragrant nor of large size. Among those which have large flowers those in which the part[5] below the flower is rough are the more fragrant. In general, as has been said, good colour and scent depend upon locality; for even bushes which are growing in the same[6] soil shew some variation in the presence or absence of a sweet scent. Sweetest-scented of all are the roses of Cyrene, wherefore the perfume made from these is the sweetest. (Indeed it may be said generally that the scents[7] of the gilliflowers[8] also and of the other flowers of that place are the purest, and especially the

[6] *τῇ αὐτῇ* conj. Sch.; *τοιαύτῃ* U; *τοιαῦτα* M.

[7] *ἄκρατοι μάλιστα ἐκεῖθι αἱ ὀσμαί* conj. Sch. after Saracenus on Diosc. 1. 25; Athen. *l.c.* (*ἄκρατοι μάλιστα καὶ θεῖαι αἱ ὀσμαί*); *ἄκρατοι· μάλιστα δ' ἐκείνου αἱ ὀσμαί* Ald.; *ἐκεῖ αἱ ὀσμαὶ* (rest uncertain) U. *cf. C.P.* 6. 18. 3.

[8] ? violets and gilliflowers; see Index.

αἱ ὀσμαί, διαφερόντως δὲ τοῦ κρόκου· πλεῖστον
6 γὰρ οὗτος δοκεῖ παραλλάττειν. φύεται μὲν οὖν
ἡ ῥοδωνία καὶ ἐκ τοῦ σπέρματος· ἔχει δὲ ὑπὸ τὸ
ἄνθος ἐν τῷ μήλῳ κνηκῶδες ἢ ἀκανῶδες, ἔχον δέ
τινα χνοῦν ὥστε ἐγγὺς εἶναι τῶν παππωδῶν
σπερμάτων· οὐ μὴν ἀλλὰ διὰ τὸ βραδέως παρα-
γίνεσθαι κατακόπτοντες, ὡς ἐλέχθη, τὸν καυλὸν
φυτεύουσιν. ἐπικαιομένη δὲ καὶ ἐπιτεμνομένη
βέλτιον φέρει τὸ ἄνθος· ἐωμένη γὰρ ἐξαύξεται
καὶ ἀπολοχμοῦται. δεῖ δὲ καὶ μεταφυτεύειν
πολλάκις· καὶ γὰρ οὕτω φασὶ κάλλιον γίνεσθαι
τὸ ῥόδον. αἱ δ' ἄγριαι τραχύτεραι καὶ ταῖς
ῥάβδοις καὶ τοῖς φύλλοις, ἔτι δὲ ἄνθος ἀχρού-
στερον ἔχουσι καὶ ἔλαττον.
7 Τὸ δὲ ἴον τὸ μέλαν τοῦ λευκοῦ διαφέρει κατά
τε ἄλλα καὶ κατ' αὐτὴν τὴν ἰωνίαν, ὅτι πλατύ-
φυλλός τε καὶ ἐγγειόφυλλος καὶ σαρκόφυλλός
ἐστι, πολλὴν ἔχουσα ῥίζαν.
8 Τὰ δὲ κρίνα τῇ μὲν χροιᾷ τὴν εἰρημένην ἔχει
διαφοράν. μονόκαυλα δέ ἐστιν ὡς ἐπὶ πᾶν,
δικαυλεῖ δὲ σπανίως· τάχα δὲ τοῦτο χώρας καὶ
ἀέρος διαφορᾶς. καθ' ἕκαστον δὲ καυλὸν ὁτὲ μὲν
ἓν κρίνον ὁτὲ δὲ πλείω γίνεται· βλαστάνει γὰρ
τὸ ἄκρον· σπανιώτερα δὲ ταῦτα· ῥίζαν δὲ ἔχει
πολλὴν σαρκώδη καὶ στρογγύλην· ὁ δὲ καρπὸς

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[1] διαφερόντως δὲ τοῦ κρόκου conj. Saracenus from Athen. *l.c.*; διαφερόντως δὴ τοῦ χρόνου Ald. *cf* Callim. *Hymn to Apollo* 83, whence it appears that an autumnal crocus (*crocus sativus*) is meant. See below § 10.

[2] ἀκάνωδες conj. Sch. from G, *acanaceum*; ἀνθώδες UMAld.

[3] παππωδῶν conj. Sch.; πρώτων Ald.

[4] Plin. 21. 27.

scent of the saffron-crocus,[1] a plant which seems to vary in this respect more than any other). Roses can be grown from seed, which is to be found below the flower in the 'apple,' and is like that of safflower or pine-thistle,[2] but it has a sort of fluff, so that it is not unlike the seeds which have a pappus.[3] As however the plant comes slowly from seed, they make cuttings of the stem, as has been said, and plant them. If the bush is burnt or cut over, it bears better flowers; for, if left to itself, it grows luxuriantly and makes too much wood. Also it has to be often transplanted; for then, they say, the roses are improved. The wild kinds are rougher both in stem and in leaf, and have also smaller flowers of a duller colour.

[4] The black *ion* (violet) differs from the white *ion* (gilliflower) not only in other respects but in the plant itself, in that in the former the leaves are broad, lie close to the ground, and are fleshy, and there is much root.

[5] *Krina* (lilies) shew the variation in colour which has been already mentioned.[6] The plant has in general a single stem, but occasionally divides into two, which may be due to differences[7] in position and climate. On each stem grows sometimes one flower, but sometimes more; (for it is the top of the stem which produces the flower[8]) but this sort is less common. There is an ample root, which is fleshy and round. If the fruit is taken off, it

[6] Plin. 21. 25. The account of *herbaceous* coronary plants seems to begin here. *cf.* 6. 6. 10. [6] 6. 6. 3.

[7] διαφορᾶς U; διαφορᾷ W. after Sch.

[8] βλαστάνει. But this word in T. has usually a more general sense. ? 'for in that case the top of the stem branches' (lit. 'makes fresh growth').

ἀφαιρούμενος ἐκβλαστάνει καὶ ἀποδίδωσι τὸ κρίνον πλὴν ἔλαττον. ποιεῖ δέ τινα καὶ δακρυώδη συρροήν, ἣν καὶ φυτεύουσιν, ὥσπερ εἴπομεν.

9 Ὁ δὲ νάρκισσος ἢ τὸ λείριον, οἱ μὲν γὰρ τοῦτο οἱ δ' ἐκεῖνο καλοῦσι, τὸ μὲν ἐπὶ τῇ γῇ φύλλον ἀσφοδελῶδες ἔχει, πλατύτερον δὲ πολύ, καθάπερ ἡ κρινωνία, τὸν δὲ καυλὸν ἄφυλλον μὲν ποώδη δὲ καὶ ἐξ ἄκρου τὸ ἄνθος, καὶ ἐν ὑμένι τινὶ καθάπερ ἐν ἀγγείῳ <καρπὸν> μέγαν εὖ μάλα καὶ μέλανα τῇ χροιᾷ σχήματι δὲ προμήκη. οὗτος δ' ἐκπίπτων ποιεῖ βλάστησιν αὐτόματον· οὐ μὴν ἀλλὰ καὶ συλλέγοντες πηγνύουσι καὶ τὴν ῥίζαν φυτεύουσιν. ἔχει ῥίζαν σαρκώδη στρογγύλην μεγάλην. ὄψιον δὲ σφόδρα· μετὰ γὰρ Ἀρκτοῦρον ἡ ἄνθησις καὶ περὶ ἰσημερίαν.

10 Ὁ δὲ κρόκος ποώδης μὲν τῇ φύσει, καθάπερ καὶ ταῦτα, πλὴν φύλλῳ στενῷ, σχεδὸν γὰρ ὥσπερ τριχόφυλλόν ἐστιν· ὀψιανθὲς δὲ σφόδρα καὶ ὀψιβλαστὲς ἢ πρωϊανθές, ὁποτέρως τις λαμβάνοι τὴν ὥραν· <μετὰ> Πλειάδα γὰρ ἀνθεῖ καὶ ὀλίγας ἡμέρας· εὐθὺς δ' ἅμα τῷ φύλλῳ καὶ τὸ ἄνθος ὠθεῖ· δοκεῖ δὲ καὶ πρότερον· ῥίζα δὲ πολλὴ καὶ σαρκώδης, καὶ τὸ ὅλον εὔζωον· φιλεῖ δὲ καὶ πατεῖσθαι καὶ γίνεται καλλίων κατατριβομένης

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[1] *cf.* 2. 2. 1 n., 9. 14; *C.P.* 1. 4. 4–6. Plin. 21. 26 describes a method of artificially producing crimson lilies from the bulbils of a white lily. *cf. Geop.* 11. 20.

[2] *cf.* 6. 8. 1 and 3. See Index. [3] *cf.* 7. 13. 1.

[4] ποώδη: *cf.* 4. 10. 3.

germinates and produces a fresh plant, but of smaller size; the plant also produces a sort of tear-like exudation, which men also plant, as we have said.[1]

The narcissus[2] or *leirion* (for some call it by the one name, some by the other) has its ground-leaves like those of the asphodel,[3] but much broader, like those of the *krinon* (lily); its stem is leafless and grass-green[4] and bears the flower at the top; the fruit[5] is in a kind of membrane-like vessel, and is very large, black in colour, and oblong in shape. This as it falls germinates of its own accord; however men collect and set[6] the seed, and also plant the root, which is fleshy round and large. The plant blooms very late,[7] after the setting of Arcturus about the equinox.

[8] The saffron-crocus is herbaceous in character, like the above-mentioned plants,[9] but has a narrow leaf; indeed the leaves are, as it were, hair-like; it blooms very late, and grows either late or early, according as one looks at the season[10]; for it blooms after[11] the rising of the Pleiad and only for a few days. It pushes up the flower at once with the leaf, or even seems to do so earlier. The root[12] is large and fleshy, and the whole plant vigorous; it loves even to be trodden on and grows fairer when the root is crushed into the ground by the

[5] *καρπὸν* omitted in MSS.; add. Dalec. from Diosc. 4. 158.
[6] *πηγνύουσι*: *cf.* 7. 4. 3 n.
[7] *cf. C.P.* 1. 10. 5; Plin. *l.c.* (a much confused passage).
[8] Plin. 21. 31–34.
[9] Sc. *κρίνον* and *νάρκισσος*; *cf.* 6. 6. 8 n.
[10] *i.e.* whether at the end of one season or the beginning of the next. *cf. C.P.* 1. 10. 5. *λαμβάνοι* U; *λαμβάνει* Ald.
[11] *μετὰ* add. W. [12] *cf.* 7. 9. 4.

πάτῳ τῆς ῥίζης· δι' ὃ καὶ παρὰ τὰς ὁδοὺς καὶ ἐν τοῖς κροτητοῖς κάλλιστος. ἡ δὲ φυτεία ἀπὸ ῥίζης.

11 Ταῦτα μὲν οὖν οὕτω γεννᾶται. τὰ δ' ἄλλα ἄνθη τὰ προειρημένα πάντα σπείρεται, οἷον ἰωνία διόσανθος ἴφυον φλὸξ ἡμεροκαλλές· καὶ γὰρ αὐτὰ καὶ αἱ ῥίζαι ξυλώδεις· σπείρεται δὲ καὶ ἡ οἰνάνθη· καὶ γὰρ καὶ τοῦτο ἀνθῶδες. τὰ μὲν οὖν ἀνθικὰ σχεδὸν ἐν τούτοις καὶ τοῖς ὁμοίοις ληπτέον.

VII. Τὰ δὲ ἕτερα πάντα μὲν ἀνθεῖ καὶ σπερμοφορεῖ, δοκεῖ δὲ οὐ πάντα διὰ τὸ μὴ φανερὸν εἶναί τινων τὸν καρπόν· ἐπεὶ καὶ τὸ ἄνθος ἐνίων ἀμαυρόν· ἀλλ' ὅτι βραδέως καὶ χαλεπωτέρως παραγίνεται, τῇ φυτείᾳ χρῶνται μᾶλλον,
2 ὥσπερ ἐλέχθη καὶ κατ' ἀρχάς. καίτοι διατείνονταί τινες ὡς οὐκ ἐχόντων καρπόν· οἵ τε πεπειρᾶσθαι φάσκοντες καὶ τούτων εἰσίν, αὐτοὶ γὰρ ξηρᾶναι πολλάκις καὶ ἀποτρίψαι καὶ σπεῖραι, καὶ οὐδεπώποτε βλαστεῖν οὔτε ἔρπυλλον οὔτε ἑλένιον οὔτε σισύμβριον οὔτε μίνθαν· πεπειρᾶσθαι γὰρ καὶ ταύτης. ἀλλ' ὅμως ἐκεῖνο ἀληθέστερον, ἥ τε τῶν ἀγρίων φύσις ἐπιμαρτυρεῖ· καὶ γὰρ ἔρπυλλός ἐστιν ἄγριος, ὃν κομίζοντες ἐκ τῶν ὀρῶν φυτεύουσι καὶ ἐν Σικυῶνι καὶ Ἀθήνῃσιν ἐκ τοῦ Ὑμηττοῦ· παρ' ἄλλοις δὲ ὅλως ὄρη πλήρη καὶ λόφοι, καθάπερ ἐν τῇ Θράκῃ· καὶ σισύμβριον

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[1] πάτῳ conj. Turneb. and others ; κάτω Ald.
[2] κροτητοῖς : Plin. *l.c. iuxta semitas ac fontes.* Did he read κρουνοῖς ?
[3] ἀνθικὰ conj. Scal.; ἀκανθικὰ Ald. *cf.* 6. 6. 2.
[4] ἀλλ' ὅτι conj. W. from G ; ἄλλα δὲ UMPAld.

foot[1]: wherefore it is fairest along the roads and in well-worn places.[2] It is propagated from the root.

These are the ways then in which the above plants are grown. All the above-mentioned flowers are grown from seed, as gilliflower carnation spike-lavender wall-flower martagon-lily; these plants themselves, as well as their roots, are woody. Drop-wort is also grown from seed; for that too is a plant grown for its flower. These and other plants like them may serve as examples of plants grown for their flowers.[3]

VII. All the others flower and bear seed, though they do not all appear to do so, since in some cases the fruit is not obvious. Indeed in some the flower too is inconspicuous, but, because[4] these grow slowly and with some difficulty, men propagate them rather by off-shoots, as was said at the beginning. However some contend that they have no fruit: and there are men who have actually tried with the following plants[5]; they have, they say, themselves often dried and rubbed out and sown the apparent fruit of thyme calamint bergamot-mint and green mint (for even that they have tried) and there was no germination from such sowing. However, the account given above is the truer, and the character of the wild forms testifies to this; for there is also a wild thyme (Attic thyme[6]), which they bring from the mountains and plant at Sicyon, or from Hymettus and plant at Athens; and in other districts the mountains and hills[7] are quite covered with it, for instance in Thrace. There is also a

[5] *οἵ τε . . . εἰσίν* transposed by Sch.; in MSS. after *ἀληθέστερον*.

[6] Plin. 19. 172; Athen. 15. 28.

[7] *λόφοι* conj. W.; *τόποι* Ald.

δὲ καὶ τἆλλα δριμυτέραν ἔχοντα τὴν ὀσμήν· ἔρπυλλος δ' ἐνίοτε[1] καὶ παντελῶς θυμώδης· ἃ δῆλον ὅτι ταύτην τὴν γένεσιν λαμβάνει.

3 Ἀβρότονον δὲ μᾶλλον ἀπὸ σπέρματος βλαστάνει ἢ ἀπὸ ῥίζης καὶ παρασπάδος· χαλεπῶς δὲ καὶ ἀπὸ σπέρματος· προμοσχευόμενον <δὲ> ἐν ὀστράκοις, ὥσπερ οἱ Ἀδώνιδος κῆποι, τοῦ θέρους· δύσριγον γὰρ σφόδρα καὶ ὅλως ἐπίκηρον καὶ ὅποι ὁ ἥλιος σφόδρα λάμπει· ἐμβιῶσαν δὲ καὶ αὐξηθὲν μέγα καὶ ἰσχυρὸν καὶ δενδρῶδες ὥσπερ τὸ πήγανον, πλὴν ξυλωδέστερον πολὺ τοῦτο καὶ ξηρότερον καὶ αὐχμωδέστερον.

4 Ὁ δὲ ἀμάρακος ἀμφοτέρως φύεται, καὶ ἀπὸ παρασπάδος καὶ ἀπὸ σπέρματος· πολύσπερμον δέ, καὶ τὸ σπέρμα εὔοσμον ὀσμῇ μαλακωτέρᾳ· δύναται δὲ καὶ μεταφυτεύεσθαι. πολύσπερμον δὲ καὶ τὸ ἀβρότονον καὶ οὐκ ἄοσμον. τοῦτο δὲ ῥίζας μὲν ἔχει ὀρθὰς καὶ κατὰ βάθους. ἔστι γὰρ ὥσπερ μονόρριζον τῇ παχείᾳ τὰς δ' ἄλλας <ἀφίησιν> ἀπ' αὐτῆς· ὁ δ' ἀμάρακος καὶ ὁ ἔρπυλλος καὶ τὸ σισύμβριον καὶ τὸ ἑλένιον ἐπιπολαίους καὶ πολυσχιδεῖς καὶ ταρρώδεις· ξυλώδεις δὲ πᾶσαι, πολὺ δὲ μᾶλλον ἡ τοῦ ἀβροτόνου καὶ διὰ τὸ μέγεθος καὶ τῇ ξηρότητι.

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[1] *ἐνίοτε* conj. W.; *ἐνίοις* Ald.

[2] Plin. 21. 57. Description of various forms of *ἔρπυλλος* has perhaps dropped out after this word: *cf.* § 5, *καθάπερ ἐλέχθη.*

[3] *i.e.* from seed. *ταύτην* conj. W.; *πάντα* UMAld.; ? *τάντα ταύτην.*

[4] Plin. 21. 34: *cf. C.P.* 1. 4. 2. *ἀβρότονον . . . θέρους*, text nearly as given by Ald. and by UM (?)—supported by Plin.

wild bergamot-mint, and wild forms of the other plants mentioned, having a more pungent smell. Thyme is sometimes[1] quite like cultivated thyme.[2] Now it is plain that these wild forms possess this means of reproducing themselves.[3]

Southernwood actually grows more readily from seed than from a root[4] or a piece torn off (though it grows even from seed with difficulty); however it can be propagated by layering in pots in summer-time, like the 'gardens of Adonis'[5]; it is indeed very sensitive[6] to cold and generally delicate even where the sun shines brightly; but, when it is established and has grown, it becomes tall and strong and tree-like, like rue, except that the latter is much more woody drier and less succulent.

[7] Sweet marjoram grows in either way, from pieces torn off or from seed; it produces a quantity of seed, which is fragrant with a delicate scent; it can also be transplanted.[8] Southernwood also produces much seed, which has some scent. This plant has straight roots which run deep; it has, as it were, its single stout root, from which the others spring;[9] while sweet marjoram thyme bergamot-mint and calamint have surface[10] roots which are much divided and matted; in all these plants the roots are woody, but especially in southernwood, because of its size and because it is so dry.

l.c. so far as that passage is intelligible—but δὲ before *ἐν ὀστράκοις* add. W.; after *ἐν ὀστρ.* supply *βλαστάνει.*

[5] *cf.* Plat. *Phaedo* 276 B and Thompson's n. Sir W. Thiselton-Dyer in *Companion to Greek Studies*, § 99, p. 65.

[6] *cf C.P.* 4. 3. 2. [7] Plin. 21. 61.

[8] *μεταφυτεύεσθαι* conj. Sch. from G; *μεταφύεσθαι* Ald.

[9] *ἀφίησιν* add. W.

[10] *ἐπιπολαίους* conj. Scal.; *ἐπὶ πολλοὺς* MAld. *cf. C.P.* 2. 16. 5.

5 Τοῦ δὲ ἑρπύλλου ἴδιος ἡ αὔξησις ἡ τῶν βλαστῶν· δύναται γὰρ ἐφ' ὁσονοῦν προϊέναι κατὰ μῆκος χάρακα λαβὼν ἢ πρὸς αἱμασιὰν φυτευθεὶς ἢ κάτω καθιέμενος· εὐαυξέστατος δὲ εἰς φρέαρ. εἴδη δὲ τοῦ μὲν ἡμέρου λαβεῖν οὐκ ἔστι, καθάπερ ἐλέχθη. τοῦ δὲ ἀγρίου φασὶν εἶναι. τοῦ γὰρ ἐν τοῖς ὄρεσιν τὸν μὲν θυμβρώδη τινὰ καὶ δριμύτατον τὸν δ' εὔοσμον εἶναι καὶ μαλακώτερον.

6 Ὥρα δὲ τῆς φυτείας πλείστων μετόπωρον, ἐν ᾧ σπεύδουσιν ὡς πρῶτα φυτεύειν· οὐ μὴν ἀλλ' ἔνια καὶ τοῦ ἦρος φυτεύουσιν. ἅπαντα φιλόσκια καὶ φίλυδρα καὶ φιλόκοπρα μάλιστα· αὐχμὸν δὲ δέχεται καὶ ὅλως ὀλιγοϋδρότατος ὁ ἕρπυλλος. κόπρῳ δὲ χαίρει, μάλιστα δὲ καὶ τῇ τῶν λοφούρων· φασὶ δὲ καὶ μεταφυτεύειν δεῖν πολλάκις· καλλίω γάρ. τὸ δὲ σισύμβριον, ὥσπερ ἐλέχθη, καὶ ἐξίσταται μὴ μεταφυτευόμενον.

VIII. Τῶν δ' ἀνθῶν τὸ μὲν πρῶτον ἐκφαίνεται τὸ λευκόϊον, ὅπου μὲν ὁ ἀὴρ μαλακώτερος εὐθὺς τοῦ χειμῶνος, ὅπου δὲ σκληρότερος ὕστερον, ἐνιαχοῦ τοῦ ἦρος. ἅμα δὲ τῷ ἴῳ ἢ μικρόν τι ὕστερον καὶ τὸ φλόγινον καλούμενον τὸ ἄγριον·

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[1] *cf.* Plin. 20. 245 and 246 (not from T.); *C.P.* 2. 18. 2; Diosc. 3. 38; Index ἕρπυλλος.

[2] *cf.* Plin. 19. 172, which refers however to *σισύμβριον*; Nic. *ap.* Athen. 15. 31.

[3] Plin. 21. 61.

[1] The growth of the shoots of thyme is peculiar. If it has a stake, or is planted against a wall, it can send them out to any length; so also if it is let grow downwards; indeed it is most vigorous when grown into a pit.[2] It is not possible to distinguish different forms of the cultivated kind, as has been said, but they say that of the wild kind (Attic thyme) there is more than one form; for that of the kind which grows on the mountains one form is like savory and very pungent, while the other is fragrant and more delicate.

[3] The season for planting most of these is autumn, and then men hasten to plant them as early as possible; however some are planted also in spring. All of them love shade,[4] water, and especially dung; however thyme is patient of drought and, in general, needs moisture less than the others. These plants especially delight in the dung of beasts of burden; and it is said that they should often be transplanted, for that it improves them, while bergamot-mint, as has been said, actually degenerates[5] if it is not transplanted.

Of the seasons at which coronary plants flower, and of the length of their life.

VIII. [6] Of the flowers the[7] first to appear is the gilliflower; where the air is mild, it appears as soon as winter comes, but, where it is more severe, later, sometimes in spring. Along with the gilliflower, or a little later, appears the flower called the wild wall-

[4] *φιλόσκια* conj. Scal. from G; *φιλοίκια* UMAld. *cf.* Plin. *l.c.*
[5] *ἐξίσταται* conj. Scal. from G, *degenerat*; *ἐξήτασται* MAld.
[6] Plin. 21. 64–66; Athen. 15. 26 and 27. *ἀνθῶν*: ? in the sense of *ἀνθικῶν*, as in 6. 6. 3.
[7] *τὸ* conj. Scal.; *τοῦ* Ald.

ταῦτα γὰρ ὧν οἱ στεφανήπλοκοι χρῶνται πολὺ ἐκτρέχει τῶν ἄλλων. μετὰ δὲ ταῦτα ὁ νάρκισσος καὶ τὸ λείριον, <καὶ τῶν ἀγρίων ἀνεμώνης γένος τὸ καλούμενον ὄρειον,> καὶ τὸ τοῦ βολβοῦ κώδυον· ἐμπλέκουσι γὰρ ἔνιοι καὶ τοῦτο εἰς τοὺς στεφάνους. ἐπὶ δὲ τούτοις ἡ οἰνάνθη καὶ τὸ μέλαν ἴον καὶ τῶν ἀγρίων ὅ τε ἐλειόχρυσος καὶ τῆς ἀνεμώνης ἡ λειμωνία καλουμένη καὶ τὸ ξίφιον καὶ ὑάκινθος καὶ σχεδὸν
2 ὅσοις ἄλλοις χρῶνται τῶν ὀρείων. τὸ δὲ ῥόδον ὑστερεῖ τούτων καὶ τελευταῖον μὲν φαίνεται, πρῶτον δ' ἀπολείπει τῶν ἐαρινῶν· ὀλιγοχρονία γὰρ ἡ ἄνθησις. ὀλιγοχρόνια δὲ καὶ τῶν ἀγρίων τὰ λοιπὰ πλὴν τῆς ὑακίνθου καὶ τῆς ἀγρίας καὶ τῆς σπαρτῆς· αὕτη δὲ διαμένει καὶ τὸ λευκὸν ἴον καὶ ἔτι πλείω τὸ φλόγινον· τὸ δὲ δὴ μέλαν ἴον, ὥσπερ εἴρηται, δι' ἐνιαυτοῦ θεραπείας τυγχάνον. ὡσαύτως δὲ καὶ ἡ οἰνάνθη, καὶ γὰρ τοῦτο ἀνθικὸν μὲν ποῶδες δὲ τὴν φύσιν, ἐάν τις ἀποκνίζῃ καὶ ἀφαιρῇ τὸ ἄνθος καὶ μὴ ἐᾷ σπερματοῦσθαι καὶ ἔτι τόπον εὔειλον ἔχῃ· τὸ δὲ ἄνθος βοτρυῶδες καὶ λευκὸν καθάπερ τῶν ἀγρίων . . . ταῦτα μὲν οὖν ὥσπερ ἐαρινὰ φαίνεται.

3 Τὰ δὲ θερινὰ μᾶλλον ἥ τε λυχνὶς καὶ τὸ διόσανθος καὶ τὸ κρίνον καὶ τὸ ἴφυον καὶ ὁ

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[1] Evidently both distinct from the *νάρκισσος ἢ λείριον* of 6. 6. 9; 6. 8 3. See Index.

[2] *καὶ τῶν . . . ὄρειον* ins. Sch. from Athen. *l.c.* with alteration of *ὀρείων* to *ἀγρίων*. *cf.* Plin. *l.c.*

[3] *i.e.* the *flower* of muscari, mentioned in this way because elsewhere (*e.g.* 7. 12. 1) the edible *root* is in question, which was properly called *βολβός*.

[4] *cf.* 9. 19. 3. [5] See Index.

flower. These, of all the flowers that the garland-makers use, far outrun the others. After these come pheasant's eye[1] and polyanthus[1] narcissus (and, among wild plants, the kind of anemone which is called the 'mountain anemone')[2] and the 'head'[3] of purse-tassels; for this too some interweave in their garlands. After these come dropwort violet, and of wild plants, gold-flower,[4] the meadow kind of anemone corn-flag *hyakinthos* (squill), and pretty well all the mountain flowers that are used. The rose comes last of these, and is the first of the spring flowers to come to an end, as it is the first to appear, for its time of blooming is short. So too is that of the rest of the wild plants mentioned, except *hyakinthos*,[5] the wild kind (squill), and also the cultivated (larkspur); this lasts on, and so does the gilliflower, and for a still longer time the wallflower, while the violet, as has been said,[6] blooms throughout the year, if it receives tendance. So too dropwort[7] (for that too is one of the plants valued for their flowers, though it is herbaceous[8] in character) if one pinches off and removes the flower instead of letting it go to seed, and if, further,[9] it has a sunny position. The flower is clustering and white, like that of the wild . . . .[10] These then are, we may say, the plants of spring.

[11] The following belong rather to summer: rose-campion carnation *krinon*[12] (lily) spike-lavender and

[6] 6. 6. 2; *cf. C.P.* 1. 13. 12. [7] *cf.* 6. 6. 11.

[8] *ποώδες*: sense not obvious; *εὐώδες* conj. Dalec. *cf. C.P.* 1. 13. 12. [9] *ἔτι* conj. W.; *ὅτι* UMAld.

[10] *Ut labruscae* G, perhaps a guess: see *οἰνάνθη* in Index.

[11] Plin. 21, 67 and 68.

[12] *κρίνον* Sch. from Athen. *l.c.*; so also Plin, *l.c.*; *κήρινθον* Ald.

ἀμάρακος ὁ Φρύγιος· ἔτι δὲ ὁ πόθος καλούμενος· οὗτος δ' ἐστὶ διττός, ὁ μὲν ἔχων τὸ ἄνθος ὅμοιον τῇ ὑακίνθῳ, ὁ δὲ ἕτερος ἄχρους λευκός, ᾧ χρῶνται περὶ τοὺς τάφους· καὶ χρονιώτερος οὗτος. ἀνθεῖ δὲ καὶ ἡ ἶρις τοῦ θέρους καὶ τὸ στρούθιον καλούμενον· τῇ μὲν ὄψει καλὸν τὸ ἄνθος ἄοσμον δέ. μετοπώρου δὲ τὸ λείριον τὸ ἕτερον καὶ ὁ κρόκος, ὅ τε ὀρεινὸς ἄοσμος καὶ ὁ ἥμερος· εὐθὺς γὰρ ἀνθοῦσι τοῖς πρώτοις ὕδασι. χρῶνται δὲ καὶ τῶν ἀγρίων τῷ τῆς ὀξυακάνθου καρπῷ καὶ τῷ ἄνθει τῷ τῆς μίλακος.

4 Καὶ ταῖς μὲν ὥραις οὕτως ἑκάστων ἡ γένεσις. ὡς δὲ ἁπλῶς εἰπεῖν οὐδεὶς διαλείπεται χρόνος οὐδ' ἔστιν ἀνανθής, ἀλλὰ καὶ ὁ χειμὼν ἔχει καίπερ ἄγονος δοκῶν εἶναι διὰ τὴν κατάψυξιν τῶν μετοπωρινῶν μεταλαμβανόντων, ἐὰν δὲ δὴ καὶ μαλακὸς ᾖ, πολλῷ μᾶλλον. ἁπλῶς γὰρ πάντ' ἢ τὰ πολλὰ καὶ ἐπεκτείνεται τῆς οἰκείας ὥρας, καὶ ἐὰν ὁ τόπος εὔειλος ᾖ μᾶλλον· δι' ὃ καὶ συνέχεια γίνεται. χρονοι μεν οὖν οὗτοι καὶ ὧραι κατὰ τὰς γενέσεις.

5 Βίος δὲ ἰωνιας μεν τῆς λευκῆς ἔτη μάλιστα τρία· γηρασκουσα δὲ ἐλαττοῦται καὶ ἔα λευκότερα φέρει. ῥοδωνιας δὲ πέντε τὰ πρὸς τὴν ἀκμὴν μη ἐπικαομένης· χειρω δὲ καὶ ταύτης τὰ ῥόδα γηρασκούσης. πρὸς εὐοσμίαν δὲ καὶ ῥόδων καὶ ἴων καὶ τῶν ἄλλων ἀνθῶν μέγιστον ὁ τόπος

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[1] *cf. C.P.* 1. 4. 1.

[2] *cf.* the Eng. plant-name 'love-in-absence'; see *πόθος* in Index.

[3] λευκὸς . ἔκλευκος, 'whitish,' Athen. *l.c.*

[4] Evidently the *νάρκισσος ἢ λείριον* of 6. 6. 9 ; *cf.* 6. 8. 1 n.

the Phrygian sweet marjoram[1]; also the plant called 'regret,'[2] of which there are two kinds, one with a flower like that of larkspur, the other not coloured but white,[3] which is used at funerals; and this one lasts longer. The iris also blooms in summer, and the plant called soap-wort, which has a beautiful flower but is scentless. In autumn bloom the other kind of narcissus,[4] the crocus, both the scentless mountain form and the cultivated one (saffron-crocus); for these bloom directly the first rains come. The fruit[5] of the cotoneaster and the flower of the smilax, both of them wild plants, are also used in garlands.

Such are the seasons at which each appears; and, to speak generally, there is no interval of time nor flowerless period, but even winter produces flowers, for all that it seems to be unproductive by reason of the cold, since the autumn flowers continue into winter, and to a much greater extent if the season be mild. For all things,[6] one may say, or at least most of them, extend beyond their proper season, and all the more if the place be sunny; so that there is a continuous succession. These then are the periods and seasons at which the various flowers are produced.

[7] The life of the gilliflower is at most three years; as it ages it degenerates and produces paler flowers.[8] A rose-bush lives five years, after which its prime[9] is past, unless it is pruned by burning[10]; with this plant too the flowers become inferior as it ages. Position and a suitable climate contribute most to

[5] *καρπῷ*: Plin. *l.c.* apparently read *ἄνθει*.
[6] *πάντ' ἢ* conj. St.; *πάντη* Ald. H.
[7] Plin. 21. 69.
[8] *ἅ* conj. St.; *ἀεὶ* Ald.
[9] *ἀκμὴν* conj. Scal.; *ἀκτὴν* Ald.
[10] *cf.* 6. 6. 6.

συμβάλλεται καὶ ὁ ἀὴρ πρὸς ἕκαστον οἰκεῖος· ἐν Αἰγύπτῳ γὰρ τὰ μὲν ἄλλα πάντ' ἄοσμα καὶ ἄνθη καὶ ἀρώματα, αἱ δὲ μυρρίναι θαυμασταὶ τῇ εὐοσμίᾳ. προτερεῖν δέ φασι τῶν ἐνταῦθα καὶ ῥόδα καὶ ἴα καὶ τὰ ἄλλα ἄνθη καὶ διμήνῳ, καὶ διαμένειν πλείω τῶν παρ' ἡμῖν ἢ οὐκ ἐλάττω χρόνον ταῦτα.

6 Δοκεῖ δὲ πολὺ πρὸς εὐοσμίαν διαφέρειν, ὥσπερ ἐλέχθη, καὶ ὁ ἐνιαυτὸς τοῖος ἢ τοῖος γενόμενος, οὐ μόνον ἐπομβρίαις καὶ αὐχμοῖς ἀλλὰ καὶ τῷ κατὰ καιρὸν γίνεσθαι καὶ ὕδατα καὶ πνεύματα καὶ ἁπλῶς τὰς τοῦ ἀέρος μεταβολάς. τὰ δὲ ἐν τοῖς ὄρεσιν ὡς ἁπλῶς εἰπεῖν καὶ ῥόδα καὶ ἴα καὶ τὰ ἄλλα <καλῶς μὲν ἀνθεῖν> τῇ δὲ ὀσμῇ πολλὰ χείρω γίνεσθαι. καὶ περὶ μὲν τῶν στεφανωματικῶν καὶ ἁπλῶς τῶν φρυγανικῶν σχεδὸν ἐν τούτοις καὶ τοῖς ὁμοίοις ἐστὶν ἡ ἱστορία.

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1 ?violets and gilliflowers ; so also below.
2 Plin. *l.c.*; *cf. C.P.* 6. 18. 3.
3 ἄνθη conj. St. from G ; ἀνανθὴ Ald. *cf. C.P.* 6. 19. 4.
4 Plin. 15. 37.

the fragrance of roses gilliflowers[1] and other flowers. Thus in Egypt,[2] while all other flowers[3] and sweet herbs are scentless, the myrtles[4] are marvellously fragrant. In that country it is said that the roses gilliflowers and other flowers are as much as two months ahead of those in our country, and also that they[5] last a longer, or at least not a shorter, time than those of our country.

And, as has been said, the particular season according to its character, makes a great difference to the fragrance, not only by reason of rains and droughts, but also according as rain, wind, and in general, the changes of climate occur or do not occur at the fitting moment. Also it appears that in general roses gilliflowers and the rest bloom well on the mountains, but many of them have there an inferior scent.[6] Concerning coronary plants and under-shrubs in general these examples and others like them suffice for our enquiry.

[5] *ταῦτα* conj. W.; *τούτου* Ald.

[6] *ἄνθη τῇ ὀσμῇ πολλῷ* Ald.; *ἄνθη τῇ δὲ ὀσμῇ πολλὰ* UM, whence Sch. and W. conj. that some such words as *καλῶς μέν* have dropped out and *ἀνθεῖν* has been altered to *ἄνθη*. *cf. C.P.* 6. 20. 1.

BOOK VII

H

I. Ἑπόμενον δὲ τοῖς εἰρημένοις περὶ τῶν ποιῶδῶν εἰπεῖν· τοῦτο γάρ ἐστι λοιπὸν τῶν ἐξ ἀρχῆς διαιρεθέντων γενῶν, ἐν ᾧ συμπεριλαμβάνονταί πως τὸ λαχανηρὸν καὶ τὸ σιτῶδες. καὶ πρῶτον περὶ τοῦ λαχανώδους λεκτέον ἀρξαμένους ἀπὸ τῶν ἡμέρων, ἐπεὶ γνώριμα μᾶλλον τυγχάνει τῶν ἀγρίων.

Εἰσὶ δὴ τρεῖς ἄροτοι πάντων τῶν κηπευομένων, ἐν οἷς ἕκαστα σπείρουσι διαιροῦντες ταῖς ὥραις. εἷς μὲν οὖν ὁ χειμερινός, ἄλλος δὲ ὁ θερινός, τρίτος δὲ ὁ μεταξὺ τούτων μεθ' ἡλίου τροπὰς
2 χειμερινάς. καλοῦσι δ' οὕτως οὐ πρὸς τὴν σπορὰν βλέποντες ἀλλὰ πρὸς τὴν γένεσιν καὶ τὴν χρείαν ἑκάστου· ἐπεὶ ἥ γε σπορὰ σχεδὸν ἐν τοῖς ἐναντίοις γίνεται. τοῦ χειμερινοῦ μὲν γὰρ ἀρχὴ μετὰ τροπὰς θερινὰς τοῦ Μεταγειτνιῶνος μηνός, ἐν ᾧ σπείρουσι ῥάφανον ῥαφανίδα γογγυλίδα καὶ τὰ καλούμενα ἐπίσπορα· ταῦτα δ' ἐστὶ τεύτλιον θριδακίνη εὔζωμον λάπαθον νᾶπυ κορίαννον ἄνηθον κάρδαμον· καλοῦσι δὲ

[1] *cf. C.P.* 3. 20. 7 and 8.

BOOK VII

Of Herbaceous Plants, other than Coronary Plants: Pot-herbs and similar Wild Herbs.

Of the times of sowing and of germination of pot-herbs.

I. Next we have to tell of herbaceous plants: for this class remains of those which we distinguished at the outset, and it includes to some extent the classes of pot-herbs and of cereals. And first we must speak of the class of pot-herbs, beginning with the cultivated kinds, since it happens that these are better known than the wild kinds.

[1] There are three seed-times for all things grown in gardens, at which men sow the various herbs, distinguishing by the season. One is the 'winter' seed-time, another the 'summer,' and the third is that which falls between these, coming after the winter solstice. These terms however are given in regard not to the sowing, but to the growth and use of each kind; for the actual sowing takes place, one might almost say, at the opposite seasons. Thus, the 'winter' period begins after the summer[2] solstice in the month Metageitnion,[3] in which they sow cabbage radish turnip, and what are called 'secondary crops,' that is to say, beet lettuce rocket monk's rhubarb mustard coriander dill cress; and

[2] θερινὰς conj. Scal.; χειμερινὰς U(?)MP$_2$Ald.G (ed. Bas. and Par. but not ed. Tarv.).

[3] July. δὲ before M. om. Sch.

καὶ πρῶτον τοῦτον τῶν ἀρότων. τοῦ δὲ δευτερου πάλιν μεθ' ἡλίου τροπὰς τοῦ Γαμηλιῶνος μηνός, ἐν ᾧ σπείρουσι καὶ πηγνύουσι πράσον σέλινον γήθυον ἀδράφαξυν. τοῦ τρίτου δέ, ὃν καλοῦσι θερινόν, τοῦ Μουνυχιῶνος· ἐν τούτῳ δὲ σπείρεται σίκυος κολοκύντη βλίτον ὄκιμον ἀνδράχνη θύμβρον. ποιοῦνται δὲ πλείους ἀρότους τῶν ὁμοίων καθ' ἑκάστην ὥραν, οἷον ῥαφανίδος ὠκίμου τῶν ἄλλων. πᾶσι δὲ σπείρεται τοῖς ἀρότοις τὰ ἐπίσπορα.

3 Διαφύεται δ' οὐκ ἐν ἴσοις πάντα χρόνοις, ἀλλὰ τὰ μὲν θᾶττον τὰ δὲ βραδύτερον ὅσα δυσφυῆ. τάχιστα μὲν οὖν ὄκιμον καὶ βλίτον καὶ εὔζωμον καὶ τῶν χειμερινῶν ῥαφανίς· τριταῖα γὰρ ὡς εἰπεῖν. θριδακίναι δὲ τεταρταῖαι ἢ πεμπταῖαι. σίκυος δὲ καὶ κολοκύντη περὶ τὰς πέντε ἢ ἕξ, οἱ δέ φασιν ἑπτά· πρότερον δὲ καὶ θᾶττον ὁ σίκυος. ἀνδράχνη δ' ἐν πλείοσι τούτων. ἄνηθον δὲ τεταρταῖον. κάρδαμον δὲ καὶ νᾶπυ πεμπταῖα. τεύτλιον δὲ θέρους μὲν ἑκταῖον χειμῶνος δὲ δεκαταῖον. ἀδράφαξυς δὲ ὀγδοαία. ῥάφανος δὲ δεκαταία. πράσον δὲ καὶ γήθυον οὐκ ἐν ἴσοις, ἀλλὰ τὸ μὲν ἐννεακαιδεκαταῖον ἐνιαχοῦ δὲ εἰκοσταῖον, γήθυον δὲ δεκαταῖον ἢ δωδεκαταῖον. κορίαννον δὲ δυσφυές· οὐδὲ γὰρ ἐθέλει βλαστάνειν τὸ νέον ἐὰν μὴ βρεχθῇ. θύμβρα δὲ καὶ ὀρίγανος ἐν πλείοσιν ἢ τριάκοντα. δυσφυέστατον δὲ πάντων τὸ σέλινον· τεσσαρακοσταῖον γάρ φασιν οἱ τὰ συντομώτερα λέγοντες,

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[1] January. [2] April. [3] Plin. 19. 117.
[4] τῶν χειμερινῶν: *cf.* 7. 1. 1.

this is also called the 'first' period of cultivation. The second period begins after the winter solstice in the month Gamelion,[1] in which they scatter or plant the seed of leeks celery long onion orach. The third period, which is called the 'summer' period, begins in the month Munychion[2]: in this are sown cucumber gourd blite basil purslane savory. Moreover they make several sowings of the same herb at each season, as of radish basil and the others. And at all the periods are sown the 'secondary crops.'

[3] Not all herbs germinate within the same time, but some are quicker, others slower, namely those which germinate with difficulty. The speediest are basil blite rocket, and of those sown for winter[4] use, radish; for these germinate in about three days. Lettuce takes four or five, cucumber and gourd about five or six, or, as some say, seven; however, cucumber is earlier and quicker than the others. Purslane takes a longer time, dill four days, cress and mustard five. Beet in summer takes six days, in winter ten, orach takes eight, and turnip ten. Leek[5] and long onion do not take the same time, but the former nineteen to twenty days, the latter ten to twelve. Coriander germinates with difficulty; indeed fresh seed will not come up at all unless it is moistened.[6] Savory[7] and marjoram take more than thirty days; but celery germinates with the greatest difficulty of all; for those who make the time comparatively short say forty days, and others fifty, and

[5] *πρασον* conj. Bod.; *πράσιον* P_2Ald.II.

[6] *βρεχθῇ* conj. Bod. *cf. C.P.* 4. 3. 1; *ἐλιχθῇ* Ald.; *ἐλιχθῇ* P_2Bas.; so also G.

[7] *cf. C.P.* 4. 3. 1; Plin. 19. 7.

οἱ δὲ πεντηκοσταῖον, καὶ τοῦτο κατὰ πάντας τοὺς ἀρότους· ἐπισπείρουσι γάρ τινες ἐπὶ πᾶσιν.

4 Ὅλως δὲ ὅσα κατὰ πλείους ὥρας σπείρεται, ταῦτ' οὐδὲν θᾶττον τέλεια γίνεται τοῦ θέρους. καὶ θαυμαστὸν εἰ καὶ μηθὲν ἡ ὥρα συμβάλλεται καὶ ὁ ἀὴρ πρὸς τὸ θᾶττον, ἐὰν δὲ μοχθηρὰ καὶ ψυχρὰ καὶ τῷ ἀέρι περισκεπὴς βραδύτερον· ἐπεὶ καὶ χειμώνων ἢ εὐδιῶν ἐπιγινομένων τοῖς ἀρότοις ὁτὲ μὲν βραδύτερον ὁτὲ δὲ θᾶττον ἡ βλάστησις· διαφέρει δὲ ταῦτα κατὰ τοὺς ἀρότους ἑκάστων· πρωϊαίτατον γὰρ ἐν τοῖς εὐείλοις καὶ εὐκρᾶσιν.

5 Ὡς γὰρ ἁπλῶς εἰπεῖν ἐν πλείοσι δεῖ τὰς αἰτίας ὑπολαβεῖν τῶν τοιούτων, ἔν τε τοῖς σπέρμασιν αὐτοῖς καὶ ἐν τῇ χώρᾳ καὶ τῷ ἀέρι καὶ ταῖς ὥραις αἷς ἕκαστα σπείρουσι καὶ χειμώνων καὶ εὐδιῶν. ἀλλὰ τοῦτο μὲν σκεπτέον, ἐφ' ὧν τε παραλλάττουσιν οἱ χρόνοι καὶ ἐφ' ὧν οὔ· καὶ γὰρ τὴν ῥαφανίδα φασί τινες τριταίαν καὶ θέρους καὶ χειμῶνος, τὸ δὲ τεύτλιον, ὥσπερ εἴρηται, παραλλάττει κατὰ τὰς ὥρας. χρόνοι δ' οὖν οὗτοι τῆς βλαστήσεώς εἰσι καὶ λέγονται καθ' ἕκαστον.

6 Διαφέρει δὲ πρὸς τὸ θᾶττον καὶ βραδύτερον καὶ ἡ τῶν σπερμάτων παλαιότης. τὰ μὲν γὰρ ἀπὸ νέων παραγίνεται θᾶττον, οἷον πράσον γήθυον

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[1] ὥρας Vo.H.; χώρας UM; so also G.

[2] τέλεια conj. W. (comm.); γε πολλὰ MSS.; τὰ πολλὰ Vo.Sch.W. (text); γίνεται conj. Sch. from G; γίνεσθαι Ald.

[3] καὶ τῇ ἀέρι . . . βραδύτερον: grammar doubtful and text perhaps defective: so given in UM; καὶ ὁ ἀὴρ περισκεπὴς

that too, at whichever period it is sown, for some sow it as a 'secondary crop' at all the periods.

Generally speaking, those herbs which are sown at more than one season[1] do not mature[2] faster in the summer. Howbeit it is strange if the season and the state of the atmosphere do not contribute at all to quicker growth, and if, when there is an unfavourable cold season and the atmosphere is cloudy, these conditions do not tend to make growth slower,[3] seeing that, when stormy or fair weather follows the sowing, germination is slower or quicker accordingly. And there is another thing which makes a difference as to the raising of the various herbs; germination begins earlier in sunny places which have an even temperature.

As a matter of fact, to speak roundly, the causes of such differences must be found in several different circumstances, in the seeds themselves, in the ground, in the state of the atmosphere, and in the season at which each is sown, according as it is stormy or fair. However it is a point for consideration with which herbs the time of sowing makes a difference and with which it makes none; thus it is said that radish germinates on the third day whether it be sown in summer or in winter, while beet, as has been said, behaves differently according to the season. Anyway such are and are said to be the seasons of germination in each case.

[4]Another thing which makes a difference as to the rapidity with which the seeds germinate is their age; for some herbs come up quicker from fresh seed, as

πρὸς τὸ βραδύτερον conj. Sch. (with μοχθ. κ. ψυχρὰ supply ἡ ὥρα ἦ).

[4] Plin. 19. 118. δὲ conj. Scal.; γὰρ Ald.H.

σίκυος κολοκυντη· ἔνιοι δὲ καὶ προβρέχουσι τὸν σίκυον πρὸς τὸ θᾶττον ἢ ἐν γάλακτι ἢ ἐν ὕδατι. τὰ δ' ἀπὸ παλαιῶν, οἷον σέλινον τεύτλιον κάρδαμον θύμβρα κορίαννον ὀρίγανον· εἴπερ μὴ <φυτεύεται> αὐτὰ ἀπὸ τοῦ νέου, καθάπερ εἴπομεν. ἴδιον δέ φασιν ἐπὶ τοῦ τευτλίου συμβαίνειν· οὐ γὰρ διαφύεσθαι πᾶν εὐθὺς ἀλλ' ὕστερον πολλῷ, τὸ δὲ καὶ τῷ ἐχομένῳ ἔτει καὶ τῷ τρίτῳ, δι' ὃ καὶ ἐκ πολλοῦ σπέρματος ὀλίγον βλαστάνειν.

7 Ἕκαστον δὲ τῶν σπερμάτων, ἐὰν ἀδρυνθέντα ἀποπέσῃ, διαμένει πρὸς τὴν ὥραν τὴν ἑαυτοῦ καὶ οὐ πρότερον ἐκβλαστάνει· καὶ κατὰ λόγον ἐστί· καὶ γὰρ ἐπὶ τῶν ἀγρίων ὁρῶμεν συμβαῖνον, ἐὰν μὴ φθαρῇ. αἱ δὲ τελειώσεις τῶν καρπῶν ἁπάντων γίνονται τοῦ θέρους, πρότερον δὲ καὶ θᾶττον ὡς ἁπλῶς εἰπεῖν τῶν πρότερον σπαρέντων. διαφέρει δὲ καὶ ἡ ὥρα· τὰ γὰρ ἐν ταῖς θερμημερίαις σπαρέντα θᾶττον ἐκκαυλεῖ καὶ ἐκσπερματοῦται, καθάπερ ῥαφανὶς γογγυλίς. ἔνια δὲ οὐκ ἐνιαύσια φέρει τὸν καρπὸν ἀλλὰ δίενα, καθάπερ σέλινον πράσον γήθυον, ἃ καὶ διαμένει χρόνον πλείονα καὶ οὐκ ἔστιν ἐπέτεια· τὰ γὰρ πολλὰ τούτων ἅμα τῇ τελειώσει τῶν σπερμάτων αὐαίνεται.

8 Πάντα δὲ ὡς εἰπεῖν ὅσα ἐκκαυλεῖ καὶ τελειοῖ τὸν καρπὸν ἀποτελειοῦται κατὰ τὸ σχῆμα τοῦ παραβλαστήσεις ἐκ τῶν καυλῶν ἔχειν ἀκρεμονικάς, πλὴν ὅσα μονόκαυλα, καθάπερ πράσον καὶ γήθυον καὶ κρόμυον καὶ σκόροδον.

Φίλυδρα δὲ καὶ φιλόκοπρα πάντα, μᾶλλον δὲ

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[1] φυτεύεται αὐτὰ conj. W.; οὐ τὸ UMAld.
[2] Sc. soaking.

leek long onion cucumber gourd; (some even soak the seed of cucumber first in milk or water, to make it germinate quicker). Some come up quicker from old seed, as celery beet cress savory coriander marjoram (unless indeed they are raised[1] from fresh seed in the manner[2] which we have mentioned). There is, they say, a singular feature about beet[3]; the seed does not all germinate at once, but some of it not for some time, some even in the next or in the third year; wherefore it is said that little comes up from much seed.

Any of the seeds, if they are ripe when they fall, last till their own proper season and do not sprout till then. And in this they are consistent; for we note that the same thing happens with the seed of wild plants, unless it is destroyed. However all mature their fruits in the summer, though sooner and quicker, generally speaking, when they are sown earlier. The season also[4] makes a difference; things sown in the hot season push up their shoots and go to seed sooner, as radish and turnip. Some however bear their fruit not in the same year but in the next, as celery[5] leek long onion, which plants also last a longer time, and are not annual; for most herbs wither with the ripening of their seed.

Generally speaking, all those that push up shoots and mature their fruit reach their perfection of form in having side-shoots branching from the main stem —except those which have but a single stem, as leek long onion onion garlic.

All these herbs are lovers of water and of dung,

[3] *cf. C.P.* 4. 3. 2; Plin. *l.c.*
[4] δὲ conj. W.; γὰρ Ald.H.
[5] Plin. *l.c.*

τὰ ἀσθενέστερα καὶ πλείονος ἐπιμελείας δεόμενα, τὰ δὲ καὶ τροφῆς.

II. Φύεται δὲ πάντα ἀπὸ τοῦ σπέρματος, ἔνια δὲ καὶ ἀπὸ παρασπάδος καὶ κλωνὸς καὶ ῥίζης. ἀπὸ μὲν παρασπάδος ἡ ῥάφανος· δεῖ γάρ τι καὶ ῥιζῶδες προσλαβεῖν. ἀπὸ δὲ τῶν βλαστῶν πήγανον ὀρίγανος ὄκιμον· ἀποφυτεύουσι γὰρ καὶ τοῦτο ὅταν σπιθαμιαῖον ἢ μεῖζον γένηται τεμόντες εἰς τὸ ἥμισυ. ἀπὸ ῥίζης δὲ σκόροδον καὶ κρόμυον καὶ βολβὸς καὶ ἄρον καὶ ἁπλῶς τὰ τοιαῦτα τῶν κεφαλορρίζων. φύεται δὲ καὶ εἴ τινων αἱ ῥίζαι διαμένουσιν ἐπὶ πλείονα χρόνον ἐπετειοκαύλων ὄντων. ὅτι δὲ ἀπὸ σπέρματος πάντα βλαστάνει φανερόν· καὶ γὰρ τὸ πήγανον, ὅπερ οὔ φασί τινες, ἀλλὰ βραδέως, δι' ὃ καὶ ἀποφυτεύουσιν.

2 Ὅσα δὲ ἀπὸ ῥίζης φύεται, τούτων ἡ μὲν ῥίζα χρόνιος αὐτὰ δὲ ἐπετειόκαυλα, δι' ὃ καὶ παραβλαστάνουσιν αἱ ῥίζαι τῶν τοιούτων καὶ γίνονται πλείους οὐ μόνον ἐν τοῖς ἡμέροις καὶ κηπευομένοις ἀλλὰ καὶ ἐν τοῖς ἀγρίοις, ὥσπερ εἴπομεν, οἷον βολβοῖς γηθύοις σκίλλαις καὶ τοῖς ἄλλοις. παραβλαστάνει δ' ἔνια καὶ τῶν μὴ κεφαλορρίζων χρονιωτέρων δέ, οἷον σέλινον καὶ τεύτλιον· ἀφιᾶσι γὰρ ῥίζας ἀφ' ὧν φύονται φύλλα καὶ καυλοί.

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[1] Plin. 19. 121. [2] *cf. C.P.* 1. 4. 2.

[3] δεῖ γάρ τι UP_2; ἀεὶ γάρ τι Ald.H.G; Sch. suggests δὲ for γὰρ, missing the sense.

[4] βλαστῶν corresponds to κλωνὸς above.

and especially the weaker ones, which require more attention or in some cases more feeding.

Of the propagation of pot-herbs, and of differences in their roots.

II. [1]All these herbs are propagated from seed, and some also by a piece torn off, a shoot, or a piece of root. Cabbage is propagated by a piece torn off,[2] since it is essential [3] in this case to take a piece which has root attached to it. From cuttings [4] are grown rue marjoram basil; for slips of this too men plant when it has grown to the height of a span or more, cutting off half the plant.[5] By root[6] are planted garlic onion purse-tassels cuckoo-pint and in general such bulbous plants. Such propagation is also possible in cases where the roots persist for more than a year, though the shoots last but for a year. And it is plain that all these herbs can be grown from seed; for even rue can (which some deny), though the process is slow, and so cuttings are also taken.

Of those which are propagated by a piece of root the root is long-lived, though the plant itself may be annual; wherefore the roots of such plants make offsets and so increase; and this is true not only of plants cultivated in the garden, but also of wild plants, as we have said, for instance of purse-tassels long onion [7] squill and so forth. Some plants even which are not bulbous [8] but longer-lived make offsets, as celery and beet; for these send out roots from which grow leaves and stems. Long onion and

[5] *cf. C.P.* 1. 4. 3. [6] *i.e.* offsets.
[7] γηθύοις om. some editors, as not being wild.
[8] *i.e.* and so annual.

παραβλαστάνει δὲ καὶ γήθυον καὶ πράσον καὶ παραφύει κάτωθεν οἷον βολβώδη τινὰ κεφαλήν, ἐξ ἧς ἡ βλάστησις γίνεται τῶν φύλλων, αὐανθέντος δὲ τοῦ καυλοῦ καὶ τοῦ σπέρματος ἀφαιρεθέντος· ἀλλὰ διὰ τὸ μὴ χρησίμας εἶναι τὰς τούτων κεφαλὰς οὐ συλλέγουσιν εἰς ξηρασίαν, δι'
3 ὃ καὶ οὐ φυτεύουσι. τάχα δὲ ταῦτα καὶ ὁμογενῆ καὶ σύνεγγύς πως τῇ τοῦ κρομύου φύσει, δι' ὃ καὶ οὐ θαυμαστόν. ἀλλ' ὁμοίως [καὶ] ἐπὶ πάντων καὶ ἡμέρων καὶ ἀγρίων, ὅσα χρονιώτερα μέν ἐστιν ἐπετειόκαυλα δέ, τούτων καὶ αἱ ῥίζαι ἐπιβλαστάνουσιν, ὥσπερ καὶ ἐπὶ τῶν φρυγανικῶν καὶ τῶν θαμνωδῶν· ἀλλ' ἐπὶ τῶν κρομύων καὶ σκορόδων καὶ βολβῶν καὶ ὥσπερ ἀριθμός τις γίνεται τούτων. ἡ δὴ γένεσις, ὥσπερ εἴρηται, τριχῶς ἐστιν, ἀπὸ σπέρματος μὲν πάντων, ἀπὸ δὲ καυλοῦ καὶ ῥίζης τῶν εἰρημένων.

4 Τῶν δὲ καυλῶν κολουσθέντων πάντα μὲν ὡς εἰπεῖν βλαστάνει πλὴν τῶν ἀποκαύλων, ἐμφανέστατα δ' ὥσπερ καὶ εἰς χρείαν ὤκιμον θρῖδαξ ῥάφανος. καὶ τῆς μὲν θρίδακος ἡδίους φασὶ τοὺς παλιμβλαστεῖς εἶναι καυλούς· τὸν γὰρ πρῶτον ὀπώδη καὶ πικρὸν εἶναι ὡς ἄπεπτον· οἱ δὲ τὸ ἐναντίον ὀπωδεστέρους τούτους ἀλλ' ἕως ἂν ὦσιν ἁπαλοὶ φαίνεσθαι γλυκυτέρους. ἀλλ' ἐπὶ τῆς

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[1] πράσον conj. St.; πράσιον Ald.H.
[2] διὰ τὸ μὴ conj. W.; μὴ διὰ τὸ UM(?)Ald.
[3] *i.e.* offset bulbs.
[4] W. omits μὲν (Ald.UM(?)) after συλλέγουσι.
[6] *i.e.* the plant is increased by seed only and not by offsets. *cf.* 7. 4. 10; Plin. 19. 103.
[6] ὁμοίως conj. Sch.; ὅμως PAld.H.(UM ?).
[7] ἐπετειόκαυλα conj. Sch.; ἐπιγειότερα PAld.H.

leek[1] also make offsets, sending out a 'head' below, like the bulb of purse-tassels, from which the leaves spring; but this only takes place when the stem has withered and the seed has been removed. But, as[2] the 'heads'[3] of such plants are not useful, they do not collect them[4] for storing dry; wherefore also they do not plant these.[5] It may be that somehow these are akin and closely allied to onion, wherefore what has been said is not surprising. However in all those plants, both wild and cultivated alike,[6] which have an annual stem,[7] but yet live longer than a year, there is an outgrowth of the roots, just as there is in under-shrubs and shrubby plants: while in onions garlic and purse-tassels even a number,[8] as it were, of such roots is formed. In fact,[9] they are reproduced in three ways, as has been said; from seed in all cases and from the stem[10] and root in those specified.

[11] Almost all shoot again if the stem is broken (except those which are stemless), but most obviously basil lettuce cabbage, which are, as it were, broken for a practical reason. Indeed they say that the stems of lettuce which thus grow again are sweeter,[12] for that the original stem has a taste like fig-juice and is bitter, as being not properly ripened. Some however say that the later stems have the taste of fig-juice more than the original one, but that, so long as they are tender, they appear sweeter. Be that as

[8] *ἀριθμὸς* is clearly corrupt, and has displaced an unusual word for which *ὥσπερ* apologises.

[9] *δὴ* conj. Sch.; *δὲ* Ald.

[10] *καυλοῦ* is here that part of the plant which is above ground. [11] Plin. 19. 122.

[12] *ἡδίους* Vo.mBas.H., so too G, Plin. *l.c.*, Athen. 2. 69; *ἰδίους* UAld. *cf. C.P.* 2. 15. 6.

ραφάνου τοῦτο ὁμολογούμενον, ὡς εἰ πάλιν βλαστήσειεν ἡδίων ἀφαιρεθέντων γε τῶν φύλλων πρὸ τοῦ διακαυλίσαι.

5 Διαμένουσι δὲ αἱ ῥίζαι πλειόνων, ἀλλ' αἱ μὲν βλαστάνουσι πάλιν αἱ δὲ οὔ. ραφανὶς γοῦν καὶ γογγυλὶς διαμένουσι γῆς ἐπιβληθείσης ἄχρι θέρους καὶ αὔξησιν λαμβάνουσιν, ὅπερ ποιοῦσί τινες ἐξεπίτηδες τῶν κηπουρῶν· οὐ βλαστάνουσι δὲ οὐδ' ἀφιᾶσι φύλλον οὐδ' εἴ τις ἀφέλοι τὴν ἐπισεσαγμένην γῆν. ἰδεῖν δὲ τοῦτο καὶ ἐπὶ τῶν ἄλλων ἐστί. τὰ δὲ πλεῖστα τῶν λαχάνων μονόρριζα τῇ παχείᾳ κατὰ βάθους ῥίζῃ· καὶ γὰρ ὅσα παραφύει τὰς ἰσοπαχεῖς ταύτας, ὥσπερ σέλινον καὶ τεύτλιον, ἀπὸ τῆς μέσης πως ἡ παράφυσίς ἐστι καὶ οὐκ εὐθὺς ἀπὸ τῆς ἀρχῆς ἡ σχίσις· ἐκ δὲ ταύτης τῆς μιᾶς ἀπήρτηνται αἱ ἀποφυάδες αἱ μικραὶ καὶ τῆς ραφανίδος καὶ τῆς γογγυλίδος. καὶ αὗται μὲν δὴ πᾶσι φανεραὶ διὰ τὴν χρείαν.

6 Ἡ δὲ τοῦ τευτλίου μία μὲν μακρὰ καὶ παχεῖα καὶ ὀρθή, καθάπερ ἡ τῶν ραφανίδων, ἀποφύσεις δὲ ἔχει παχείας ὁτὲ μὲν δύο ὁτὲ δὲ καὶ τρεῖς ὁτὲ δὲ καὶ μίαν, τὰς δὲ μικρὰς ἐκ τούτων. σαρκώδης δὲ ἡ ῥίζα καὶ τῇ γεύσει γλυκεῖα καὶ ἡδεῖα, δι' ὃ καὶ ὠμὴν ἐσθίουσί τινες· ὁ δὲ φλοιὸς οὐ παχὺς οὐδὲ ἀφαιρετός, ὥσπερ ὁ τῶν ραφανίδων, ἀλλὰ μᾶλλον οἷος ὁ τῶν ἱπποσελίνων. ὡσαύτως δὲ καὶ ἡ τῆς ἀδραφάξυος μία μὲν εἰς βάθος ἐκ ταύτης δὲ ἄλλαι.

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[1] βλαστήσειεν conj. Sch.; βλαστήσει Ald.
[2] οὐδ' εἴ τις Ald.H.; εἰ μή τις conj. Scal. supported by G.
[3] ἐκ . . . μικραὶ conj. W.; εἰς δὲ ταύτην τὴν μίαν ἡ ἀπ' αὐτῆς

it may, it is admitted that in the case of cabbage the stem is sweeter if it should have grown[1] again after being broken, provided that the leaves are stripped off before the plant runs to stalk.

In most cases the roots persist, but they do not in all cases produce fresh growth. Thus radish and turnip persist till summer, if earth is thrown on them, and they increase in size; and some gardeners do this deliberately; but they do not make fresh growth nor send out leaves, even if one[2] removes the earth heaped over them. And this may also be observed in other plants. However, most pot-herbs have the single stout root which runs deep; for even in those which produce these side-roots of equal stoutness, as celery and beet, the side-growth comes, as it were, from the middle root and it is not separate to start with; but to this single root are attached the small out-growths,[3] both in radish and in turnip. These instances are familiar to all because of the use[4] which is made of these plants.

The beet has a single long stout straight root like that of the radish, and has stout out-growths, sometimes two, sometimes three, sometimes only one, and the small ones are attached to these. The root is fleshy and sweet and pleasant to the taste, wherefore some even eat it raw. The 'bark' is not thick and cannot be detached, like that of the radish, but rather resembles that of alexanders. In like manner the root of orach is single and runs deep, and other roots are attached to it.

τε καὶ τῆς ἀποφυάδος καὶ μικρὰ Ald.H.; so also M, omitting τε. W.'s restoration of a very corrupt text is at least consistent with what follows in § 6.

[4] *i.e.* for food.

7 Μονορριζότατον δὲ τούτων πάντων τὸ λάπαθον· οὐ γὰρ ἔχει παχείας ἀποφύσεις ἀλλὰ τὰς λεπτάς· βαθυρριζότατον δὲ πάντων, ἔχει γὰρ μείζω τριῶν ἡμιποδίων· τὸ δ' ἄγριον βραχυτέραν, πολύκαυλον δὲ καὶ πολύκλαδον καὶ ἡ ὅλη μορφὴ τελειωθεῖσα παραπλησία τῇ τοῦ τευτλίου· πολυχρονιώτερον δὲ καὶ τοῦ ἀγρίου καὶ ὅλως δὲ πάντων τῶν λαχάνων ὡς εἰπεῖν· διαμένει γὰρ ὁποσονοῦν χρόνον ὥς φασιν. ἔχει δὲ σαρκώδη τὴν ῥίζαν καὶ ἔνικμον, δι' ὃ καὶ ἐξαιρεθεῖσα ζῇ πολὺν χρόνον.

Τὸ δ' ὄκιμον μίαν μὲν τὴν παχεῖαν τὴν κατα βάθους τὰς δ' ἄλλας τὰς ἐκ πλαγίου λεπτὰς ἐπιεικῶς εὐμήκεις.

Ἔνια δ' οὐκ ἔχει τὴν μίαν τὴν ὀρθήν, οἷον τὸ βλίτον, ἀλλ' εὐθὺ πολλὰς ἐξ ἄκρου καὶ εὐπαχεῖς καὶ μακροτέρας τῆς ἀδραφάξυος.

8 Τῶν δὲ ῥιζῶν ξυλωδέσταται πασῶν αἱ τοῦ ὠκίμου, καθάπερ καὶ ὁ καυλός. ἡ γὰρ τοῦ βλίτου καὶ τῆς ἀδραφάξυος καὶ τῶν τοιούτων ἧττον ξυλώδης. εἰσὶ γὰρ ὡς ἁπλῶς εἰπεῖν πασῶν αἱ μὲν σαρκώδεις αἱ δὲ ξυλώδεις. <σαρκώδεις>, οἷον ἡ τοῦ τευτλίου καὶ τοῦ σελίνου καὶ ἱπποσελίνου καὶ λαπάθου καὶ ῥαφανίδος καὶ γογγυλίδος καὶ πάντων μάλιστα τῶν κεφαλοβαρῶν· οὐδὲ γὰρ ἀναξηραινόμεναι σκληρύνονται τελείως. ξυλώδεις δέ,

[1] *cf.* 1. 6. 6.
[2] τὰς Ald., *cf.* τὰς δὲ μικρὰς § 6 ; τινας conj. W. *cf.* Plin. 19. 98 (who mistranslates).
[3] *cf.* 7. 6. 1 ; *C.P.* 3. 1. 4. [4] See Index.

Monk's rhubarb[1] however has a single root in a truer sense than any of the others, for it has no stout out-growths of root, but only the[2] slender ones; its root also runs deeper than that of the others, being more than a foot and a half long. The wild sort[3] however has a shorter root, and has several stems and branches, and its shape, as a whole, when fully grown resembles that of beet. Cultivated monk's rhubarb moreover is longer lived than the wild form,[4] and, in general, we may say, than any other pot-herb, for, they say, it may live any time. It has a fleshy root,[5] full of moisture, wherefore, if pulled up, it will live some time.

Basil has the single stout root, the one which runs deep, and the others at the sides are slender and fairly long.

Some herbs, as blite, have not the single straight root, but a number of roots which start directly from the top and are of a good stoutness[6] and longer than those of orach.

The roots of basil are woodier than those of any of the other herbs, as also is its stem; for those of blite orach and the like are less woody. In general we may say that the roots of any[7] of these herbs are either woody or fleshy. Examples of fleshy[8] roots are beet celery alexanders monk's rhubarb radish turnip, and especially all 'heavy-headed'[9] kinds, for the roots of these do not wither up altogether even when they are dried. Examples of those with woody roots

[5] *βίζαν* conj. Sch.; *σάρκα* Ald.

[6] Plin. *l.c.* seems to have read a different word from *εὐπαχεῖς*, or to have misunderstood it.

[7] *πασῶν* conj. W.; *παρ' ὧν* UMP; also Ald.H., omitting *αἱ*.

[8] *σαρκώδεις* add. Scal. from G.

[9] *i.e.* bulbous; *cf.* 1. 6. 8.

ὥσπερ αἱ τοῦ ὠκίμου καὶ βλίτου καὶ ἀδραφάξυος καὶ εὐζώμου καὶ ἀνήθου [καὶ λαπάθου] καὶ κοριάννου καὶ ἁπλῶς τῶν νευροκαύλων· ἔχει γὰρ δὴ καὶ τὸ ἄνηθον καὶ τὸ κορίαννον ὄντα μονόρριζα ξυλώδη τε τὴν ῥίζαν καὶ οὐ μακρὰν οὐδὲ τὰς λεπτὰς ἀποφυάδας ἔχουσαν πολλάς· πολύκαυλα δὲ ἄμφω καὶ πολύοζα, δι' ὃ καὶ οὐ κατὰ λόγον οὐδενὶ τούτων τὸ ἄνω πρὸς τὸ κάτω.

9 Βραχύρριζα δὲ ταῦτά ἐστιν, οἷον θρῖδαξ ἀνδράχνη, τῇ ὀρθῇ καὶ ταῖς εἰς τὰ πλάγια. ἡ δὲ θρῖδαξ, ὥσπερ οὐκ ἔχει τὰς τοιαύτας ἀποφύσεις ἀλλὰ μόνον τὰς λεπτάς, καὶ μάλιστα δὴ μονόρριζον ὡς εἰπεῖν. ἁπλῶς δὴ πάντα τὰ θερινὰ βραχύρριζα· καὶ γὰρ ὁ σίκυος καὶ ἡ κολοκύντη καὶ ἡ σικύα καὶ διὰ τὴν ὥραν καὶ ἴσως ἔτι μᾶλλον διὰ τὴν φύσιν, ἥπερ συνηκολούθηκε τῇ ὥρᾳ. ἡ δὲ μεταφυτευομένη θρῖδαξ βραχυτέραν ἔχει τὴν ῥίζαν τῆς σπαρείσης· παραβλαστάνει γὰρ ἐκ τῶν πλαγίων μᾶλλον· βραχυτέραν δὲ καὶ ἡ ἀγρία τῆς ἡμέρου, καὶ ἐκ τῶν ἄνωθεν πολυκαυλοτερα.

III. Ἀνθεῖ δὲ τῶν μὲν ἄλλων ἕκαστον ἀθρόον, τὸ δὲ ὤκιμον κατὰ μέρος, τὰ κάτω πρῶτον εἶτ' ὅταν ταῦτα ἀπανθήσῃ τὰ ἄνω, δι' ὃ καὶ πολυ-

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[1] After ἀνήθου Ald.H. have καὶ λαπάθου: bracketed by W. after Sch.

[2] ἀποφυάδας conj. Scal.; ἀποφυλλάδας Ald.

[3] ταῦτα conj. Sch.; τὰ τοιαῦτα UM; τοιαῦτα Ald.

[4] Athen. 2. 79. Sch suggests that the name of a plant has dropped out after ὥσπερ: ? ἡ ἀνδράχνη.

are basil blite orach rocket dill[1] coriander, and in general, those with fibrous stems; for in dill and coriander, which have a single root, the root is woody and not long, and the slender side-roots[2] from it are not numerous; but both plants have several stems and branches; wherefore in neither of these plants does the part above ground correspond to the part which is below.

The following[3] have short roots: lettuce and purslane, in which both the straight main root and the side ones are short. [4] Lettuce may be said to have no such side-roots, but only the slender ones, and may be called in the strictest sense a plant of a single root. In general all summer herbs have short roots: we may include cucumber gourd and bottle-gourd, both because of the season to which they belong and perhaps still more because of their character, which corresponds to the season. However the transplanted lettuce has a shorter root than one that is raised from seed, since it is more apt to send out side-growths; also the wild kind has a shorter[5] root than the cultivated, and the part above ground has more stems.[6]

Of the flowers and fruits of pot-herbs.

III. [7]All, except one, of these herbs produce all their bloom at once, but basil has a succession of flowers, the lower part of the plant flowering first, and then, when that bloom is over, the upper part. Wherefore its season of bloom is a long one, like that of the

[5] *βραχυτέραν* conj. Sch.; *βραχυτέρα* Ald.

[6] *ἄνωθεν πολυκαυλοστέρα* conj. Sch. from G; *ἄνω· τὰ δὲ πολυκ.* Ald. *cf.* Diosc. 2. 136.

[7] Plin. 19. 100.

χρόνιον ἐν τῷ ἀνθεῖν, καθάπερ κύαμος καὶ τῆς πόας τὸ ἡλιοτρόπιον καλούμενον καὶ ἄλλα δὲ τῶν ἀγρίων. ἀνθεῖ δὲ καὶ ὁ σίκυος πολὺν χρόνον· καὶ γὰρ ἐπιβλαστάνειν τούτῳ γε συμβαίνει. τὰ δὲ ἄνθη τῶν μὲν ἔκλευκα τῶν δὲ μηλινοειδῆ τῶν δὲ μικρὸν ἐπιπορφυρίζοντα, εὔχρουν δ' οὐθέν.

2 Τὰ δὲ σπέρματα διαφέρει καὶ τοῖς σχήμασι· τὰ μὲν γὰρ πλεῖστα στρογγύλα τὰ δὲ προμήκη τὰ δ' αὖ πλατέα καὶ φυλλώδη, καθάπερ τὰ τῆς ἀδραφάξυος· ὅμοιον γὰρ τῷ τοῦ σιλφίου· τὰ δὲ στενὰ καὶ γραμμώδη, καθάπερ τοῦ κυμίνου. καὶ τοῖς χρώμασιν ὁμοίως, τὰ μὲν μέλανα τὰ δὲ ξυλώδη τὰ δὲ λευκότερα. πάντα δὴ ἐλλοβοσπέρματα ἢ γυμνοσπέρματα ἢ ἐμφλοιοσπέρματα ἢ παπποσπέρματα· ῥαφανὶς μὲν γὰρ καὶ νᾶπυ καὶ γογγυλὶς ἐλλοβοσπέρματα, κορίαννον δὲ καὶ μάραθον καὶ ἄνηθον καὶ κύμινον γυμνοσπέρματα, βλίτον δὲ καὶ τεύτλιον καὶ ἀδράφαξυς καὶ ὤκιμον ἐμφλοιοσπέρματα, θριδακίνη δὲ παπποσπέρματον.

3 Πάντα δὲ πολύκαρπα καὶ πολυβλαστῆ, πολυκαρπότατον δὲ τὸ κύμινον· ἴδιον δὲ καὶ ὃ λέγουσι κατὰ τούτου· φασὶ γὰρ δεῖν καταρᾶσθαί τε καὶ βλασφημεῖν σπείροντας, εἰ μέλλει καλὸν ἔσεσθαι καὶ πολύ.

Δυσξήραντα δὲ πάντα μὲν ὡς εἰπεῖν πλὴν τοῦ κυμίνου, οὐχ ὡς ὁ σῖτος· οὗτος γὰρ κἂν ἅπαξ

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[1] For the collective sense of πόα (=τὰ ποώδη) *cf* 1. 3. 1.
[2] πολὺν χρόνον conj. W., which at least gives the required sense ; καλούμενος Ald.
[3] μηλινοειδὲς : *cf*. 6. 2. 8.
[4] ? 'orange.' [5] Plin. 19. 119.

bean, and among herbaceous plants [1] that of the plant called *heliotropion*, and also other wild plants. Cucumber also has a long period [2] of bloom, for this plant has a second growth. The flowers are in some cases whitish, in others quince-yellow,[3] in others somewhat reddish [4]; but the flower is never of a bright colour.

[5] The seeds too differ in shape; most are round, but some are oblong; some again are broad and leaf-like, as those of orach, for the seed of this is like that of silphium; others again are narrow or marked in lines,[6] as those of cummin. They also vary in colour, some being black, some the colour of wood,[7] some paler. The seeds of all are either in pods or naked, or have an integument or have a pappus. Radish mustard and turnip have their seeds in pods; coriander fennel dill and cummin have naked seeds; those of blite beet orach and basil are enclosed in an integument; those of lettuce have a pappus on them.

All have numerous fruits and numerous shoots, but cummin has the most [8] fruits of all. [9] And there is another peculiarity told of this plant: they say that one must curse and abuse it, while sowing, if the crop is to be fair and abundant.

Nearly all of these, except cummin, are hard to dry for keeping,—unlike corn [10]; for this, when once

[6] *γραμμώδη*: *cf* 4. 12. 2.; *canaliculata* Plin. *l.c.*

[7] ? 'brown' *cf.* 7 9. 3.

[8] *cf.* 8. 3. 5; *C P.* 4. 15. 2.

[9] *cf* 9. 8. 8; Plin. *l.c.* applies this to *ἄκιμον*, Pall. 4. 9. 5 to *πήγανον*.

[10] *σῖτος· οὗτος γὰρ* I conj.; *σῖτος γάρ* UMH.; P omits *γὰρ*; *σῖτος ὃς* W. after Sch.; *nec modo frumenti consistunt, quod* G.

ἀδρυνθῇ ταχὺ ξηραίνεται καὶ ἀποπίπτει· δυσ-
ξηραντότερα δὲ τὰ ἐμφλοιοσπέρματα καὶ τούτων
4 <μάλιστα τὸ ὤκιμον. ἅπαντα δὲ ξηρανθέντα
πολυκαρπότερα γίνεται, δι' ὃ> καὶ προαφαι-
ροῦντες αὐτὰ ξηραίνουσιν. ἅπαντα δὲ πολύχοα
καὶ πολυσπέρματα, πολυκαρπότατον δὲ τὸ
ὤκιμον.

Ἔστι δὲ τὰ μὲν ἀκρόκαρπα, καθάπερ ὤκιμον
πράσον κρόμυον· τὰ δὲ πλαγιόκαρπα μᾶλλον,
οἷον ῥαφανὶς γογγυλὶς καὶ τὰ τοιαῦτα· τὰ δ'
ἀμφοτέρως, οἷον βλίτον ἀδράφαξυς· ἀμφότερα
γὰρ ταῦτα καὶ ἐκ τοῦ πλαγίου, καὶ τό γε βλίτον
εὐθὺς παρ' ἕκαστον ὄζον προσκαθήμενον ἔχει τὸ
σπέρμα βοτρυῶδες. τὰ δ' ἐκ παλαιοτέρων σπερ-
μάτων θᾶττον ἐκκαυλεῖ, τάχιστα δὲ τὰ ἐκ τῶν
ἀκμαζόντων· ἔστι γάρ τις ἀκμὴ καὶ τούτων. ἀνὰ
λόγον δὲ καὶ τὸ κάλλος ἀκολουθεῖ τῶν . . . ἐὰν
τὰ ἄλλα τὴν αὐτὴν ἔχωσι θεραπείαν.

Δοκεῖ δὲ καὶ εἰς τὸ αὐτὸ ἀθρόα θεμένων καλλίω
γίνεσθαι καὶ βλαστάνειν· οὕτω γὰρ τὸ τοῦ
πράσου καὶ τὸ τοῦ σελίνου τιθέασιν ἀποδήσαντες
εἰς ὀθόνιον καὶ γίνονται μεγάλα.

5 Συμβάλλεται δέ τι καὶ ὁ τόπος πρὸς αὔξησιν·
κελεύουσι γοῦν, ὅταν τις μεταφυτεύῃ τὰ σέλινα,
πάτταλον κατακρούειν ἡλίκον ἂν βούληται ποιεῖν
τὸ σέλινον· τιθέναι δὲ καὶ ἐν ὀθονίῳ πάτταλον
κατακρούσαντα καὶ πλήσαντα κόπρου καὶ γῆς.

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[1] μάλιστα . . . δι' ὃ missing in UM Ald. Bas.; text as restored by Sch. from Cam., G and Plin. *l.c.*

[2] τό γε βλίτον conj. W.; τό γε πλεῖστον U; τό τε πλεῖστον Ald. H.

[3] ἐκκαυλεῖ: *cf.* 7. 1. 7; 7. 4. 3, and esp. *C.P.* 4. 3. 5.

[4] After ἀκολουθεῖ τῶν follows a lacuna of one and a half lines

it is ripened, quickly dries and is shed, and the herbs whose seed have an integument are harder still to dry, especially basil. All however, when dried, produce more fruit : wherefore [1] it is the custom to gather the seed early and dry it. All of them are prolific and produce many seeds, but basil produces most of all.

Examples of those which produce their fruit at the top of the stem are basil leek onion : of those which produce it rather at the sides, radish turnip and the like ; of those which produce it in both ways, blite and orach ; both of these produce it at the side as well as at the top ; in fact blite [2] has its seed in clusters, closely attached to each branch. Some push up their shoots [3] fairly soon from old seed, but seed from plants in their prime is the most rapid ; for these plants too have a time when they are at their best. The beauty of the plant also corresponds [4] in proportion, provided that equal care in [5] other respects is shewn in cultivation.

[6] It likewise appears that, if a quantity of seed is sown in the same place, the resulting crop comes up and germinates better ; thus they tie up seed of leek and celery in a piece of cloth [7] before sowing, and then there is a large [8] crop.

The position also contributes to growth ; at least, when celery is transplanted, they suggest that one should hammer [9] in a peg of whatever size one wishes to make the celery ; and also that one should sow the seed in a piece of cloth [10] after hammering in a peg and filling the hole with dung and soil.

in UMAld.; text as given by Cam., which however omits *τῶν* ; *τῶν σπειρομένων* H.; *τῶν τοιούτων* Vo. Vin.

[5] *cf.* 7. 4. 7. [6] Plin. 19. 120. [7] *cf. C.P.* 5. 6. 9.

[8] *μεγάλα* conj. St.; *μεγάλαι* Ald. H.

[9] Made clearer *C.P.* 5. 6. 7. [10] *cf. C.P.* 5. 6. 9.

Ἔνια δὲ καὶ τοῖς σχήμασιν ἐξομοιοῦται καὶ τοῖς τόποις· ἡ γὰρ σικύα ὁμοιοσχήμων γίνεται ἐν ᾧ ἂν τεθῇ ἀγγείῳ.

Καὶ διαφορὰν λαμβάνει κατὰ τοὺς χυμοὺς ἔνια προθεραπευθέντα τῶν σπερμάτων, οἷον τὸ τοῦ σικύου ἐὰν ἐν γάλακτι βρέξαντες σπείρωσιν. ἀλλὰ τὰ μὲν τοιαῦτα ἴσως οἰκειότερα τῆς θεραπείας.

IV. Γένη δὲ τῶν μέν ἐστι πλείω τῶν δ' οὐκ ἔστιν, οἷον ὠκίμου λαπάθου βλίτου καρδάμου εὐζώμου ἀδραφάξυος κοριάννου ἀνήθου πηγάνου· τούτων γὰρ οὔ φασιν εἶναι <γένους διαφοράν.> τῶν δὲ ἔστι, ῥαφανῖδος ῥαφάνου τευτλίου σικύου κολοκύντης κυμίνου σκορόδου θριδακίνης. διαιροῦσι δὲ τοῖς τε φύλλοις καὶ ταῖς ῥίζαις καὶ τοῖς χρώμασι καὶ τοῖς χυλοῖς καὶ τοῖς ἄλλοις τοῖς τοιούτοις.

2 Οἷον τῆς ῥαφανῖδος <γένη Κορινθίαν Κλεωναίαν Λειοθασίαν> ἀμωρέαν Βοιωτίαν· εὐαυξεστάτην δὲ τὴν Κορινθίαν, ἣ καὶ τὴν ῥίζαν ἔχει γυμνήν· ὠθεῖται γὰρ εἰς τὸ ἄνω καὶ οὐχ ὡς αἱ ἄλλαι κάτω. τὴν δὲ Λειοθασίαν, ἣν ἔνιοι καλοῦσι Θρᾳκίαν,

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[1] καὶ τοῖς τόποις Ald.; κατὰ τοὺς τόπους conj. W. *cf. C.P.* 5. 6. 7.

[2] ἀγγείῳ . . . λαμβάνει om. UMPAld.; διαφορὰν δὲ καὶ Cam.; τόπῳ· διαφέρειν δὲ καὶ H.; ἀγγείῳ conj. W. from *C.P.* 5. 6. 7; καὶ διαφορὰν conj. Sch. *cf. Geop.* 12. 19. 6.

[3] *cf.* 7. 1. 6; *Geop.* 12. 20. 3.

[4] After εἶναι there is a lacuna in UMAld.; Cam. supplies γένους διαφοράν· τῶν δὲ ἀνάπαλιν πλείω γένη; H. has πλείω γένη

Some things again come to resemble in their shape even the position[1] in which they grow: thus the bottle-gourd becomes like in shape to the vessel[2] in which it has been placed.

Moreover differences in taste are acquired in some cases when the seed has been treated specially beforehand; for instance, the seed of the cucumber produces a fruit with different taste if it is soaked[3] in milk before sowing. But such matters belong perhaps more properly to the subject of cultivation.

Of the various forms of some pot-herbs.

IV. Of some herbs there are several kinds, but of others only one, as basil monk's rhubarb blite cress rocket orach coriander dill rue; of each of these they say that there is[4] but one kind. But of others there is more than one, as radish cabbage beet cucumber gourd cummin garlic lettuce. Differences are marked in the leaves, the root, the colour, the taste, and so forth.

Thus of radish they recognise these various kinds[5] —the Corinthian, that of Cleonae, the Leiothasian, *amorea*, the Boeotian. The Corinthian is said to be the strongest in growth, and it has an exposed root; for it pushes upwards, and not downwards like the others. The Leiothasian[6] is called by some the

οὐδὲ γένους διαφοράν· τῶν δὲ ἀνάπαλιν πλείω γένη; Plin. 19. 123 rather supports H. ? read as in H.: τῶν δὲ ἐστι is perhaps an attempt to fill the lacuna.

[5] *cf.* Plin. 19. 75 and 76, who gives a kind called *viride* in place of T.'s ἀμωρέα: see below. After βαφανῖδος there is a lacuna in UMAld. (but U has τὴν δὲ μόραν Βοιωτίαν). Text restored from Athen. 2. 48 (*cf.* Plin. *l.c.*). Cam.H.Bas. (also Vo.Vin.(?)) give substantially the same.

[6] The name suggests Thasos, off the Thracian coast.

ἰσχυροτάτην πρὸς τοὺς χειμῶνας. τὴν δὲ Βοιωτίαν γλυκυτάτην καὶ τῷ σχήματι στρογγύλην, οὐχ ὥσπερ τὴν Κλεωναίαν μακράν. ὅσων δ' ἂν ᾖ λεῖα τὰ φύλλα, γλυκύτεραι καὶ ἡδίους, ὅσων δ' ἂν τραχέα, δριμύτεραι. γένος δέ τι παρὰ ταῦτα ἔστιν ὃ ἔχει τὸ φύλλον εὐζώμῳ ὅμοιον. ῥαφανῖδος μὲν οὖν ταῦτα.

3 Γογγυλίδος δὲ οἱ μέν φασιν εἶναι οἱ δ' οὔ φασιν, ἀλλὰ τῷ ἄρρενι καὶ τῇ θηλείᾳ διαφέρειν, γίνεσθαι δὲ ἐκ τοῦ αὐτοῦ σπέρματος ἄμφω. πρὸς δὲ τὸ ἀποθηλύνεσθαι πηγνύναι δεῖν μανάς· ἐὰν γὰρ πυκνάς, πάσας ἀπαρρενοῦσθαι, τὸν αὐτὸν δὲ τρόπον κἂν ἐν γῇ μοχθηρᾷ σπαρῶσι· δι' ὃ καὶ πρὸς σπερματισμὸν μεταφέροντες φυτεύουσι τὰς ἐκφύσεις καὶ πλατείας. ἔστι δὲ καὶ τὸ σπέρμα τῇ ὄψει τὸ χεῖρον καὶ βέλτιον φανερόν· τῆς μὲν γὰρ χρηστῆς λεπτὸν τῆς δὲ μοχθηρᾶς ἀδρόν. χειμαζομένη δὲ χαίρει καὶ αὕτη καὶ ἡ ῥαφανίς· οἴονται γὰρ ἅμα γλυκαίνεσθαί τε καὶ τὴν αὔξησιν εἰς τὴν ῥίζαν τρέπεσθαι καὶ οὐκ εἰς τὰ φύλλα. τοῖς δὲ νοτίοις καὶ ταῖς εὐδίαις ἐκκαυλεῖ ταχύ. τοῦτο μὲν οὖν λόγου δεῖται τῆς ὁμοιώσεως ἐν ἀμφοῖν εἶναι τὰς διαφοράς.

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[1] Diosc. 2. 112 mentions a kind called by the Romans *ἁρμοράκιον*. Plin. 19. 82 has *armoracia* and says that this was called *armon* in Pontus; Sch. suggests that the latter name may have given rise to both *armoracia* and *ἀμωρέα*.

[2] Plin. 18. 129, *cf.* 19. 75; Athen. 9. 7.

[3] *πηγνύναι*. The verb is used of planting seeds singly; *cf.* 6. 6. 9; 7. 1. 2; 7. 5. 3.

Thracian radish, and it stands the winter best. The Boeotian is said to be the sweetest and to be round in shape, not of a long shape like that of Cleonae. Those kinds whose leaves are smooth are sweeter and pleasanter to the taste, those whose leaves are rough have a somewhat sharp taste. Besides the above-mentioned kinds[1] there is yet another, whose leaves resemble those of rocket. These then are the different kinds of radish.

Of the turnip[2] all do not agree that there are several kinds, but some say that the only difference is between the 'male' and the 'female,' and that both forms come from the same seed. In order to produce 'female' plants it is said that the seed should be sown[3] thinly, for that, if it is sown thick, the result is all 'male' plants; and that the same result follows if the seed is sown in poor soil. Wherefore, when they are shifting plants for seeding,[4] they plant the seedlings[5] wide apart.[6] Good and inferior seed can be easily distinguished by their appearance; the seed of a good plant is fine, that of a poor one coarse. Both this plant and radish like exposure to winter; for it is supposed that this makes them sweeter and that they are thus made to grow roots rather than leaves. With a south wind and warm weather they run up quickly. It needs explanation that both plants should thus adapt[7] themselves in special ways.

[4] *πρὸς σπερματισμὸν* conj. W.; *τοὺς σπερματισμοὺς* Ald H. *cf.* 7. 5. 3. [5] *ἐκφύσεις*: *cf.* 3. 3. 7.

[6] *καὶ πλατείας* corrupt. *διεστηκυίας* (W.) gives the required sense; but there may be a loss of some words, *πλατείας* indicating that the object is to produce *broader* plants. *cf. C.P.* 5. 6. 9 and Sch.'s note.

[7] *τῆς ὁμοιώσεως* probably corrupt: no correction suggests itself.

4 Τῆς δὲ ῥαφάνου τριχῆ διαιρουμένης, οὐλοφύλλου τε καὶ λειοφύλλου καὶ τρίτης τῆς ἀγρίας, <ἡ ἀγρία> τὸ μὲν φύλλον ἔχει λεῖον μικρὸν δὲ καὶ περιφερές, πολύκλαδος καὶ πολύφυλλος, ἔτι δὲ χυλὸν ἔχουσα δριμὺν καὶ φαρμακώδη, δι' ὃ καὶ πρὸς τὰς κοιλίας αὐτῷ χρῶνται οἱ ἰατροί. ὁμοίως δὲ καὶ ἐν ἐκείναις δοκοῦσι διαφοραὶ καθ' ἑκατέραν· ἐπεὶ ἄσπερμόν τι γένος αὐτῶν ἐστιν ἢ κακόσπερμον. τὸ δ' ὅλον ἡ οὖλη τῆς λείας εὐχυλοτέρα καὶ μεγαλοφυλλοτέρα.

Εὐχυλότερον δὲ καὶ τῶν τευτλίων τὸ λευκὸν τοῦ μέλανος καὶ ὀλιγοσπερμότερον, ὃ καλοῦσί τινες Σικελικόν.

5 Ὡσαύτως δὲ καὶ τῆς θριδακίνης· ἡ γὰρ λευκὴ γλυκυτέρα καὶ ἁπαλωτέρα. γένη δὲ αὐτῆς ἐστὶν ἄλλα τρία, τό τε πλατύκαυλον καὶ στρογγυλόκαυλον καὶ τρίτον τὸ Λακωνικόν· αὕτη δὲ τὸ μὲν φύλλον ἔχει σκολυμῶδες, ὀρθὴ δὲ καὶ εὐαυξὴς καὶ ἀπαράβλαστος ἐκ τοῦ καυλοῦ. τῶν δὲ πλατειῶν οὕτω τινὲς πλατύκαυλοι γίνονται ὥστ' ἐνίους φασὶ καὶ θύραις χρῆσθαι κηπουρικαῖς. τὸ δὲ ὀπῶδες σφόδρα καὶ μικρόφυλλον καὶ λευκοκαυλότερον ἔοικεν ἀγρίᾳ.

6 Τῶν δὲ σελίνων καὶ ἐν τοῖς φύλλοις καὶ ἐν τοῖς καυλοῖς αἱ διαφοραί· τὸ μὲν γὰρ πυκνὸν καὶ οὖλον καὶ δασὺ τὸ φύλλον ἔχει, τὸ δὲ μανότερον καὶ πλατύτερον καυλὸν δὲ μείζω. τούτων δὲ πάλιν τὰ μὲν λευκόκαυλα τὰ δὲ πορφυρόκαυλα ἢ ποικιλόκαυλα· τὸ δ' ὅλον ἅπαν τὸ τοιοῦτον ἐμφερέστερον τῷ ἀγρίῳ.

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[1] Athen. 9. 9 ; Plin. 19. 80. [2] Wild radish. See Index.

[1] Of cabbage three kinds are distinguished, the curly-leaved, the smooth-leaved, and thirdly, the wild form.[2] The wild form[3] has a small round leaf, it has many branches and many leaves, and further a sharp medicinal taste; wherefore physicians use it for the stomach. Between the other two kinds[4] there seem also to be differences, inasmuch as one of them bears no seed or only inferior seed. In general the curly-leaved kind has a better flavour than the smooth and it has larger leaves.

[5] So too with beet; the white kind has a better flavour than the black and produces fewer seeds; some call it 'Sicilian' beet.

So too with lettuce; the white kind is sweeter and tenderer. Of this plant there are three other kinds,[6] the flat-stalked, the round-stalked, and the Laconian; the last-named has a leaf like the golden thistle,[7] but is erect and strong-growing and has no side-shoots[8] from the main stem. Of the 'flat' kinds some have such flat stalks that some, they say, use them to make a garden trellis.[9] The third kind, which has much milky juice and small leaves and a whiter stem, is like a wild plant.

[10] In celery the differences between the various kinds lie in the leaves and stem; one kind is close and curly and has rough leaves, the other is more open in growth and flatter, but has a larger stalk. Again there are kinds with stems white, red or parti-coloured; and in general all such forms resemble more the wild kind.

[3] *ἡ ἀγρία* add. W.
[4] *ἐκείναις* conj. Sch. from Plin. *l.c.*; *ἐκείνῳ* Ald. H.
[5] Athen. 9. 11; Plin. 19. 132.
[6] Plin. 19. 125. [7] Athen. 2. 79. [8] *cf.* 7. 2. 4.
[9] *ostiola olitoria* Plin. 19. 125. [10] Plin. 19. 124.

Σικύου δὲ καὶ κολοκύντης τοῦ μὲν εἶναί φασι γένη τῆς δ' οὐκ εἶναι, καθάπερ τῆς ῥαφανῖδος καὶ τῆς γογγυλίδος, ἀλλ' ἐν τῷ αὐτῷ γένει τὰς μὲν βελτίους τὰς δὲ χείρους. τοῦ δὲ σικύου τρία, Λακωνικὸν σκυταλίαν Βοιώτιον· τούτων δὲ ὁ μὲν Λακωνικὸς ὑδρευόμενος βελτίων, οἱ δ' ἕτεροι ἀνύδρευτοι.

7 Διαφέρει δὲ γένει καὶ τὰ κρόμυα καὶ τὰ σκόροδα. πλείω δὲ τοῦ κρομύου τὰ γένη, οἷον τὰ κατὰ τὰς χώρας ἐπικαλούμενα Σάρδια Κνίδια Σαμοθράκια, καὶ πάλιν τὰ σητάνια καὶ σχιστὰ καὶ Ἀσκαλώνια. τούτων δὲ τὰ μὲν σητάνια μικρὰ γλυκέα δὲ εὖ μάλα, τὰ δὲ σχιστὰ καὶ ἀσκαλώνια καὶ ταῖς θεραπείαις διαφέροντα καὶ δῆλον ὅτι τῇ φύσει· τὸ γὰρ σχιστὸν τῷ μὲν χειμῶνι μετὰ τῆς κόμης ἐῶσιν ἀργόν, ἅμα δὲ τῷ ἦρι τὰ φύλλα περιαιροῦσι τὰ ἔξω καὶ τὰ ἄλλα θεραπεύουσι· περιαιρεθέντων δὲ τῶν φύλλων ἕτερα βλαστάνει καὶ ἅμα κάτω σχίζεται, δι' ὃ καλοῦσι σχιστά. οἱ δὲ καὶ ὅλως φασὶ πάντων δεῖν, ὅπως ἡ δύναμις εἰς τὸ κάτω καὶ μὴ σπερ-
8 μοφυῇ. τῶν δὲ Ἀσκαλωνίων ἰδία τις ἡ φύσις· μόνα γὰρ <οὐ> σχιστὰ καὶ ὥσπερ ἄγονα ἀπὸ τῆς ῥίζης, ἔτι δὲ ἐν αὐτοῖς ἀναυξῆ καὶ ἀνεπίδοτα·

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[1] Athen. 3. 4; Plin. 19. 68.
[2] Plin. 19. 101–104.
[3] Σάρδια conj. Meurs. from Plin. *l.c.*; γάρδια Ald. H.
[4] *i.e.* making offsets.
[5] Ἀσκαλώνια, whence Eng. shallot; though this name is applied to κ. σχιστόν.
[6] τὸ add. W.

As to cucumber and gourd, it is said that there are various forms of the former, but of the latter, just as in radish and turnip, the differences are only between better and inferior individuals. [1] Of the cucumber there are three forms, the Laconian the cudgel-shaped and the Boeotian. Of these the Laconian is better with moisture, the others without it.

[2] There are also various kinds of onion and of garlic; those of the onion are the more numerous, for instance, those called after their localities Sardian,[3] Cnidian, Samothracian; and again the 'annual' the 'divided'[4] (shallot) and that of Ascalon.[5] Of these the annual kind is small but very sweet, while the divided and the Ascalonian differ plainly as to their character as well as in respect of their cultivation. For the 'divided'[6] kind they leave untended in winter with its foliage,[7] but in spring they strip off[8] the outside leaves and tend the plant in other ways; when the leaves are stripped off, others grow, and at the same time division takes place under ground, which is the reason of the name 'divided.'[9] Some indeed say that all kinds should be thus treated, in order that the force of the plant may be directed downwards and it may not go to seed. The Ascalonian kind has a somewhat peculiar character; it is the only kind which does not[10] divide and which does not, as it were, reproduce itself from the root; moreover in the plant[11] itself there is no power of increasing and multiplying; wherefore

[7] *κόμης ἐῶσιν* conj. Scal.; *κοιμησέως* UMP$_2$Ald.
[8] *περιαιροῦσι* conj. Scal. from Plin. *l.c.* and G; *περιάγουσι* P$_2$Ald. H. [9] *cf.* Pall. 3. 24. 3.
[10] *οὐ* add. Scal. [11] *i.e.* the part above ground.

δι' ὃ καὶ οὐ πηγνύουσιν ἀλλὰ σπείρουσιν αὐτὰ καὶ σπείρουσιν ὀψὲ πρὸς τὸ ἔαρ, εἶθ' ὅταν βλαστήσῃ μεταφυτεύουσι· τελειοῦται δὲ οὕτω ταχέως ὥσθ' ἅμα τοῖς ἄλλοις ἢ καὶ πρότερον ἐξαιρεῖσθαι· πλέονα δὲ χρόνον ἐαθέντα ἐν τῇ γῇ σήπεται· φυτευθέντα δὲ καυλὸν ἀφίησι καὶ σπέρμα φύει μόνον, εἶτα κενοῦται καὶ αὐαίνεται. τούτων μὲν οὖν τοιαύτη τις ἡ φύσις.

9 Διαφέρει δ' ἔνια καὶ τοῖς χρώμασιν· ἐν Ἰσσῷ γὰρ τὰ μὲν ἄλλα ὅμοια τοῖς ἄλλοις, λευκὰ δὲ σφόδρα τῇ χροιᾷ· φέρειν δέ φασιν ὅμοια τοῖς Σαρδιανοῖς. ἰδιωτάτη δὲ ἡ φύσις ἡ τῶν Κρητικῶν, παραπλησία δὲ τρόπον τινὰ τοῖς Ἀσκαλωνίοις, εἰ μὴ ἄρα καὶ ἡ αὐτή. ἐν Κρήτῃ γάρ ἐστί τι γένος ὃ σπειρόμενον μὲν ῥίζαν ποιεῖ φυτευόμενον δὲ καυλὸν καὶ σπέρμα, κεφαλὴν δὲ οὐκ ἴσχει, γλυκὺ δὲ τῷ χυμῷ· τοῦτο γὰρ οἷον ἀνάπαλιν ἔχει τοῖς
10 ἄλλοις. ἅπαντα γὰρ πηγνύμενα καὶ βελτίω καὶ θᾶττον παραγίνεται. πάντα δὲ φυτεύεται μετ' Ἀρκτοῦρον ἔτι θερμῆς οὔσης τῆς γῆς, ὅπως τὰ ὕδατα πεφυτευμένα καταλαμβάνῃ. καὶ ὅλα δὲ φυτεύεται καὶ διατεμνόμενα παρὰ τὴν κεφαλήν. οὐχ ὅμοιαι δὲ αἱ ἐκβλαστήσεις, ἀλλ' ἐκ μὲν τοῦ κάτω γίνεται κρόμυον, ἐκ δὲ τοῦ ἄνω

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[1] πηγνύουσι: *cf.* 7. 4. 3 n. The word evidently has a different sense here; *cf.* § 10, where πηγνύω and φυτεύω seem to be synonymous.

[2] οὕτω conj. Sch. from G; τοῖς ἄλλοις Ald.

[3] *i.e.* instead of being raised from seed. *cf.* what is said 7. 2. 2 of the offsets of γήθυον.

many do not plant[1] these, but raise them from seed; and the sowing is made late, towards the spring; and then, when the seed has germinated, they transplant. And the plant arrives at maturity so[2] fast that it is taken up with the others or even earlier; whereas, if it is left a longer time in the ground, it rots. If planted on the other hand,[3] it sends up a stem and merely produces seed, and then shrivels up[4] and withers. Such then is the character of these.

Some also shew differences in colour; thus at Issus[5] are found plants which in other respects resemble the others,[6] but which are extremely white in colour; and they bear, it is said, onions like those of Sardis. Most distinct however is the character of the Cretan kind, which resembles to some extent that of Ascalon, if indeed it be not the same. For in Crete there is a kind which when sown produces a root, but when planted produces a stem and seed but has no 'head';[7] and it is sweet in flavour. This kind in fact has just the contrary character to the others; for they all grow better and faster when they are planted. All are planted[8] after the rising of Arcturus while the earth is still warm, so that the rains may come upon them after planting. They are planted[9] either entire or else in sections made by cutting at the 'head.' The growth which results is not uniform; from the lower part comes an onion,

[4] κενοῦται conj. St. from G *exinaniuntur*; καινοῦται Ald.
[5] Ἴσσῳ conj. Sch. from G and Plin. *l.c.*; ἴσῳ UM; νήσῳ Ald. H.
[6] ἄλλοις conj. Sch.; λευκοῖς Ald. [7] Sc. bulb.
[8] φυτεύεται conj. Sch.; φύεται Ald. See next note.
[9] φυτεύεται M; φύεται Ald. *cf. C.P.* 1. 4. 5.

χλόη μονον· ὀρθὸν δὲ διατμηθὲν ὅλως ἀβλαστές ἐστι. τὸ δὲ γήτειον καλούμενον ἀκέφαλόν τι καὶ ὥσπερ αὐχένα μακρὸν ἔχον, ὅθεν καὶ ἡ βλάστησις ἄκρα· καὶ ἐπικείρεται πολλάκις, ὥσπερ τὸ πράσον, δι' ὃ καὶ σπείρουσιν αὐτὸ καὶ οὐ φυτεύουσι. τὰ μὲν οὖν κρόμυα σχεδὸν ταύτας ἔχει τὰς ἰδέας.

11 Τὸ δὲ σκόροδον φυτεύεται μὲν μικρὸν πρὸ τροπῶν ἢ μετὰ τροπὰς διαιρούμενον κατὰ γέλγεις. διαφορὰ δέ ἐστιν αὐτῶν ἥ τε τῶν ὀψίων πρὸς τὰ πρώϊα· γένος γάρ τι τυγχάνει τοιοῦτον ὃ ἐν ἑξήκοντα ἡμέραις τελειοῦται, καὶ μεγέθει καὶ μικρότητι. καὶ τῷ μεγέθει γένος τι διάφορόν ἐστι, μάλιστα δὲ τὸ Κύπριον καλούμενον τοιοῦτον, ὅπερ οὐχ ἑψοῦσιν ἀλλὰ πρὸς τοὺς μυττωτοὺς χρῶνται, καὶ ἐν τῇ τρίψει θαυμαστὸν ποιεῖ τὸν ὄγκον ἐκπνευματούμενον. καὶ ἔτι τῷ μὴ ἔχειν ἕνια τὰς γέλγεις. ἡ δὲ γλυκύτης καὶ ἡ εὐωδία καὶ ἡ ἁδρότης σχεδὸν παρὰ τὰς χώρας γίνεται καὶ τὰς θεραπείας, ὥσπερ καὶ τῶν ἄλλων. τελειοῦται δὲ καὶ ἀπὸ σπέρματος ἀλλὰ βραδέως· τῷ πρώτῳ γὰρ ἔτει κεφαλὴν ἡλίκην πράσου λαμβάνει, τῷ δ' ὕστερον γελγιδοῦται, καὶ τῷ τρίτῳ τέλειον γίνεται, καὶ οὐδὲν χεῖρον ἀλλ' ἔνιοί γε
12 καὶ κάλλιόν φασι τοῦ πηκτοῦ. τῆς δὲ ῥίζης ἡ γένεσις οὐχ ὁμοία τοῦ τε σκορόδου καὶ τοῦ κρομύου· ἀλλὰ τοῦ μὲν σκορόδου ὅταν ἀνοιδήσῃ ἡ γελγὶς κυρτοῦται πᾶσα καὶ ἐνταῦθα αὐξηθεῖσα διαιρεῖται πάλιν εἰς τὰς γέλγεις καὶ ἐξ ἑνὸς πολλὰ γίνεται τῷ τελειοῦσθαι τὴν κεφαλήν, τὸ δὲ

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[1] *i.e.* bulb; *cf.* 9. 11 6. [2] *cf.* 7. 2. 2.
[3] Plin. 19. 111 and 112.

from the upper only foliage; while, if the plant is divided vertically, no growth at all takes place. The kind called horn-onion has no 'head,'[1] but has as it were a long neck, at the top of which comes the new growth; it is often cut, like the leek; wherefore it is raised from seed and not planted.[2] Such then, one may say, are the forms of the onion.

[3] Garlic is planted a little before or after the solstice, when it divides into cloves.[4] There are different kinds distinguished as late or early, for there is one kind which matures in[5] sixty days. There are also differences as to size. There is one kind which excels in size, especially that variety which is called Cyprian, which is not cooked but used for salads, and, when it is pounded up, it increases wondrously in bulk, making a foaming dressing. There is a further difference, in that some kinds cannot be divided into cloves. The sweetness of taste and smell and the vigour depend on the position[6] and on cultivation, as with other herbs. Garlic reaches maturity from seed, but slowly, for in the first year it acquires a 'head' which is only as large as that of the leek, but in the next year it divides into cloves, and in the third is fully grown, and is not inferior, indeed some say it is superior, to the garlic which has been planted.[7] The growth of the root in garlic and onion is not the same; in garlic, when the clove has swollen, the whole of it becomes convex[8]; then it increases and divides again into the cloves, and becomes several plants instead of one by the maturing of the 'head,'

[4] *γέλγεις* conj. Scal. from G (*nucleatim divisum*); *γέση* Ald.
[5] *ὃ ἐν* conj. Sch.; *ὅθεν* UMAld.
[6] *χώρας* conj. Dalec.; *ὥρας* UMP_2Ald.
[7] Sc. not raised from seed. [8] So W. renders.

κρόμυον εὐθὺς ἐκ τῆς ῥίζης ἄλλο καὶ ἄλλο παραφίησι, καθάπερ καὶ βολβοὶ καὶ σκίλλα καὶ πάντα τὰ τοιαῦτα. καὶ γὰρ τὰ κρόμυα καὶ τὰ σκόροδα μὴ ἀναιρούντων ἀλλ' ἐώντων πολλὰ γίνεται. φέρειν δέ φασι καὶ τὸ σκόροδον ἐπὶ τῆς φύσιγγος σκόροδα καὶ τὸ κρόμυον κρόμυα· περὶ μὲν οὖν τῶν γενέσεων ἱκανῶς εἰρήσθω.

V. Φίλυδρα δὲ πάντα τὰ ἄλλα λάχανα καὶ φιλόκοπρα πλὴν πηγάνου, τοῦτο δὲ ἥκιστα φιλόκοπρον. τὰ χειμερινὰ δὲ οὐχ ἧττον τῶν θερινῶν καὶ τὰ ἐπίκηρα τῶν ἰσχυρῶν. κόπρον δὲ μάλιστα ἐπαινοῦσι τὴν συρματῖτιν, τὴν δὲ τῶν ὑποζυγίων μοχθηρὰν διὰ τὸ μάλιστα ἐξικμάζεσθαι· ζητοῦσι δὲ τὴν κόπρον ἅμα τῷ σπόρῳ μάλιστα συναναμιχθεῖσαν· οἱ δὲ καὶ σπείροντες ἐπιβάλλουσι· χρῶνται δὲ καὶ τῇ ἀνθρωπίνῃ ὠμῇ πρὸς τὴν χύλωσιν. φιλυδρότερα δὲ τὰ χειμερινὰ τῶν θερινῶν καὶ τὰ ἀσθενῆ τῶν ἰσχυρῶν, ἔτι δὲ τὰ πλείστης δεόμενα τροφῆς. φίλυδρα καὶ τὸ κρόμυον καὶ τὸ γήθυον· καίτοι φασί τινες οὐ ζητεῖν, ἐὰν τὸ πρῶτον ἐπιγένηται δὶς ἢ τρίς.
2 τῶν δὲ ὑδάτων ἄριστα τὰ πότιμα καὶ τὰ ψυχρά, χείριστα δὲ τὰ ἁλυκὰ καὶ δυσμανῆ, δι' ὃ καὶ ἐκ τῶν ὀχετῶν οὐ χρηστά· συμπεριφέρει γὰρ σπέρματα πόας. ἀγαθὰ δὲ τὰ ἐκ διός· ταῦτα

[1] *cf.* 7. 2. 2 and 3.
[2] *φύσιγγος* conj. Casaub. on Athen. 2. 78; *σφύριγγος* UM Ald. See LS *φύσιγξ*.
[3] *καὶ τὸ κρόμυον κρόμυα* conj. Sch.; *καὶ τὰ κρόμμυα* UMAld.
[4] Plin. 19. 156.

while the onion puts out another and another growth straight from the root, as do purse-tassels[1] and squill and all such plants. For both onions and garlic multiply if they are not removed but left alone. They say also that garlic produces garlic heads on the stalk,[2] and that the onion in like manner produces onions.[3] Let this suffice for an account of their ways of growth.

Of the cultivation of pot-herbs; manure and water.

V. [4] All the pot-herbs are lovers of water and of dung, except rue, which does not at all like dung; this is true of the winter no less than of the summer herbs, and of the tender no less than of the strong ones. The dung which is most commended is that which is mixed with litter, while that of beasts of burden is held to be bad, because it is most apt to lose its moisture. Dung which is mixed with the seed is most in request, but some cast the manure on while they are sowing, and they also use fresh human dung as a liquid manure.[5] The winter crops like moisture more than the summer ones, and the weak more than the strong, as well as those which specially need feeding. Onion and long onion also love moisture, though some say that they do not require it, if at the outset it has been applied twice or thrice. [6] Fresh cold water is the best, and the worst is that which is brackish and thick:[7] wherefore the water from irrigation ditches is not good, for it brings with it seeds of weeds. Rain

[5] Lit. 'for their liquid-manuring.' *cf. C.P.* 3. 9. 2, where χύλωσις must have the same sense.
[6] Plin. 12. 182 and 183.
[7] δυσμανῆ UMAld.; δυσμενῆ H.

γὰρ δοκεῖ καὶ φθείρειν τὰ θηρία [γινόμενα] τὰ γόνιμα κατεσθίοντα. φασὶ δέ τινες οὔτε τοῖς σικύοις συμφέρειν οὔτε τοῖς κρομύοις. ἀρδεύουσι δὲ τὰ μὲν ἄλλα πρωΐ ἢ πρὸς ἑσπέραν, ὅπως μὴ καθέψηται, τὸ δὲ ὤκιμον καὶ μεσημβρίας· καὶ γὰρ διαβλαστάνειν θᾶττόν φασι θερμῷ τὸ πρῶτον ἀρδευόμενον. τὸ δὲ πολὺ λίαν ὕδωρ δοκεῖ συμφέρειν ἄλλως τε καὶ ἐὰν [μὴ] ἔχῃ κόπρον· πολλάκις γὰρ πεινῆν τὰ λάχανά φασι, καὶ ταῦτα γνωρίζειν τοὺς ἐμπείρους τῶν κηπουρῶν.

3 Μεταφυτευόμενα δὲ πάντα καλλίω καὶ μείζω γίνεται· καὶ γὰρ τὰ τῶν πράσων μεγέθη καὶ τὰ τῶν ῥαφανίδων ἐκ μεταφυτείας. μάλιστα δὲ μεταφυτεύουσι πρὸς τοὺς σπερματισμούς· καὶ τὰ μὲν ἄλλα ὑπομένει, οἷον γήθυον πράσον ῥάφανος σίκυος σέλινον γογγυλὶς θρῖδαξ, <τὰ δὲ> γλίσχρως. ἅπαντα δ' εὐαυξέστερα καὶ μείζω πηγνυμένων τῶν σπερμάτων ἢ σπειρομένων.

4 Θηρία δὲ γίνεται ταῖς μὲν ῥαφανίσι ψύλλαι, τῇ δὲ ῥαφάνῳ κάμπαι καὶ σκώληκες, καὶ ἐν τῇ θριδακίνῃ καὶ ἐν τοῖς πράσοις καὶ ἐν ἄλλοις δὲ πλείοσιν αἱ πρασοκουρίδες. ταύτας μὲν οὖν ἡ κράστις ἀθροισθεῖσα ἀπόλλυσι καὶ ὅταν κόπρος

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[1] γινόμενα τὰ γόνιμα H.; γινόμενα γόνιμα UMAld.; ? τὰ τὸ γόνιμα. Either γινόμενα or γόνιμα seems to be due to dittography. For γόνιμα *cf. C.P.* 1. 15. 1 : τὰς γονίμους ἀρχάς.

[2] καθέψηται conj. Sch. after Plin. *l.c.*; καθάψηται P_2Ald.

[3] ἔχῃ κόπρον conj. Dalec.; μὴ ἔχῃ κ. Ald.; μετέχῃ κόπρου conj. W. *cf.* 7. 5. 1, χύλωσιν; *C.P.* 3. 9. 2.

[4] Plin. 19. 183.

water is good, for it also appears to destroy the pests which devour the young plants.[1] Some however say that rain-water is not good for melons nor for onions. Most herbs are watered in early morning or at evening, so that they may not be dried up[2]; but basil is watered even at noon, for it is said that it grows more quickly if it is watered at first with warm water. In general water seems to be extremely beneficial, especially if it is mixed with dung[3]; for, they say, pot-herbs often are hungry, and experienced gardeners can recognise when this is so.

[4] All herbs grow finer and larger if transplanted; for even the size of leeks and radishes depends on transplantation. Transplanting is done especially in view of collecting seed[5]: and, while most herbs bear it well, as long onion leek cabbage cucumber celery turnip lettuce, others bear it less well.[6] All however make better growth and are larger if the seed is planted[7] rather than scattered.

Of the pests which infest pot-herbs.

[8] As for pests,—radish is attacked by spiders,[9] cabbage by caterpillars and grubs, while in lettuce, leek, and many other herbs occur 'leek-cutters.'[10] These are destroyed by collecting green fodder,[11] or when they have been caught somewhere in a mass

[5] *σπερματισμοὺς* conj. Scal.; *σπερματικοὺς* UMAld. *cf.* 7. 4. 3.
[6] *τὰ δὲ γλίσχρως* conj. Sch., adding *τὰ δὲ*; *γλίσχρως* U; *γλίσχροι* M; *γλίσχρος* Ald.; *γλήχων* conj. Scal. Sch. also conjectures *τὰ λίσχρα*: see LS. *s.v.*
[7] *πηγνυμένων*: *cf.* 6. 6. 9; 7. 4. 3.
[8] Plin. 19. 177.
[9] *ψύλλαι*: *cf.* Arist. *H.A.* 9. 39. 1.
[10] *πρασοκουρίδες*: ? leaf-maggots. *cf.* Arist. *H.A.* 5. 19. 20; *Geop.* 12. 9.
[11] *κράστις* conj. R. Const.; *κρᾶσις* Ald.

ἀθρόα που καταλάβῃ· φιλόκοπρον δ' ὂν τὸ θηρίον ἀναδύεται καὶ ἐνδῦσα κοιμᾶται ἐν τῇ κόπρῳ, δι' ὃ δὴ ῥᾴδιον θηρεύειν· ἄλλως δ' οὐκ ἔστι. ταῖς δὲ ῥαφανῖσι πρὸς τὰς ψύλλας πρόσφορον τὸ ἐπισπείρειν ὀρόβους. πρὸς δὲ τὸ μὴ γίνεσθαι ψύλλας οὔ φασιν εἶναι φάρμακον οὐδέν. ὑπὸ δὲ τὸ ἄστρον ὤκιμον μὲν λευκαίνεται κορίαννον δὲ ἁλμᾷ. τὰ μὲν οὖν συμβαίνοντα διὰ τούτων θεωρητέον.

5 *Τῶν δὲ σπερμάτων τὰ μέν ἐστιν ἰσχυρότερα τὰ δὲ ἀσθενέστερα πρὸς διαμονήν· ἰσχυρότερα μὲν οἷον κορίαννον τεύτλιον πράσον κάρδαμον νᾶπυ εὔζωμον θύμβρα, ἁπλῶς τὰ δριμέα πάντα· ἀσθενέστερα δὲ γήθυον, τοῦτο γὰρ οὐκ ἐθέλει μένειν, ἀδράφαξυς ὤκιμον κολοκύντη σίκυος, ἁπλῶς τὰ θερινὰ τῶν χειμερινῶν μᾶλλον. διαμένει δὲ οὐδὲν πλέον τεττάρων ἐτῶν ὥστε ἔτι χρήσιμον εἶναι πρὸς τοὺς σπόρους· ἀλλὰ διένα μὲν βελτίω, τὰ δὲ τριένα οὐδὲν χείρω, τὸ δ' ὑπερτεῖνον ἤδη χεῖρον.*

6 *Πρὸς δὲ τὴν μαγειρικὴν χρείαν ἐπὶ πλείω δια-*

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[1] *κόπρος ἀθρόα που καταλάβῃ* Ald.; *κόπρον ἀθρόαν πού τις καταβάλῃ* conj. W. after Sch.; *κόπρον ἀθρόαν* conj. Scal.

[2] *φιλόκοπρον δ' ὂν τὸ θήριον ἀναδύεται καὶ ἐνδῦσα* conj. W.; *φιλόπονον τὸ θήριον ἀναδεύεται καὶ ἐν αἷς κοιμᾶται* UMAld.; *φίλυπνον* conj. R. Const., but W.'s conj. is confirmed by *Geop. l.c.* The change of gender in *ἐνδῦσα* is strange.

[3] *πρὸς τὰς ψύλλας πρόσφορον τὸ* mBas.; *ψύλλας πρὸς τὸ* Ald. H.; *πρὸς τὰς ψύλλας ἀρκεῖ τὸ* conj. W.

[4] *ψύλλας* Ald.; *καμπὰς* conj. Sch. followed by W.

[5] *cf. Geop.* 12. 7; Pall. 1. 35. 8; Plin. *l.c.*

of dung,[1] the pest being fond of dung emerges, and, having entered the heap, remains dormant there[2]; wherefore it is then easy to catch, which otherwise it is not. To protect[3] radishes against spiders[4] it is of use to sow vetch[5] among the crop; to prevent the spiders from being engendered they say that there is no specific. [6]Basil turns pale about the rising of the dog-star, and coriander becomes mildewed.[7] In these instances we may observe the accidents which occur to pot-herbs.

Of the time for which seed of pot-herbs can be kept.

[8]Of seeds some have more vitality than others as to keeping; among the more vigorous ones are coriander beet leek cress mustard rocket savory, and in general[9] those of pungent taste; among the less vigorous are long onion—which will not keep—orach basil gourd cucumber; and in general the summer herbs keep less well than the winter ones. No seed will keep more than four years so as still to be of use for sowing; though it is better in the second year,[10] in some cases it does not deteriorate in three years,[11] but after that time[12] deterioration begins.

However for cooking purposes seed will keep a

[6] Plin. 19. 176.

[7] ἁλμᾷ conj. W.; ἅλμαι MAld.; ἁλμαίνεται Vo. Vin.; ἁλμᾶται mBas. *cf.* 8. 10. 1; *C.P.* 6. 10. 5. In all three places W. introduces this word, comparing ψωριᾶν ἐρυσιβᾶν, etc.

[8] Plin. 19. 181.

[9] ἁπλῶς conj. St. from G; ἄλλως Ald.; ἄλως U.

[10] διένα conj. Scal.; δι' ἔνα UMAld.H.

[11] τὰ δὲ τριένα conj. W.; διὰ δὲ τρεῖς UMAld.H.

[12] ὑπερτεῖνον conj. Scal.: *cf.* 8. 11. 5; ὑπὲρ γαῖον UMAld.; ὑπερβαῖνον H.

μένει, πλὴν ἀσθενέστερα ταῦτα ἀναγκαῖον εἶναι διὰ τὴν ἀναπνοὴν καὶ τὴν σκωλήκωσιν. φθορὰ δὲ μάλιστα μὲν ὑπὸ τῶν θηρίων· γίγνεται γὰρ ἐν ἅπασι καὶ τοῖς δριμέσιν, ἥκιστα δὲ ἐν τῷ σικυῶνι· οὐ μὴν ἀλλὰ καὶ ἐξικμαζόμενα πικρὰ γίνεται τῇ γεύσει, δι' ὃ καὶ πρὸς τὴν χρείαν χείρω. καὶ περὶ μὲν τῶν σπερμάτων καὶ ἁπλῶς τῶν κηπευομένων ἱκανῶς εἰρήσθω.

VI. Περὶ δὲ τῶν ἀγρίων καὶ τῶν καλουμένων ἀρουραίων πειρατέον ὁμοίως εἰπεῖν. τυγχάνει δὲ τὰ μὲν ὁμώνυμα τοῖς ἡμέροις· ἅπαντα γάρ ἐστι τὰ γένη ταῦτα καὶ ἄγρια, καὶ σχεδὸν τά γε πολλὰ παραπλησίαν ἔχοντα τὴν ὄψιν τοῖς ἡμέροις, πλὴν τοῖς γε φύλλοις ἐλάττω ταῦτα καὶ τραχύτερα καὶ τοῖς καυλοῖς καὶ μάλιστα τοῖς χυλοῖς δριμύτερα καὶ ἰσχυρότερα, καθάπερ ἥ τε θύμβρα καὶ ἡ ὀρίγανος ἥ τε ῥάφανος καὶ τὸ πήγανον· ἐπεὶ καὶ τὸ λάπαθον ἄγριον, καίπερ εὐστομώτερον τοῦ ἡμέρου ὄν, τὸν χυλὸν ὅμως ὀξύτερον ἔχει καὶ τούτῳ μάλιστα διαφέρει. πάντα δὲ καὶ ξηρότερα τῶν ἡμέρων, καὶ ἴσως αὐτῷ τούτῳ τά γε πολλὰ καὶ δριμύτερα καὶ ἰσχυρότερα.

2 Ἰδίως δὲ ἡ ῥάφανος ἔχει παρὰ τὰ ἄλλα τοὺς καυλοὺς περιφερεστέρους καὶ λειοτέρους τῆς ἡμέ-

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[1] *i.e.* drying-up ; *cf.* Plat. *Tim.* 85 A.

[2] *σκωλήκωσιν* conj. Sch.; *κώλυσιν* Ald.; *σκωλήκησιν* conj. R. Const.

[3] *σικυῶνι* Ald.: perhaps here a general term for cucumbers, gourds, etc.; *σικυῶν* M ; *σικύῳ* conj. W.

[4] Plin. 19. 185.

longer time, except that such seed must necessarily become less vigorous by reason of 'evaporation'[1] and destruction by worms.[2] The chief cause of loss is vermin; for vermin occur in all the seeds, even those which are pungent, though least in the gourd[3] tribe; such seeds however, as they lose their moisture, become bitter in taste and inferior for use. Let this suffice for an account of the seeds and in general of herbs cultivated in gardens.

Of uncultivated herbs: the wild forms of pot-herbs.

VI. [4] We must now endeavour to speak in the same way of the wild kinds and of those which are called uncultivated herbs. Some of these have the same names as the cultivated[5] kinds; for all these kinds exist also in a wild form, and most of them resemble the cultivated kinds in appearance, except that in the wild forms the leaves and also the stalks are smaller and rougher, and in particular these forms are more pungent and stronger in taste, for instance, savory[6] marjoram cabbage and rue; the wild monk's rhubarb (dock) indeed, though it has a pleasanter taste than the cultivated, yet has[7] a sharper flavour; and this is the chief difference. Moreover all the wild kinds are less juicy than the cultivated, and perhaps this is the very reason why most[8] of them are more pungent and stronger.

A peculiarity of 'wild cabbage' as compared with the others is that its stems are rounder and smoother

[5] *ἡμέροις* conj. Sch.; *εἰρημένοις* Ald. The correction would seem unnecessary but that Ald. gives *εἰρημένοις* in § 4 where *ἡμέρους* is required. [6] *cf.* Diosc. 3. 37.

[7] *ὄν, τὸν* I conj.; *τὸν δὲ* MSS. W.

[8] *γε* conj. Sch.; *τε* UMAld.

ρου, καὶ τὴν τοῦ φύλλου πρόσθεσιν ἐκείνη μὲν ἔχει πλατεῖαν αὕτη δὲ περιφερεστέραν, καὶ αὐτὸ δὲ τὸ φύλλον ἀγωνότερον· ἐπεὶ τά γε ἄλλα τραχύτερα καὶ τοῖς καυλοῖς καὶ τοῖς φύλλοις.

Ἡ δὲ γογγυλὶς καὶ τὴν ῥίζαν ἔχει μακρὰν καὶ ῥαφανιδώδη καὶ τὸν καυλὸν βραχύν.

Θριδακίνη δὲ τό τε φύλλον βραχύτερον τῆς ἡμέρου, καὶ τελευμένης[3] ἀκανθοῦται, καὶ τὸν καυλὸν ὁμοίως, τὸν ὀπὸν δὲ δριμὺν καὶ φαρμακώδη. φύεται δ' ἐν ταῖς ἀρούραις· ὀπίζουσι δ' αὐτὴν ὑπὸ πυραμητόν, καί φασι καθαίρειν ὕδρωπα καὶ ἀχλὺν ἀπ' ὀφθαλμῶν ἀπάγειν καὶ ἄργεμα ἀφαιρεῖν ἐν γάλακτι γυναικείῳ.

3 Τὸ δ' ἱπποσέλινον καὶ ἐλειοσέλινον καὶ ὀρεοσέλινον καὶ πρὸς ἑαυτὰ διαφορὰν ἔχει καὶ πρὸς τὸ ἥμερον· τὸ μὲν γὰρ ἐλειοσέλινον τὸ παρὰ τοὺς ὀχετοὺς καὶ ἐν τοῖς ἕλεσι φυόμενον μανόφυλλόν τε καὶ οὐ δασὺ γίνεται, προσεμφερὲς δέ πως τῷ σελίνῳ καὶ τῇ ὀσμῇ καὶ τῷ χυλῷ καὶ τῷ σχήματι. τὸ δ' ἱπποσέλινον φύλλον μὲν ἐμφερὲς τῷ ἐλειοσελίνῳ, δασὺ δὲ καὶ μεγαλόκαυλον καὶ τὴν ῥίζαν ὥσπερ ῥαφανὶς ἔχει τὸ πάχος μέλαιναν· μέλας δὲ καὶ ὁ καρπός, μέγεθος δὲ μεῖζον ὀρόβου. χρήσιμα δ' ἄμφω φασὶ πρὸς στραγγουρίαν εἶναι ἐν οἴνῳ γλυκεῖ λευκῷ καὶ τοῖς λιθιῶσι· φύεται δὲ

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[1] τραχύτερα conj. Sch.; τραχύτερον Ald., which contradicts what has just been said.

[2] Plin. 20. 20; Diosc. 2. 110.

[3] τελευμένης conj. W.; τελεούμενος U; τελειούμενον P_2Ald. *cf. C.P.* 4. 3. 5.

than in the cultivated kind, and, while in the latter the attachment of the leaf is flat, in the wild kind it is rounder, and the leaf itself has less angles; in other cases the wild form is the rougher[1] both in stem and leaf.

[2]The wild turnip has a long root, like that of the radish, and a short stem.

The wild lettuce has a shorter leaf than the cultivated kind, and, as the plant matures,[3] it becomes spinous; the stem is also shorter, while the juice is pungent and medicinal. It grows in fields; they extract its juice at the time of wheat-harvest, and it is said that it purges away dropsy and takes away dimness of sight and removes ulcers[4] on the eye; for which purpose it is administered in human milk.

[5]'Horse-celery' (alexanders) 'marsh-celery' and 'mountain-celery' (parsley) differ both from one another and from the cultivated kind; 'marsh-celery,' which grows by irrigation-ditches and in marshes, has scanty leaves,[6] and is not of close habit, [7]yet it somewhat resembles the cultivated kind in smell taste and appearance. 'Horse-celery' has a leaf like that of the marsh kind, but is of close habit and has a big stalk, and its root is as thick as a radish and black; [8]the fruit is also black, and in size is larger than the seed of a vetch. They say that both kinds are serviceable in cases of strangury and for those suffering from stone, being administered in sweet white wine. Both kinds grow equally[9]

[1] 9. 9. 5; Plin. 20. 58; Diosc. 2. 136.
[2] Plin. 19. 124.
[3] *μανόφυλλον*: Plin. *l.c.* seems to have read *μονόφυλλον*.
[4] Diosc. 3. 64. [5] Diosc. 3. 67.
[6] *δμοίως* conj. Sch.; *δμως* Ald.

ὁμοίως πανταχοῦ· γίνεται δὲ καί τι δάκρυον ἐξ αὐτοῦ ὅμοιον τῇ μύρρᾳ· οἱ δέ φασιν ὅλως μύρραν.

4 Τὸ δὲ ὀρεοσέλινον μείζους ἔτι διαφορὰς ἔχει· τὸ μὲν γὰρ φύλλον ἔοικε κωνείῳ, ῥίζα δὲ λεπτή, τὸν δὲ καρπὸν ἔχει καθάπερ ἄνηθον πλὴν ἐλάττω· διδόασι δὲ τοῦτον ἐν οἴνῳ αὐστηρῷ τῶν γυναικείων χάριν.

Ἕνια δὲ ὅλως ἀσύμβλητα τοῖς ἡμέροις ἐστὶ κατά γε τοὺς χυλοὺς καὶ τὰς δυνάμεις, ὥσπερ σίκυος ὅ τε ἄγριος καὶ ὁ ἥμερος, ἀλλ' ἐκ τῆς προσόψεως ἔχει τὴν ὁμοιότητα, καθάπερ καὶ ἐν τοῖς στεφανώμασιν ἡ ἰωνία· τὸ γὰρ φύλλον ἔχει παρόμοιον. τούτων μὲν οὖν ἐν τοῖς εἰρημένοις αἱ διαφοραί.

VII. Τῶν δὲ ἀρουραίων λεγομένων μετὰ ταῦτα ῥητέον, καὶ ὅλως εἴ τι ποιῶδές ἐστιν ὃ μὴ τυγχάνει βρωτόν. καλοῦμεν γὰρ λάχανα τὰ πρὸς τὴν ἡμετέραν χρείαν· ἐν δὲ τῷ καθ' ὅλου κἀκεῖνα περιέχεται, δι' ὃ καὶ περὶ ἐκείνων λεκτέον. λάχανα μὲν δὴ καὶ τὰ τοιαῦτα καλεῖται, κιχόρη ἀπάπη χόνδρυλλα ὑποχοιρὶς ἠριγέρων, καὶ ὅλως

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[1] τι conj. Sch.; τὸ Ald. *cf.* 9. 1. 4.
[2] ὅλως P_2Bas.; ὅλως Ald.; ? ἁπλῶς W.
[3] κωνείῳ conj. Sch.; κονίῳ Ald. *cf.* 1. 5. 3 n.
[4] καρπὸν conj. Cornarius on Diosc. 3. 67. and Dalec.; καυλὸν UMAld. *cf.* Diosc. *l.c.*
[5] ἡμέροις H.; εἰρημένοις UMAld. *cf.* 7. 6. 1 n.
[6] See Index, *σίκυος*.
[7] *i.e.* which gives them a common name.
[8] εἴ τι ποιωδές ἐστιν H.; ἐγγειποιῶδες U; ἐγγειποιῶδές ἐστι MAld.

everywhere. There is also a sort[1] of gum which exudes from the plant, like myrrh, and some say that it *is*[2] myrrh.

'Mountain-celery' (parsley) exhibits even greater differences; its leaf is like that of hemlock,[3] the root is slender, and the fruit[4] like that of dill, but smaller; it is given in dry wine for diseases of women.

In some cases however the wild kinds are not in the least like the cultivated[5] in taste and properties; thus the wild and the cultivated cucumber[6] are quite different, and their resemblance[7] is due only to their general look, as, among coronary plants, there is resemblance between the wild and the cultivated kinds of gilliflower; for the leaves are alike. We have then described the differences which these plants present.

Of other uncultivated herbs, which may be classed with pot-herbs.

VII. Next we must speak of the differences found in the herbs called 'uncultivated,' and in general in any herbaceous plants[8] which are not edible. For we give the name of 'pot-herbs' to those which are cultivated for our own use, but in a wider sense the term includes these also; wherefore we must speak of them too. [9]Under the name 'pot-herbs' are included also[10] such plants as chicory dandelion[11] *khondrylla*[12] cat's ear groundsel, and in general all

[9] Plin. 21. 89. [10] καὶ add. Scal.

[11] ἀπάπη (or ἀπάτη) conj. Sch.; ἀφάκη Ald. The latter is a leguminous plant mentioned 8. 5. 3, etc.: for ἀπάπη *cf.* 6. 4. 8; 7. 8. 3; 7. 11. 3; for spelling see notes on the last two passages.

[12] χόνδρυλλα conj. Salm. from Plin. *l.c.*, *cf.* 7. 11. 4 n.; ἀνδρύαλα Ald.G. *cf.* Plin. 21. 105; Diosc. 2. 133.

ὅσα κιχοριώδη καλεῖται διὰ τὴν ὁμοιότητα τῶν φύλλων· πάντα γάρ πως ἐμφερῆ ἔχει τῷ κιχορίῳ· πάλιν καυκαλὶς ἔνθρυσκον ἡδύοσμον. οἱ δὲ μυρία ἄλλα καλοῦσιν, σκάνδιξ καὶ ὅσα ἄλλα τοιαῦτα σκανδικώδη, τραγοπώγων, οἱ δὲ κόμην καλοῦσιν, ὃ τὴν μὲν ῥίζαν ἔχει μακρὰν καὶ γλυκεῖαν τὰ δὲ φύλλα τῷ κρόκῳ ὅμοια πλὴν μακρότερα, τὸν καυλὸν δὲ βραχύν, ἐφ' οὗ τὴν κάλυκα μεγάλην καὶ ἐξ ἄκρου μέγαν τὸν πάππον πολιόν, ἀφ' οὗ καλεῖται τραγοπώγων.

2 Ὁμοίως δὲ καὶ ὅσα ἄλλα τοιαύτας μὲν ἰδέας ἔχει τοὺς δὲ χυλοὺς ἐδωδίμους ἢ ὠμοὺς ἢ ἑφθούς· ἔνια γὰρ δεῖται πυρώσεως, ὥσπερ μαλάχη καὶ τευτλὶς καὶ τὸ λάπαθον καὶ ἡ ἀκαλύφη καὶ τὸ παρθένιον· τὸν δὲ στρύχνον καὶ ὠμὸν ἐσθίουσιν, ὃν καὶ εὐκήπευτόν τινες πρότερον . . . . καὶ ἕτερα δὲ πλείω τούτων, ἐν οἷς καὶ ὁ παροιμιαζόμενός ἐστι διὰ πικρότητα κόρχορος ἔχων τὸ φύλλον ὠκιμῶδες. πάντα δὲ τὰ μὲν ἐπέτεια τὰ δὲ ἐπετειόκαυλα τυγχάνει· τὰ μὲν γὰρ ἐξαναίνονται τῶν δὲ διαμένουσιν εἰς πλείω χρόνον αἱ ῥίζαι· σχεδὸν δὲ οὐκ ἐλάττω τὰ τοιαῦτά ἐστι.

3 Φύεται δὲ τὰ μὲν καὶ ἀπὸ τῶν ῥιζῶν καὶ ἀπὸ τῶν σπερμάτων, τὰ δὲ ἕτερα μόνον ἀπὸ σπέρ-

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[1] καλεῖται conj. Sch.; ταῦτα Ald.

[2] ἔνθρυσκον: Sch. conjectured ἔνθρυσκος, form corrected by L. Dindorf; ἐνθουσικόν Ald.G. *cf.* Plin. 22. 81.

[3] Plin. 27. 142; Diosc. 2. 138.

[4] κάλυξ: *cf.* 8. 2. 4; 8. 4. 3.

[5] πάππον conj. W.; παγητὸν UMAld.; πώγωνα H. *cf.* Diosc. *l.c.*, where Saracenus corrects καρπὸς to πάππος.

[6] τοιαύτας (sc. herbaceous) PmBas.; τοιαῦτα τὰς Ald.; τὰς αὐτὰς conj. W.

those that are called [1] 'chicory-like' because of the resemblance in the leaves; for to a certain extent the leaves of all these are like those of chicory; and we may add *kaukalis* chervil [2] green mint. Some include under the name countless others, as wild chervil and all plants that resemble it, and goat's beard,[3] which some call *kome* ('hair'), which has a long sweet root and leaves like those of the crocus, but longer, and a short stem, on which is set the sheath [4]; this is large, and on the top is the large mass of grey pappus,[5] from which it gets its name of 'goat's beard.'

In like manner all those may be included which have a similar [6] appearance, but juices suitable for food whether raw or cooked; for some need the action of fire, as *malakhe* (cheese-flower) beet monk's rhubarb nettle and bachelor's buttons; while garden nightshade [7] is also eaten raw, and some in former times [8] considered it worth growing in gardens. There are also many more, including the plant which has become proverbial [9] for its bitterness, blue pimpernel, which has a leaf like basil. All these are either annual or have annual stems; for some of them wither away altogether in one season, while of others the roots persist for a longer time, and to this class belong the majority.

Some of these plants grow from roots and also from seed—unless in some cases they come up

[7] *i.e.* *στρύχνος ὁ ἐδώδιμος*: *cf.* 7. 15. 4. The American 'wonder-berry.'

[8] *πρότερον* Ald.; **πρότερον* Bas.; *ὠνόμασαν* conj. W. Text probably defective.

[9] *κόρχορος ἐν λαχάνοις* is the proverb. *cf.* Ar. *Vesp.* 239, Schol.; Plin. 21. 183, (='Is Saul also among the prophets?')

ματος, εἰ μή τι καὶ αὐτόματον. ἡ δὲ βλάστησις καὶ τούτων καὶ τῶν ἄλλων τῶν μὲν ἅμα τοῖς πρώτοις ὑετοῖς ἐστι μετ' ἰσημερίαν, οἷον ἀπάπης καὶ τοῦ κύνωπος καὶ ἣν καλοῦσί τινες βούπρηστιν, τῶν δὲ μετὰ Πλειάδα, καθάπερ καὶ κιχορίου καὶ σχεδὸν τῶν ἄλλων τῶν κιχοριωδῶν. καὶ τὰ μὲν εὐθὺς ἅμα τῇ βλαστήσει τὸ ἄνθος ἀφίησι, καθάπερ ἡ ἀφία, τὰ δὲ ὕστερον οὐ πολλῷ, καθάπερ ἡ ἀνεμώνη, τὰ δὲ ἅμα τῷ ἦρι καὶ ἐκκαυλεῖ καὶ ἀνθεῖ, καθάπερ τὸ κιχόριον καὶ τὰ κιχοριώδη καὶ τῶν ἀκανθικῶν ὅσα λαχανώδη.

4 Διαφορὰ δὲ τῶν ἀνθῶν πολλή, περὶ ἧς ἐν τοῖς πρότερον εἴρηται· σχεδὸν γάρ ἐστι κοινὸν ἁπάντων· ἔνια δὲ καὶ ὅλως ἀνανθῆ, καθάπερ καὶ τὸ ἐπίπετρον. συμβαίνει δὲ τοῖς ἅμα τῷ καυλῷ τὸ ἄνθος ἀφιεῖσι ταχεῖαν εἶναι τὴν ἀπάνθησιν· πλὴν ἡ μὲν ἀπάπη γηράσαντος τοῦ πρώτου πάλιν ἄλλο καὶ ἄλλο παραφύει, καὶ τοῦτο ποιεῖ παρ' ὅλον τὸν χειμῶνα καὶ τὸ ἔαρ ἄχρι τοῦ θέρους. πολὺν δὲ χρόνον καὶ ὁ ἠριγέρων. τὰ δὲ ἄλλα οὐ ποιεῖ τοῦτο, καθάπερ οὐδὲ ὁ κρόκος οὔτε ὁ εὔοσμος οὔθ' ὁ λευκὸς οὐθ' ὁ ἀκανθώδης· οὗτοι δὲ ἄοσμοι.

VIII. Κοινὴ δὲ διαφορὰ πάντων τῶν ποιωδῶν ἡ τοιάδε· τὰ μὲν γάρ ἐστιν ὀρθόκαυλα καὶ νευρό-

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[1] δὲ after *τούτων* om. W.

[2] *ἀπάπης* (or *ἀπάτης*) conj. Sch.; *ἀφάκης* U; *ἀφάκεις* MAld. *cf.* 7. 7. 1 n. Plin. *l.c.*, however, has *aphace*.

[3] *ἐπίπετρον* conj. Scal. from Plin. *l.c.*; *ἐπίμετρον* UMAld.G. *cf.* Hesych.

[4] *καυλῷ* conj. Sch.; *καρπῷ* UMAld.G.

spontaneously. The growth alike of these[1] and of others takes place in some cases with the first rains after the equinox, for instance, dandelion[2] rib-grass and the plant which some call *buprestis*; in other cases after the rising of the Pleiad, for instance, chicory and most of the plants of that class. Some produce their flower immediately at the time of making growth, as lesser celandine, some not long after, as anemone, while some as soon as spring comes send up both their stems and flower, as chicory and the plants which resemble it, and those spinous plants which come under the head of pot-herbs.

There is much difference in the flowers, of which we have spoken already; for such difference is a thing common to all; and some are altogether flowerless, as stonecrop.[3] Those which produce their flower with the stem[4] quickly shed the flower; except that dandelion,[5] when the first flower is past its prime, produces another and yet another, and continues to do so right through the winter and spring up to the summer. Groundsel[6] also blooms for a long time; the others however do not do this; for instance the crocus does not, neither the scented (saffron crocus) nor the white nor the spinous kind,[7]—which last are scentless.

Of the differences in stem and leaf found in all herbaceous plants.

VIII. A distinction which is found in all herbaceous plants alike is the following:—some have straight

[5] *ἀπάπη γηρήσαντος* conj. W.; *ἀπηγηράσαντος* U; *ἀπογηράσαντος* MAld.; *ἀφάκη ἀπογηράσαντος* H. *cf.* Plin. *l.c.*; 7. 7. 1 n.

[6] *cf. C.P.* 1. 22. 4; Plin. 25. 106.

[7] See Index. This plant can only have been called *κρόκος* because it produced a yellow dye.

καυλα, τὰ δὲ ἐπιγειόκαυλα, καθάπερ μαλάχη σκάνδιξ σίκυος ἄγριος· τὸ δὲ ἡλιοτρόπιον ἔτι μᾶλλον ὡς εἰπεῖν τοιοῦτον, ὥσπερ καὶ ἐν τοῖς ἀκανθώδεσιν οὖσιν τρίβολος καὶ ἡ κάππαρις καὶ ἄλλα πλείω· καὶ γὰρ ἐκείνων ἡ διαφορὰ πλείων. ἔνια δὲ περιαλλόκαυλα, μὴ ἔχοντα δὲ ποῦ προσπέσωσιν ἐπιγειόκαυλα, καθάπερ ἐπετίνη καὶ ἀπαρίνη καὶ ἁπλῶς ὧν ὁ καυλὸς λεπτὸς καὶ μαλακὸς καὶ μακρός, δι' ὃ καὶ φύονται ταῦτα ὡς ἐπὶ τὸ πᾶν ἐν ἄλλοις· κοινὴ δὴ καὶ αὕτη ἡ διαφορὰ πάντων οὐ μόνον τῶν ποιωδῶν καὶ φρυγανικῶν ἀλλὰ καὶ τῶν θαμνωδῶν· καὶ γὰρ ἡ ἕλιξ καὶ ἔτι μᾶλλον ἡ σμίλαξ περιαλλόκαυλον.

2 Ἔτι δὲ καὶ τῶν ποιωδῶν τὰ μὲν πολύκαυλα τὰ δὲ μονόκαυλα· καὶ τῶν μονοκαύλων τὰ μὲν ἀπαράβλαστα κατὰ τὸν καυλὸν τὰ δὲ παραβλαστικά, καθάπερ καὶ ἐν τοῖς ἡμέροις ἥ τε ῥαφανὶς καὶ ἄλλ' ἄττα. πολύκαυλα δὲ ὡς ἁπλῶς εἰπεῖν τὰ ἐπιγειόκαυλα, μονόκαυλα δὲ καὶ ὀλιγόκαυλα τὰ ὀρθόκαυλα. τούτων δὲ ἀπαράβλαστα τὰ λειόκαυλα κρόμυον πράσον σκόροδον, ὥσπερ καὶ ἐν τοῖς ἡμέροις καὶ τὰ μὲν εὐθύκαυλα τὰ δὲ σκολιόκαυλα καὶ τούτων [τοῖς ἡμέροις] ὑπάρχει.

3 Διαφορὰ δέ τις καὶ τοιάδε τῶν ποιωδῶν ἐστι· τὰ μὲν γὰρ ἐπιγειόφυλλα τὰ δ' ἐπικαυλόφυλλα τυγχάνει τὰ δ' ἀμφοτέρως. ἐπιγειόφυλλα μὲν

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[1] ἐπιγειόκαυλα conj. Cornarius; ἐπετειόκαυλα Ald. H.
[2] *cf.* 7. 15. 1; Diosc. 4. 190 and 191; Plin. 22. 57.

and fibrous stems, some prostrate stems,[1] as *malakhe* (cheese-flower) wild chervil 'wild cucumber' (squirting cucumber); while *heliotropion*[2] has this character[3] to an even greater extent, and so, among spinous plants, have caltrop caper and several others; for in these too the above-mentioned distinction is even more marked. Some again have clasping stems, but if they have nothing on which to throw themselves, their stems become prostrate, as *epetine* bedstraw and in general those which have a slender soft long stem; wherefore these in general grow in the midst of[4] other plants. This point of difference too is common not only to all herbaceous plants and under-shrubs, but also to shrubby ones; for *helix* (ivy) has a clasping stem, and, still more, smilax.

Again of herbaceous plants too some have several stems, some only one; and of the latter some have no side-shoots along the stem, while others have side-shoots, for instance, among cultivated plants radish and some others. Those with prostrate stems have generally more than one, while those with erect stems have but one or a few. Of these those with smooth stems have no side-shoots, as onion leek garlic—the wild, as well as the cultivated forms; and of these[5] again some have straight, some crooked stems.

There is also the following point of difference in herbaceous plants:—some have their leaves on the ground, some on the stem, some have both characters. The following have ground leaves—crowsfoot[6] the

[3] *τοιοῦτον* conj. Sch. from G; *τούτων* Ald.
[4] *ἐν*; G seems to have read *ἐπ'*.
[5] *τοῖς ἡμέροις* probably repeated by mistake from above.
[6] *cf. C.P.* 2. 5. 4; Plin. 22. 48; Diosc. 2. 130.

κορωνόπους ἄνθεμον ἀφύλλανθες[1] ἄγχουσα πόα ἀνεμώνη ἀπαργία ἀρνόγλωσσον ἀπάπη[2] ἐπικαυλόφυλλα δὲ κρηπὶς ἄνθεμον τὸ φυλλῶδες λωτὸς λευκόϊον· ἀμφοτέρως δὲ τὸ κιχόριον· καὶ γὰρ ἐπὶ τῶν καυλῶν ἅμα ταῖς ἐκφύσεσι ταῖς ἀκρεμονικαῖς ἐκφύει τι καὶ ἄνθος· καὶ τῶν φυλλακάνθων ἔνια, πλὴν ἀκανθώδεσι κομιδῇ, καθάπερ ὁ σόγκος.

IX. Ἔστι δὲ καὶ τὰ μὲν ἄκαρπα τὰ δὲ κάρπιμα. καὶ ὅλως τῶν ποιωδῶν τὰ μὲν ἄχρι τῶν φύλλων ἀφικνεῖται, τὰ δὲ καυλὸν ἔχει καὶ ἄνθος καρπὸν δὲ οὔ. τὰ δὲ καὶ καρπὸν ὥσπερ τελειοτάτην φύσιν, εἰ μή τι καὶ ἄνευ τοῦ ἄνθους καρποφόρον, ὥσπερ ἐπὶ τῶν δένδρων.

Διαφέρει δὲ καὶ τὰ φύλλα σχεδὸν οὐκ ἐλάττοσιν ἀλλὰ πλείοσι διαφοραῖς ἢ τὰ τῶν δένδρων· καὶ πρὸς αὐτὰ δὲ ἐκεῖνα διαφορὰς ἔχει· μεγίστην μὲν ὡς εἰπεῖν ὅτι τὰ μὲν ἀπὸ μίσχου προσπέφυκε, τὰ δὲ αὐτὰ μὲν ὡς ἁπλῶς, τὰ δὲ καυλικῇ τινι προσφύσει. καὶ τῶν μὲν ἐν τῇ βλαστήσει προτερεῖ <ὁ καυλός>, τῶν δὲ πλείστων τὰ φύλλα, καὶ σχεδὸν ἐν τῇ ἀρχῇ μέγιστα γίνονται καὶ μάλιστα ἐδώδιμα· τὰ δὲ ἐκ τῶν δένδρων προωθεῖ τινα καυλόν.

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[1] ἀφύλλανθες placed after ἄνθεμον by Sch.; in Ald. placed after ἀνεμώνη. *cf.* 7. 14. 2; Plin. 21. 56.

[2] ἀπάπη U; ἀπάτη Ald. *cf.* 7. 7. 1 n.

[3] *cf.* 1. 13. 1. and Index.

[4] ἐκφύει τι καὶ MSS.; ? ἐκφύει φύλλον τε καὶ W.

anthemon whose flowers have no petals[1] (wild camomile) alkanet grass anemone hawk's beard plantain dandelion[2]; the following have leaves on the stem—ox-tongue the *anthemon* which has petalled flowers[3] trefoil gilliflower; while chicory has both kinds of leaves; for this plant produces,[4] as well as leaves, a certain number of flowers on the stems at the points where the side-shoots are attached. Similar too are some of the plants with spinous leaves, but not those that are altogether spinous, as sow-thistle.

Of other differences seen in herbaceous plants in general, as compared with one another and with trees.

IX. Again some are barren, while others bear fruit, and, speaking generally, of herbaceous plants some get as far as producing leaves only, others have a stem and flower, but no fruit; some again have fruit as the completion of their development, while some bear fruit even though they have no flower, as is the case with some trees.

[5] The leaves of herbaceous plants again differ in hardly fewer, nay, even in more, ways than those of trees, and further, they present differences as compared with these, the chief being perhaps that some are attached by a leaf-stalk, some are attached directly, some attached with cauline appendages.[6] And in some herbaceous plants the stalk[7] is the first part to grow, but in most the leaves, which almost at the outset grow to their largest and are best for eating; whereas the leaves of trees always push out first a sort of stalk.

[5] Plin. 21. 100.

[6] *i.e.* petiolate, sessile, and decurrent respectively.

[7] *ὁ καυλὸς* add. Sch. from G.

2 Διαφέρουσι δὲ καὶ τοῖς ἄνθεσι πολύ· ἐν μὲν γὰρ τοῖς δένδρεσι τά γε πλεῖστα λευκά, τὰ δὲ μικρὸν ἐπιπορφυρίζοντα, τὰ δὲ ποώδη καὶ χλοώδη, κεχρωσμένον δὲ ἀνθινῷ <οὐδέν· ἐν δὲ τοῖς ποιώδεσι τῶν ἀνθῶν> πολλαὶ καὶ παντοδαπαὶ χροιαὶ καὶ ἄκρατοι καὶ μεμιγμέναι καὶ εὔοσμοι δὴ καὶ ἄοσμοί εἰσιν. καὶ τὰ μὲν δένδρα τὴν ἄνθησιν ἀθρόαν ποιεῖται, τούτων δ' ἕνια κατὰ μέρος, ὥσπερ ἐλέχθη καὶ περὶ τοῦ ὠκίμου, δι' ὃ καὶ πολὺν χρόνον ἀνθεῖ, καθάπερ ἄλλα τε πολλὰ καὶ τὸ ἡλιοτρόπιον καὶ τὸ κιχόριον.

3 Πολλαὶ δὲ καὶ τῶν ῥιζῶν διαφοραὶ καὶ τρόπον τινὰ αἱ τούτων φανερώτεραι· εἰσὶ γὰρ αἱ μὲν ξυλώδεις αἱ δὲ σαρκώδεις καὶ ἰνώδεις, ὥσπερ καὶ τῶν ἡμέρων, καθάπερ αἵ τε τοῦ σίτου καὶ τῆς πόας τῆς πλείστης. αὐτῶν δὲ τούτων ἕκασται πλείστας ἔχουσι διαφορὰς χρώμασιν ὀσμαῖς χυμοῖς μεγέθεσιν· αἱ μὲν γὰρ λευκαὶ αἱ δὲ μέλαιναι αἱ δ' ἐρυθραί, καθάπερ ἥ τε τῆς ἀγχούσης καὶ τοῦ ἐρευθεδάνου· αἱ δ' ὥσπερ ξανθαὶ καὶ ξυλοειδεῖς· καὶ γλυκεῖαι δὲ καὶ πικραὶ καὶ δριμεῖαι καὶ εὐώδεις καὶ κακώδεις, καὶ ἔνιαι φαρμακώδεις, ὡς ἐν ἄλλοις εἴρηται.

4 Διαφοραὶ δὲ καὶ τῶν σαρκωδῶν· αἱ μὲν γὰρ στρογγύλαι αἱ δὲ προμήκεις καὶ βαλανώδεις, ὥσπερ ἀσφοδέλου καὶ κρόκου· καὶ αἱ μὲν λεπυριώδεις, ὥσπερ ἡ τοῦ βολβοῦ καὶ τῆς σκίλλης καὶ ὅσαι βολβώδεις καὶ κρομύου δὲ καὶ γηθύου καὶ

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[1] *cf.* 1. 13. 1.

[2] οὐδὲν . . . ἀνθῶν add. Scal. from G (κεχρωσμένων δὲ ἀνθικῷ πολλαὶ UMAld.); ἀνθινῷ for ἀνθικῷ conj. W., who also added τῶν ἀνθῶν. See LS. ἀνθινός.

There is also much difference as to the flowers between herbaceous plants and trees; for in trees[1] most of the flowers are white, while some are slightly reddish, others are greenish or greenish-yellow, but none of them[2] have distinct gay colours; while in herbaceous plants the flowers shew many and various colours, both simple and in combination, and further, some of them are scented, others not. Again[3] trees produce all their bloom at once, while some herbaceous plants have a succession of flowers, as we said[4] of basil; wherefore it is in flower for a long period, as are many other herbs, such as *heliotropion* and chicory.

There are also many differences in the roots, and, in a way, the differences in these are more obvious; some are woody, some fleshy and fibrous, just as in the cultivated kinds, as are those of corn and most kinds of grass. Again the roots themselves exhibit in each case very many differences in colour smell taste and size; some are white, some black, some red, as those of alkanet and madder; some are yellowish,[5] or the colour of wood.[6] Again there are roots which are sweet, bitter, pungent, fragrant, evil-smelling; and some are medicinal, as has been said elsewhere.

There are also differences between those with fleshy roots; the roots of some are round, of some oblong and acorn-shaped, as those of asphodel and crocus;[7] some consist of several layers, as those of purse-tassels squill and others which belong to that class, onion long onion and others like

[3] ἄοσμοι εἰσιν. καὶ τὰ μὲν conj. W.; ἄοσμοι. καὶ ἐνίων τὰ μὲν Ald. H. [4] 7. 3. 1.

[5] ὥσπερ MSS.; πλεῖσται conj. W.

[6] ξυλοειδεῖς: *cf.* 7. 3. 2. [7] *cf.* 1. 6. 7; 6. 6. 10.

ὅσα τούτοις ὅμοια. αἱ δὲ ὁμαλεῖς καὶ ψαθυραὶ καὶ μαλακαὶ δι' ὅλου καὶ ὥσπερ ἄφλοιοι, καθάπερ τοῦ ἄρου· αἱ δὲ φλοιὸν ἔχουσι πρὸς τῇ σαρκί, καθάπερ ἡ τοῦ κυκλαμίνου καὶ τῆς γογγυλίδος. οὐχ ἅπασαι δ' αἱ εὐώδεις ἢ γλυκεῖαι ἢ εὔστομοι καὶ ἐδώδιμοι, οὐδ' αἱ πικραὶ ἄβρωτοι· ἀλλ' ὅσαι ἀβλαβεῖς εἰσι τῷ σώματι μετὰ τὴν προσφοράν· ἔνιαι γὰρ γλυκεῖαι μὲν θανάσιμοι δὲ καὶ νοσώδεις, αἱ δὲ πικραὶ μὲν ἢ κακώδεις ὠφέλιμοι δέ. τὸν αὐτὸν δὲ τρόπον καὶ φύλλα καὶ καυλοί, καθάπερ τοῦ ἀψινθίου καὶ τοῦ κενταυρίου. διαφορὰ δὲ καὶ κατὰ τὴν βλάστησιν καὶ κατὰ τὴν ἄνθησιν, οἷον ἀρχομένου χειμῶνος καὶ μεσοῦντος καὶ πάλιν ἦρος ἢ θέρους ἢ μετοπώρου. καὶ ἐπὶ τῶι καρπῶν δὲ ὁμοίως τῷ βρωτοὺς εἶναι καὶ ἐγχύλους ἐνίοις καὶ φύλλα καὶ σπέρματα καὶ ῥίζας· καὶ ἐν αὐτοῖς τούτοις κατὰ τοὺς χυλούς, οἷον ὀξύτητι καὶ δριμύτητι καὶ γλυκύτητι καὶ αὐστηρότητι καὶ ταῖς ἄλλαις ταῖς τοιαύταις ἁπλῶς τε καὶ κατὰ τὸ μᾶλλον. τὰς μὲν οὖν διαφορὰς ἐν τούτοις ληπτέον.

X. Διῃρημένων δὲ κατὰ τὰς ὥρας ἑκάστων πρός τε τὰς βλαστήσεις καὶ κατὰ τὰς ἀνθήσεις καὶ τελειώσεις τῶν καρπῶν, οὐδὲν ἀναβλαστάνει πρὸ τῆς οἰκείας ὥρας οὔτε τῶν ῥιζοφυῶν οὔτε τῶν σπερμοφυῶν, ἀλλ' ἕκαστον ἀναμένει τὴν

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[1] καὶ conj. W.; ἢ Ald.

[2] τῷ βρωτοὺς εἶναι καὶ ἐγχύλους ἐνίοις conj. W.; τὸ βρωτὰ εἶναι καὶ καυλοὺς εἶναι Ald.H. Text probably defective.

these. Some are smooth loose and soft throughout, and, as it were, without 'bark,' as those of cuckoo-pint, while some have a 'bark' attached to the fleshy part, as those of cyclamen and turnip. And not all those that are fragrant or sweet or pleasant to the taste are also[1] edible, any more than all those that are bitter are uneatable; any (whether sweet or bitter) that are harmless to the body after being eaten are edible; for some that are sweet are deadly and dangerous to health, while some are beneficial even if they are bitter or have an evil smell. The same may be said of the leaves and stalks, as in the case of wormwood and centaury. There are also differences in the time of growth and of flowering, the season being variously the beginning or middle of winter, or again spring, summer, or autumn. So too is there in like manner a difference in the fruits, which[2] in some of these plants are edible and juicy, as well as[3] the leaves seeds and roots. And in these cases there are further differences in the taste (of those which are edible and juicy), which may be sharp, pungent, sweet, dry, or exhibit other similar differences, either altogether or in degree. These are examples of the differences which we find.

Of the seasons at which herbs grow and flower.

X. Each plant having its proper season for growth, flowering and maturing of the fruit, nothing grows[4] before its proper season either of those grown from a root or of those grown from seed, but each awaits

[3] καὶ ῥίζας seems irrelevant.
[4] ἀναβλαστάνει conj. W.; ἀναβλαστεῖ καὶ Ald. H.

οἰκείαν οὐδ' ὑπὸ τῶν ὑδάτων οὐδὲν πάσχον· ἔνια γὰρ θερινὰ κομιδῇ καὶ τῇ βλαστήσει καὶ τῇ ἀνθήσει, καθάπερ ὅ τε σκόλυμος καὶ ὁ σίκυος ἄγριος, ὥσπερ καὶ περὶ τῶν φρυγανικῶν ἐλέχθη περὶ κονύζης τε καὶ καππάριδος καὶ τῶν ἄλλων· οὐδὲν γὰρ οὐδὲ ἐκείνων ἀνθεῖ καὶ βλαστάνει πρὸ
2 τῆς οἰκείας ὥρας. δι' ὃ κἂν ταύτῃ δόξαιεν ἂν διαφέρειν τῶν δένδρων. τῶν μὲν γὰρ ἅμα πως πάντων ἡ ἐγγὺς ἡ βλάστησις, εἰ δὲ μὴ κατὰ μίαν γε ὥραν ὡς εἰπεῖν· τούτων δὲ ἐν πολλαῖς μᾶλλον δὲ ἐν ἁπάσαις ἡ βλάστησις καὶ ἔτι μᾶλλον ἡ ἄνθησις, ὥστε εἴ τις ἐθέλει κατανοεῖν σχεδὸν συνεχὴς γίνεται καθ' ὅλον ἐνιαυτὸν καὶ ἡ βλάστησις καὶ ἡ ἄνθησις· αἰεὶ γὰρ ἕτερον ἐξ ἑτέρου διαδεχόμενον πάσας καταλαμβάνει τὰς ὥρας· οἷον μετὰ τὴν ἀπάπην κρόκος ἔσται καὶ ἀνεμώνη καὶ ὁ ἠριγέρων καὶ τὰ ἄλλα χειμερινά, μετὰ δὲ ταῦτα τὰ ἠρινὰ <καὶ θερινὰ> καὶ μετοπωρινά.
3 πολλὰ δέ, ὥσπερ ἐλέχθη, διὰ τὸ κατὰ μέρος ἀνθεῖν ἐπιτείνεται ταῖς ὥραις· ἔνια γὰρ οὕτως ἀνθεῖ, καθάπερ ἥ τε ἀπάπη καὶ τὸ ὀνοχειλὲς καὶ τὸ κιχόριον καὶ τὸ ἀρνόγλωσσον καὶ ἄλλα· διὰ δὲ τὴν συνέχειαν καὶ τὴν περικατάληψιν τὴν ὑπ' ἀλλήλων οὐ φαίνεται ῥᾴδιον ἐν ἐνίοις οὐδ' ὁρίσαι ποῖα πρῶτα βλαστάνει καὶ ποῖα ὀψιβλαστῆ· πλὴν εἴ τις ὑποθοῖτο τοῦ ἔτους τὴν ἀρχήν τινα

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[1] *οὐδ'* conj. W.; *οὔθ'* Ald. [2] Reference not discoverable.
[3] *ἀπάπην* conj. W.; *ἀφάκην* UMAld. *cf.* 7. 7. 1 n.
[4] *κρόκος* conj. Sch. (adding *ὁ*); *ἧρος* U (corrected); *κρος* M; om. Ald.; *τὸ κρόκον* mBas.
[5] *καὶ θερινὰ* seems to have dropped out.
[6] *διὰ τὸ κατὰ μέρος ἀνθεῖν* conj. W.; *καὶ τῶν κατὰ μέρος ἀνθέων* Ald.

its proper season and is not[1] affected even by rain. For some are plants which belong properly to summer as to their growth and their flowering, as golden thistle and squirting cucumber, as was said[2] of shrubby plants and of *konyza* caper and the rest; for of these too none blooms or grows before its proper season. Wherefore in this respect too these plants would seem to differ from trees. For trees make their growth all at once or nearly so, or at all events we may say that they do so all at one season; but the plants of which we are now speaking have their times of growing and still more of flowering at many or rather at all seasons; so that, if one will consider it, both the growing and the flowering are almost continuous throughout the year; for one continually succeeds to another, so that all seasons are covered; thus after the dandelion[3] will come the crocus[4] anemone groundsel and the other plants of winter, and after these those of spring summer[5] and autumn. Some again, as was said, because they do not produce all their bloom at once,[6] cover a longer season; for there are some that thus bloom, for instance dandelion[7] bugloss[8] chicory plantain, and others; but because of this continuity and overlapping it does not seem easy in some cases to define which first make growth and which are late in growing,—unless[9] one were to lay down that the 'year'

[7] ἀπάπη conj. W.; ἀφάκη Ald. *cf.* 7. 7. 1 n.

[8] ὀνοχειλὲς conj. Sch. from Plin. 21. 100; Diosc. 4. 24; ὀνοκίχλης UMAld.

[9] *i.e.* unless one has a fixed starting-point. τινα ὥρας τινος ἀρχῇ conj. W.; τινα πρὸς τῇ ἵνα ζῇ(?) U; text defective in MAld., but both give ἵνα ζῇ; W. conjectures also τροπὰς τὰς χειμερινάς. ? εἶναι ὥρας τινος ἀρχήν or εἶναι ὥραν τινα (omitting εἰ ζῇ as a trace of a lost sentence).

4 ὥρας τινὸς ἀρχῇ. καὶ αὐτῶν δὲ τούτων τὰς γενέσεις καὶ τὰς ὥρας ὅταν τελειωθέντων τῶν καρπῶν πάλιν ἄλλας ἀρχὰς ἐνίστωνται τῆς γενέσεως· ὅπερ μάλιστα δοκεῖ συμβαίνειν μετ' ἰσημερίαν μετοπωρινήν· τότε γὰρ ἤδη τὰ σπέρματα πλεῖστα τετελείωται καὶ τῶν δενδρικῶν καρπῶν οἱ πολλοί, καὶ ἅμα μεταβολή τις αὐτοῦ τούτου προσγίνεται καὶ τῆς ὥρας· ὅσα δὲ ἀτελῆ καὶ ἄπεπτα περικαταλαμβάνεται, τούτοις κατὰ λόγον ἐκ περιόδου καὶ ἡ βλάστησις γίνεται καὶ ἡ ἄνθησις καὶ ἡ τελείωσις· δι' ὃ συμβαίνει τὰ μὲν ὑπὸ τροπὰς ἀνθεῖν τὰ δ' ὑπὸ Κύνα τὰ δὲ καὶ μετὰ Ἀρκτοῦρον καὶ ἰσημερίαν μετοπωρινήν.

5 Ἀλλὰ ταῦτα μὲν ἔοικε κοινοτέραν ἔχειν σκέψιν εἰς ἀφορισμὸν ἀρχῆς. ὅτι δὲ αἱ διαφοραὶ πλείους ἢ οὐκ ἐλάττους ἐν τούτοις φανερόν. ἐπεὶ καὶ ἀείφυλλα τῶν τοιούτων ἐστὶν ἔνια, καθάπερ τὸ πόλιον καὶ ἡλιοτρόπιον καὶ τὸ ἀδίαντον.

XI. Ἀφωρισμένων οὖν τούτων περὶ τὰς διαφορὰς ἐν οἷς γίνονται καὶ πῶς λεκτέον ἤδη τὰς καθ' ἕκαστον ἱστορίας . . . ὅσα μὴ κατὰ τὴν

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[1] *i.e.* to fix the date of the beginning and end of the cycle of the plant's life.

[2] *αὐτοῦ τούτου*: ? the plant itself. *αὐτοῦ τοῦ ἔτους* conj. Sch.

[3] *i.e.* according as the seed ripened last year or this year. In this rather obscure section I follow W.'s explanations.

[4] Plin. 21. 100.

begins when a certain season begins. Further in these plants it is not easy to define [1] in each case the time of first growth and the season when, the fruits being matured, it makes a fresh start in reproduction. This seems chiefly to occur after the autumnal equinox; for by that time most of the seeds are matured, like most of the fruits of trees: moreover a change then takes place in the seed [2] itself as well as in the season. But in the case of any seeds which are still immature and unripe and so are overtaken by winter, the period of first growth, the flowering of the new plant, and the period of maturity are proportionally later. Wherefore it comes to pass that some bloom at the solstice, some at the rising of the dog-star, and some after the rising of Arcturus and the autumnal equinox.[3]

But these matters seem to require a wider investigation in order to determine when the process begins. However it is clear from what has been said that these plants present at least as many differences as trees. [4] For some again of this class are evergreen, as hulwort *heliotropion* and maidenhair.

Of the classes into which herbaceous plants may be divided, as those having a spike and chicory-like plants.

XI. Having then made these explanations we must now give a separate account of each plant, discussing the differences (in those plants in which they occur) and saying how they arise . . . .[5] except those peculiarities which belong to the

[5] Lacuna in UMAld.Cam.Bas., leaving the connexion of the next clause obscure.

ἰδίαν ἑκάστου φύσιν. λέγω δὲ οἷον τὰ σταχυώδη καὶ τὰ σκανδικώδη καὶ μονοφυῆ, κἂν εἴ τι ἕτερόν ἐστι τοιοῦτον κοινὸν ἐπὶ πάντων λαβεῖν, ὁ τῇ αἰσθήσει γνώριμον ἢ φύλλοις ἢ ἄνθεσιν ἢ ῥίζαις ἢ καρποῖς· ἐκ γὰρ τῶν φανερῶν ὁ μερισμὸς ὥσπερ καὶ ἐκ τῶν ῥιζῶν.

2 Σταχυώδη μὲν οὖν ἐστιν ὅ τε κύνωψ ὑπό τινων καλούμενος πλείους ἔχων ἰδέας ἐν ἑαυτῷ· καὶ ὁ ἀλωπέκουρος καὶ ὁ στελέφουρος ὑπ' ἐνίων δὲ ἀρνόγλωσσον τῶν δὲ ὄρτυξ καλούμενος· παρόμοιον δὲ τούτῳ τρόπον τινὰ καὶ ἡ θρυαλλίς. ἁπλᾶ δὲ καὶ μονοειδῆ τρόπον τινὰ ταῦτα καὶ στάχυν οὐκ ὀξὺν οὐδ' ἀθερώδη ἔχοντα· ὁ δ ἀλωπέκουρος μαλακὸν καὶ χνοωδέστερον, ὅτι καὶ ὅμοιον ταῖς τῶν ἀλωπέκων οὐραῖς, ὅθεν καὶ τοὔνομα μετείληφεν. ὅμοιος δὲ τούτῳ καὶ ὁ στελέφουρος, πλὴν οὐχ ὥσπερ ἐκεῖνος ἀνθεῖ κατὰ μέρος ἀλλὰ δι' ὅλου τοῦ στάχυος ὥσπερ ὁ πυρός. ἡ δὲ ἄνθησις ἀμφοῖν χνοώδης, καθάπερ καὶ τοῦ σίτου· παρόμοιον δὲ τῇ ὅλῃ μορφῇ τῷ πυρῷ πλὴν πλατυφυλλότερον. ὡσαύτως δὲ τούτοις καὶ τὰ ἄλλα τὰ σταχυώδη λεκτέον.

3 Τὰ δὲ κιχοριώδη πάντα μὲν ἐπετειόφυλλα καὶ ῥιζόφυλλα, βλαστάνει δὲ μετὰ Πλειάδα πλὴν τῆς ἀπάπης, τοῖς δὲ καυλοῖς καὶ ταῖς ῥίζαις

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[1] *i.e.* spicate.

[2] *σκανδικώδη* : *i.e.* umbellate. One would expect *κιχοριώδη*, to correspond with § 3 ; but the three classes mentioned seem to be merely 'samples' of classification : of the three only one (*τὰ σταχυώδη*) is described below, and other classes are added.

[3] *μονοφυῆ* I conj.: *i.e.* those which have a scape : *cf.* 2. 6. 9 ; *C.P.* 1. 1. 3. *μυόφαα* U ; *μυοφῶα* MAld. ; om. G.

character of individual kinds. I mean for instance the plants which have a spike,[1] those which may be classed with wild chervil,[2] and those which have a single stem,[3] . . . . or any other such class in which one can find some such general characteristics obvious to the senses either in leaves flowers roots or fruits; (for the classification is to be made by the visible parts, as well as by the roots).[4]

[5] An example of the plants which have a spike is the plant which some call 'dog's eye[6]' (rib-grass), which comprises several forms; we have also 'fox-brush,' *stelephuros* (plantain), which some call 'lamb's tongue' and some 'quail-plant'; and somewhat similar to this is *thryallis*. These are simple plants and uniform in character, having a spike which is not pointed nor bearded; while in 'fox-brush' it is soft and somewhat downy, in that it actually resembles the brush of a fox, whence also it has obtained its name. Similar to this is *stelephuros* (plantain), except that it does not, like that plant, flower here and there, but all up the spike like wheat. The bloom of both is downy like that of corn, and the plants in their general appearance resemble wheat, but have broader leaves. Of the other plants which have a spike a similar account may be given.

[7] The chicory-like plants all have annual leaves and have root-leaves, and they begin to grow after the Pleiad, except dandelion[8]; but in their stems

[4] Roots being the basis of classification in xii. below.
[5] Plin. 21. 101.
[6] κύνωψ conj. Sch.; ἀχύνωψ UAld.; Plin. *l.c.* has *cynops* (*cf.* 7. 7. 3); *oculus caninus* G.
[7] *i.e.* composites. Plin. *l.c.*
[8] ἀπάπης U; ἀπάτης MAld. *cf.* 7. 7. 1 n.; 7. 8. 3 n.

μεγάλας ἔχουσι διαφοράς· οἱ μὲν γὰρ τῶν ἄλλων ἁπλούστεροι καὶ ἐλάττους, ὁ δὲ τοῦ κιχορίου μέγας καὶ ἀποφύσεις ἔχων πολλάς, ἔτι δὲ γλίσχρος καὶ δυσδιαίρετος, δι' ὃ καὶ δεσμῷ χρῶνται· παραβλαστητικὸν δὲ καὶ τῇ ῥίζῃ καὶ ἄλλως μακρόρριζον, δι' ὃ καὶ δυσώλεθρον· ὅταν γὰρ ἐκλαχανίσωνται, πάλιν τὸ ὑπόλοιπον ἀρχὴν λαμβάνει γενέσεως. συμβαίνει δὲ καὶ παρανθεῖν αὐτοῦ μέρος ἄλλο καὶ ἄλλο, καὶ τοῦτο ἄχρι τοῦ μετοπώρου, σκληροῦ δοκοῦντος εἶναι τοῦ καυλοῦ. φέρει δὲ καὶ λοβὸν ἐν ᾧ τὸ σπέρμα περὶ τὰ ἄκρα τῶν καυλῶν.

4 Ἡ δὲ ὑποχοιρὶς λειοτέρα καὶ ἡμερωτέρα τῇ προσόψει καὶ γλυκυτέρα καὶ οὐχ ὥσπερ ἡ χόνδρυλλα· τὸ γὰρ ὅλον οὐκ ἐδώδιμος αὕτη καὶ ἄβρωτος καὶ ἐν τῇ ῥίζῃ δριμὺν ὀπὸν ἔχει καὶ πολύν.

Ἄβρωτος δὲ καὶ πικρὰ ἡ ἀπάπη· πρωϊανθὴς δὲ καὶ ταχὺ γηράσκει καὶ ἀποπαπποῦται, εἶτ' ἄλλο φύεται πάλιν καὶ ἄλλο καὶ τοῦτο παρ' ὅλον ποιεῖ τὸν χειμῶνα καὶ τὸ ἔαρ ἄχρι τοῦ θέρους· τὸ δ' ἄνθος μηλινοειδές.

Ὡσαύτως δὲ καὶ ἡ πικρίς· καὶ γὰρ αὕτη τῷ ἦρι ἀνθεῖ, καὶ παραπλησία δι' ὅλου τοῦ χειμῶνος καὶ τοῦ θέρους παρανθεῖ· τῇ γεύσει δὲ πικρά, δι' ὃ καὶ τοὔνομα εἴληφε. ταῦτα μὲν οὖν ἐν ταύ-

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[1] ἐλάττους conj. Scal.; θάττους UMAld.
[2] Plin. 21. 88. [3] τὸ conj. Sch.; τὴν Ald.
[4] Meaning not obvious; σκληροῦ is perhaps corrupt.
[5] ὑποχοιρὶς conj. Scal.; ὑποχώρησις UMAld. *cf.* 7. 7. 1 n.
[6] οὐχ ὥσπερ : an adjective has perhaps dropped out between these words; ? πικρὰ (*amara* Plin. *l.c.*).

and roots they exhibit great differences; for in some these are simpler and fewer,[1] but the stem of chicory is large and has many side-shoots; also it is tough and hard to break, wherefore it is used for withes[2]; it makes side-growths from the root, and also has long roots, wherefore it is hard to kill; for, when the top is taken off to use as a vegetable, what remains[3] starts growing again. Moreover different parts of it flower at different times, and the flowering goes on till autumn, since the stem appears to be hard.[4] Also it bears a pod, which contains the seed, at the top of the stem.

Cat's ear[5] is smoother and has a more cultivated appearance, and is also sweeter and not like[6] *khondrylla*[7]; for the latter is altogether uneatable and[8] unfit for food, and its root contains a quantity of pungent juice.

Dandelion[9] is also unfit for food and bitter: it flowers early and quickly waxes old and the flower turns to pappus; but then another flower forms, and yet another, and this goes on right through the winter and spring up to the summer; and the flower is yellow.

[10] The like may be said of *pikris*: for this plant too blooms in spring, and like dandelion it flowers throughout the winter, and it flowers also to some extent in summer; in taste it is bitter, whence its name. These are the special points of difference

[7] χόνδρυλλα conj. St.; χανδρυ αλλα U; χανδρὺ αλλα M; χανδρὰς ἀλλὰ Ald. H.; *cadryalia* G (Tarv.); *candralia* G (Bas. Par.).

[8] τὸ γὰρ ὅλον οὐκ ἐδώδιμος αὕτη καὶ conj. W.; τὸ ὅλον οὐκ ἐδ. αὕτη γὰρ Ald.; αὕτη γὰρ ἄβρωτος conj. Sch. from Plin. 21. 105.

[9] ἀπάπη conj. W.; ἀφάκη Ald. *cf.* 7. 7. 1 n.

[10] Plin. 22. 66.

ταις ταῖς διαφοραῖς. πειρατέον δέ, ὡς ἐλέχθη, καὶ τῶν ἄλλων λαμβάνειν ὁμοίως.

XII. Πολὺ δέ τι γένος ἐστὶ καὶ τῶν σαρκορρίζων ἢ κεφαλορρίζων, ἃ καὶ πρὸς τὰ ἄλλα καὶ καθ' αὑτὰ τὰς διαφορὰς ἔχει ῥίζαις τε καὶ φύλλοις καὶ καυλοῖς καὶ ταῖς ἄλλαις μορφαῖς. τῶν γὰρ ῥιζῶν, ὥσπερ εἴρηται πρότερον, αἱ μὲν λεπυριώδεις αἱ δὲ σαρκώδεις, καὶ αἱ μὲν ἔχουσαι φλοιὸν αἱ δ' ἄφλοιοι, ἔτι δὲ αἱ μὲν στρογγύλαι αἱ δὲ προμήκεις καὶ αἱ μὲν ἐδώδιμοι αἱ δ' ἄβρωτοι. ἐδώδιμοι μὲν γὰρ οὐ μόνον βολβοὶ καὶ τὰ ὅμοια τούτοις, ἀλλὰ καὶ ἡ τοῦ ἀσφοδέλου ῥίζα καὶ ἡ τῆς σκίλλης, πλὴν οὐ πάσης ἀλλὰ τῆς Ἐπιμενιδείου καλουμένης, ἢ ἀπὸ τῆς χρήσεως ἔχει τὴν προσηγορίαν· αὕτη δὲ στενοφυλλοτέρα τε καὶ λειοτέρα τῶν λοιπῶν ἐστιν.

2 Ἐδώδιμος δὲ καὶ ἡ τοῦ ἄρου καὶ αὐτὴ καὶ τὰ φύλλα προαφεψηθέντα ἐν ὄξει καί ἐστιν ἡδεῖά τε καὶ πρὸς τὰ ῥήγματα ἀγαθή. πρὸς δὲ τὴν αὔξησιν αὐτῆς, ὅταν ἀποφυλλίσωσιν, ἔχει δὲ μέγα σφόδρα τὸ φύλλον, ἀνορύξαντες στρέφουσιν, ὅπως ἂν μὴ διαβλαστάνῃ ἀλλὰ πᾶσαν ἕλκῃ τὴν τροφὴν εἰς ἑαυτήν, ὃ καὶ ἐπὶ τῶν βολβῶν τινες

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[1] *cf.* 7. 11. 2 *ad fin.* [2] Plin. 19. 93 and 94.
[3] *μορφαῖς*: *cf.* 8. 4. 2. [4] 7. 9. 4.
[5] The legends about Epimenides suggest that the 'use' was possibly in magic: *cf.* what is said of *σκίλλα* 7. 13. 4. *cf.* Plin. *l.c.*

about these plants; now we must endeavour, as was said,[1] to set forth the special points of the other classes in like manner.

Of herbs which have fleshy or bulbous roots.

XII. [2]There is a large class of these which have fleshy or bulbous roots: these exhibit differences both as compared with other plants and with one another both in roots leaves stems and their other prominent features.[3] Of the roots, as has been said[4] already, some are in layers, some fleshy, some have a 'bark,' some not; and again some are round, some oblong, some edible and some not fit for food. Among edible roots are not only purse-tassels and others which resemble them, but also the roots of asphodel and squill, though not of all kinds of the latter, but only of the kind called 'Epimenides' squill (French sparrow-grass) which gets its name from its use[5]; this kind has narrower leaves and is smoother than the others.

[6]The root of cuckoo-pint is also edible, and so are the leaves, if they are first boiled down in vinegar; they are sweet, and are good for fractures. To increase the root, having first stripped[7] off the leaves (and the leaf is very large), they dig[8] it up and invert[9] it in order that it may not shoot,[10] but may draw all the nourishment into itself. This some

[6] Plin. 19. 96; 24. 162.

[7] *ἀποφυλλίσωσιν* conj. Sch.; *ἀποφυλάσσωσιν* U; *ἀποφυλλάσσωσιν* MAld.

[8] *ἀνορύξαντες* conj. St.; *ὃ ἀνορύξαντες* Ald.

[9] *cf.* 1. 6. 10; Plin. 19. 94 and 97, who seems to have read *κατορύξαντες*: so also G. ? 'they plunge it in a pit.'

[10] *διαβλαστάνῃ*: *cf. C.P.* 4. 8. 1.

ποιοῦσι συντιθέντες· ἡ δὲ τοῦ δρακοντίου, καλοῦσι γάρ τι δρακόντιον ἄρον διὰ τὸ τὸν καυλὸν ἔχειν τινὰ ποικιλίαν, ἄβρωτος καὶ φαρμακώδης.

3 Ἀλλὰ ἡ τοῦ φασγάνου καλουμένου γλυκεῖά τε ἑψηθεῖσα, καὶ τριφθεῖσα μιγνυμένη τῷ ἀλεύρῳ ποιεῖ τὸν ἄρτον γλυκὺν καὶ ἀσινῆ· στρογγύλη δέ ἐστι καὶ ἄφλοιος καὶ ἀποφύσεις ἔχουσα μικράς, ὥσπερ τὸ γήθυον· πολλὰς δὲ εὑρίσκουσιν ἐν ταῖς σκαλοπιαῖς· χαίρει γὰρ καὶ συλλέγει τὸ ζῶον.

Ἡ δὲ τοῦ θησείου τῇ μὲν γεύσει πικρά, τριβομένη δὲ κοιλίαν ὑποκαθαίρει. φαρμακώδεις δέ τινές εἰσι καὶ ἕτεραι, πολλῶν δὲ οὔτε φαρμακώδεις οὔτε ἐδώδιμοι. καὶ αὗται μὲν ἐν ταῖς ῥίζαις αἱ διαφοραί.

XIII. Κατὰ δὲ τὰ φύλλα τοῖς τε μεγέθεσιν καὶ τοῖς σχήμασιν. ὁ μὲν ἀσφόδελος μακρὸν καὶ στενότερον καὶ ὑπόγλισχρον ἔχει τὸ φύλλον, ἡ δὲ σκίλλα πλατὺ καὶ εὐδιαίρετον, τὸ δὲ φάσγανον ὑπό τινων δὲ καλούμενον ξίφος ξιφοειδές, ὅθεν ἔσχε καὶ τοὔνομα, ἡ δὲ ἶρις καλαμωδέστερον· τὸ δὲ τοῦ ἄρου πρὸς τῇ πλατύτητι καὶ ἔγκοιλον καὶ σικυῶδές ἐστιν· ὁ δὲ νάρκισσος στενὸν καὶ πολὺ καὶ λιπαρόν· βολβὸς δὲ καὶ τὰ βολβώδη παντελῶς στενὰ καὶ τοῦ κρόκου δ' ἔτι στενότερον.

2 Καυλὸν δὲ τὰ μὲν οὐκ ἔχει τὸ ὅλον οὐδ' ἄνθος, ὥσπερ τὸ ἄρον τὸ ἐδώδιμον· τὰ δὲ τὸν τοῦ ἄνθους μόνον, ὥσπερ ὁ νάρκισσος καὶ ὁ κρόκος· ἔνια δὲ ἔχει, καθάπερ ἡ σκίλλα καὶ ὁ βολβὸς καὶ ἡ ἶρις καὶ τὸ ξίφιον· μέγιστον δὲ πάντων ἀσφό-

[1] συντιθέντες: sense doubtful. Sch. and W. mark the word as corrupt.

[2] *cf.* 9. 20. 3; Plin. 24. 142; Diosc. 2. 166.

do also with purse-tassels, when they lay them by.[1] [2] However the root of edder-wort (for a kind of cuckoo-pint is so called because of its variegated stem) is not good for food, but is used for drugs.

But the root of the plant called corn-flag is sweet, and, if cooked and pounded up and mixed with the flour, makes the bread sweet and wholesome. It is round and without 'bark,' and has small offsets like the long onion. Many of them are found in moles' runs[3]; for this animal likes them and collects them.

[4] The root of *theseion* is bitter to the taste, but when pounded purges the bowels. There are also certain others of these roots which have medicinal properties, but of many the roots are neither medicinal nor edible. Such are the differences in the roots.

XIII. [5] In the leaves the differences are in size and shape. Asphodel has a long leaf, which is somewhat narrow and tough, while that of squill is broad and tears easily; corn-flag, which is called by some *xiphos* ('sword'), has a sword-like leaf, whence its name, and iris one more like a reed. That of cuckoo-pint, in addition to being broad, is concave and like that of cucumber; that of the narcissus is narrow substantial and glossy, those of purse-tassels and plants of that character are quite narrow, and that of crocus narrower still.

[6] Some have not a stem at all, nor a flower, as the edible cuckoo-pint; some have only the flower-stem, as narcissus and crocus; some however have a stem, as squill purse-tassels iris and corn-flag; but asphodel

[3] *παρὰ ταῖς σκαλοπιαῖς* conj. Sch.; *ἐν ταῖς σκ.* conj. W.; *ταῖς σκολοπίαις* UMAld. [4] Plin. 22. 66. [5] Plin. 21. 108.
[6] Plin. 21. 108 and 109.

δελος· ὁ γὰρ ἀνθέρικος μέγιστος· ὁ δὲ τῆς ἴριδος ἐλάττων μὲν σκληρότερος δὲ τὸ δὲ ὅλον ἀνθερικώδης. ἔστι δὲ καὶ πολύκαρπος ὁ ἀσφόδελος, καὶ ὁ καρπὸς αὐτοῦ ξυλώδης τῇ μὲν μορφῇ τρίγωνος τῷ δὲ χρώματι μέλας· γίνεται δὲ ἐν τῷ στρογγύλῳ τῷ ὑποκάτω τοῦ ἄνθους, ἐκπίπτει δὲ τοῦ
3 θέρους, ὅταν τοῦτο διαχάνῃ. τὴν ἄνθησιν ποιεῖται κατὰ μέρος, ὥσπερ καὶ ἐπὶ τῆς σκίλλης, ἄρχεται δὲ πρῶτον ἀπὸ τῶν κάτωθεν. ἐν δὲ τῷ ἀνθερίκῳ συνίσταται σκώληξ, ὃς εἰς ἄλλο μεταβάλλει ζῷον ἀνθρηνοειδές, εἶθ' ὅταν ὁ ἀνθέρικος αὐανθῇ διεσθίον ἐκπέταται. δοκεῖ δὲ ἴδιον ἔχειν πρὸς τὰ ἄλλα τὰ λειόκαυλα, διότι στενὸς ὢν ἀποφύσεις ἄνωθεν ἔχει. πολλὰ δὲ εἰς τροφὴν παρέχεται χρήσιμα· καὶ γὰρ ὁ ἀνθέρικος ἐδώδιμος σταθευόμενος καὶ τὸ σπέρμα φρυγόμενον καὶ πάντων δὲ μάλιστα ἡ ῥίζα κοπτομένη μετὰ σύκου καὶ πλείστην ὄνησιν ἔχει καθ' Ἡσίοδον.
4 Ἅπαντα μὲν οὖν φιλόζωα τὰ κεφαλόρριζα μάλιστα δ' ἡ σκίλλα· καὶ γὰρ κρεμαννυμένη ζῇ καὶ πλεῖστόν γε χρόνον διαμένει· δύναται δὲ καὶ τὰ θησαυριζόμενα σώζειν, ὥσπερ τὴν ῥοὰν ἐμπηγνυμένου τοῦ μίσχου, καὶ τῶν φυτευομένων δ' ἔνια βλαστάνει θᾶττον ἐν αὐτῇ· λέγεται δὲ καὶ πρὸ τῶν θυρῶν τῆς εἰσόδου φυτευθεῖσαν ἀλεξητήριον εἶναι τῆς ἐπιφερομένης δηλήσεως. πάντα δὲ ταῦτα ἀθρόα φύεται, καθάπερ καὶ τὰ κρόμυα καὶ τὰ σκόροδα· παραβλαστάνουσι γὰρ ἀπὸ τῆς

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[1] ἐκπίπτει conj. W.; ἐκπίπτων Ald.

[2] ἄνθησιν conj. Scal.; ἄνανσιν corr. to αὔανσιν U; ἄνανσιν M; αὔανσιν Ald.; *floret ver partes* G.

has the tallest of all—for the *antherikos* (asphodel-stalk) is very tall: that of iris is smaller, but tougher, though in general it is like the asphodel-stalk. Asphodel also produces much fruit, and its fruit is woody: in shape it is triangular and in colour black; it is found in the round vessel which is below the flower, and it falls out[1] in summer when this splits open. It does not produce all its flowers[2] at once; in which respect it resembles squill, but the flowering begins at the bottom. In the stalk of asphodel forms a grub which changes into another creature like a hornet, and then, when the stem withers, eats its way out and flies away. A peculiarity of the plant as compared with others which have a smooth stem appears to be that, though it is slender, it has outgrowths at the top. It provides many things useful for food: the stalk is edible when fried, the seed when roasted, and above all the root[3] when cut up with figs; in fact, as Hesiod says,[4] the plant is extremely profitable.

Now all bulbous plants are tenacious of life, but especially squill; for this even lives when hung up and continues to do so for a very long time; it is even able to keep other things that are stored, for instance the pomegranate, if the stalk of the fruit is set in it; and some cuttings[5] strike more quickly if set in it; and it is said that, if planted before the entrance door of a house, it wards off mischief[6] which threatens it. All these bulbs grow in masses, as do onions and garlic; for they make offsets from the root, and some

[3] *cf.* 7. 9. 4; 9. 9. 6.
[4] Hes. *Op.* 41.
[5] *cf* 2. 5. 5; *C.P.* 5. 6. 10.
[6] Sc. witchcraft. *veneficiorum noxam* Plin. 21. 108.

ῥίζης· ἔνια δὲ καὶ ἀπὸ τοῦ σπέρματος φανερῶς, οἷον ὅ τε ἀνθέρικος καὶ τὸ λείριον καὶ τὸ φάσγανον καὶ ὁ βολβός.

5 Ἀλλ' ἴδιον τοῦτο τοῦ βολβοῦ λέγεται, τὸ μὴ ἀπὸ πάντων βλαστάνειν ἅμα τῶν σπερμάτων, ἀλλὰ τοῦ μὲν αὐτοετὲς τοῦ δ' εἰς νέωτα, καθάπερ τὸν αἰγίλωπά φασι καὶ τὸν λωτόν. τοῦτο μὲν οὖν εἴπερ ἀληθὲς κοινὸν ἑτέρων. κοινὸν δὲ ἴσως καὶ τὸ μέλλον λέγεσθαι, πλὴν οὐ πολλῶν, θαυμαστὸν δὲ ἐπὶ πάντων, ὅπερ ἐπί τε τῆς σκίλλης καὶ τοῦ ναρκίσσου συμβαίνει· τῶν μὲν γὰρ ἄλλων καὶ τῶν ἐξ ἀρχῆς φυτευομένων καὶ τῶν βλαστανόντων καθ' ὥραν ἔτους τὸ φύλλον ἀνατέλλει πρῶτον, εἶθ' ὕστερον ὁ καυλός· ἐπὶ δὲ τούτων ὁ καυλὸς πρότερον.

6 Τοῦ ναρκίσσου δὲ ὁ τοῦ ἄνθους μόνον εὐθὺ προωθῶν τὸ ἄνθος· τῆς δὲ σκίλλης καθ' αὑτόν, εἰς ὕστερον ἐπὶ τούτῳ τὸ ἄνθος ἀνίσχον προσκαθήμενον· ποιεῖται δὲ τὰς ἀνθήσεις τρεῖς, ὧν ἡ μὲν πρώτη δοκεῖ σημαίνειν τὸν πρῶτον ἄροτον, ἡ δὲ δευτέρα τὸν μέσον, ἡ δὲ τρίτη τὸν ἔσχατον· ὡς γὰρ ἂν αὗται γένωνται καὶ οἱ ἄροτοι σχεδὸν οὕτως ἐκβαίνουσιν· ὅταν δὲ οὗτος ἀπογηράσῃ, τότε ἡ τῶν φύλλων βλάστησις πολλαῖς ἡμέραις ὕστερον· ὡσαύτως δὲ καὶ ἐπὶ τοῦ ναρκίσσου, πλὴν οὔτε καυλὸν ἕτερον ἔχει παρὰ τὸν τοῦ ἄνθους, ὥσπερ εἴπομεν, οὔτε καρπὸν φανερόν, ἀλλ'

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[1] αἰγίλωπα conj. Sch. from Plin. 21. 103; γίλωπα UMAld.

[2] εὐθὺ προωθῶν conj. W.; εὐθυπρόωρον Ald.H. *cf.* Plin. 21. 66, where however the statement is transferred to the crocus.

plainly are also increased by seed, as the asphodel polyanthus narcissus corn-flag and purse-tassels.

However it is said to be a peculiarity of purse-tassels that all the seeds do not germinate at once, but some in the same year, some the next year; a like account is given of *aigilops*[1] and trefoil. If then this is true, it is not peculiar to this plant. Nor perhaps is the following characteristic, which is not found in many plants and is marvellous wherever it does occur—and it is found in squill and narcissus: namely that, whereas in most plants, whether those originally planted or those which are produced from them in season, the leaf comes up first and then presently the stem, in these plants the stem comes up first.

In the case of narcissus it is only the flower-stem which comes up, and it immediately pushes up[2] the flower. But in squill it is the stem[3] proper which thus appears, and presently the flower appears emerging[4] from and sitting on it. And it makes three flowerings,[5] of which the first appears to mark the first seed-time, the second the middle one, and the third the last one; for, according as these flowerings have occurred,[6] so the crops usually turn out. But, when the flower-stem[7] has waxed old, then the growth of the leaves follows many days later. So also is it with narcissus, except that it has no second stem besides the flower-stem, as we said, nor any visible fruit; but the flower itself

[3] *i.e.* the whole 'bud.'

[4] *ἀνίσχον* Ald.; *ἀνίσχων* conj. Sch. followed by W.

[5] Plin. *l.c.*; *cf.* 18. 237.

[6] *i.e.* the flowering is the sign when to sow. The same is said of the fruiting of *σχῖνος de signis* 55.

[7] *οὗτος* conj. Sch.; *οὕτως* Ald.

αὐτὸ τὸ ἄνθος ἅμα τῷ καυλῷ καταφθίνει καὶ ὅταν αὐανθῇ τότε τὰ φύλλα ἀνατέλλει.

7 Πρὸς μὲν οὖν τὰ ἄλλα τὰ συνάμφω ταῦτα ἴδια· πρὸς δὲ τὰ προανθοῦντα τῶν φύλλων καὶ τῶν καυλῶν, ὅπερ δοκεῖ ποιεῖν τὸ τίφυον καὶ ἕτερα τῶν ἀνθικῶν, ἔτι τε τῶν δένδρων ἡ ἀμυγδαλὴ μάλιστα ἢ μόνον, ὅτι ταῦτα μὲν ἅμα τῷ ἄνθει προφαίνει τὸ φύλλον ἢ εὐθὺς κατόπιν, ὥστε καὶ διαζητεῖσθαι περί τινων, ἐπὶ δὲ τούτων οἷον ἀφ' ἑτέρας ἀρχῆς φαίνεται καὶ διὰ τὸ πλῆθος τῶν ἡμερῶν καὶ διὰ τὸ μὴ πρότερον βλαστάνειν πρὶν τοῦ μὲν τὸ ἄνθος τοῦ δὲ καὶ ὁ καυλὸς ὅλος ἀπογηράσῃ. ἡ δὲ βλάστησις προτέρα μὲν τῆς σκίλλης, ὑστέρα δὲ τοῦ ναρκίσσου· πολὺ δὲ πλέον τὸ φύλλον οὗτος ἀφίησι, καί ἐστιν ἡ ῥίζα αὐτὴ μικρὰ καὶ οὐ μεγάλη, προσεμφερὴς δὲ κατὰ τὸ σχῆμα τῷ βολβῷ, πλὴν <οὐ> λεπυριώδης. ταῦτα μὲν οὖν ἔχει σκέψιν.

8 Τῶν δὲ βολβῶν ὅτι πλείω γένη φανερόν, καὶ γὰρ τῷ μεγέθει καὶ τῇ χρόᾳ καὶ τοῖς σχήμασι διαφέρουσι καὶ τοῖς χυλοῖς· ἐνιαχοῦ γὰρ οὕτω γλυκεῖς ὥστε καὶ ὠμοὺς ἐσθίεσθαι, καθάπερ ἐν Χερρονήσῳ τῇ Ταυρικῇ. μεγίστη δὲ καὶ ἰδιωτάτη διαφορὰ τῶν ἐριοφόρων· ἔστι γάρ τι γένος τοιοῦτον, ὃ φύεται μὲν ἐν αἰγιαλοῖς ἔχει δὲ τὸ ἔριον ὑπὸ τοὺς πρώτους χιτῶνας, ὥστε ἀνὰ μέσον εἶναι

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[1] τίφυον Ald., *cf. C.P.* 1. 10. 5; τ' ἴφυον conj. W.; *iphyum* GBas.Par. *cf.* 6. 6. 11.
[2] ἡ add. Sch.
[3] ἐπὶ conj. H.; περὶ UMAld.
[4] W. adds ἂν.
[5] αὐτὴ : sc. apart from offsets.
[6] μικρὰ conj. Sch.; οὐ μικρὰ Ald.

perishes with the stem, and when it has withered, then the plant puts up its leaves.

These two plants then, as compared with the other bulbous plants are peculiar; and, as compared with those which bloom before the leaves and stems appear (as the autumn squill [1] seems to do, and other plants with conspicuous flowers, as well as, among trees, the almond especially, if not alone), there is the distinction that, while these two put forth their leaves along with the flowers or [2] immediately afterwards (so that about some the matter is uncertain) in [3] the case of these two the flower appears, as it were, from a different starting-point, there being a considerable number of days in between, and the growth of the leaves not beginning till,[4] in the case of one of them, the flower, and in the case of the other, the whole stem has withered. Squill produces its leaves before the flower, narcissus afterwards; but the latter produces much more abundant foliage, and the individual [5] root is small [6] rather than large, resembling purse-tassels in shape, except that it is not formed of scales.[7] About these matters then there is doubt.

Of purse-tassels it is plain that there are several kinds; for they differ in size colour shape and taste. [8] In some places they are so sweet as to be eaten raw, as in the Tauric Chersonese. But the greatest and most distinct difference is shown by the 'wool-bearing [9]' purse-tassels; for there is such a kind, and it grows on [10] the sea-shore, and has the wool beneath the outer tunic, so that it is between

[7] *οὐ λεπυριώδης* conj. Sch. from G, *non squamata*; *οὐδὲ πυρώδη* UMAld.; *οὐ λεπυρώδης* H.

[8] Plin. 19. 95; Athen. 2. 64.

[9] Plin. 19. 32. See Index.

[10] *ἐν* after *μὲν* add. W.

τοῦ τε ἐδωδίμου τοῦ ἐντὸς καὶ τοῦ ἔξω· ὑφαίνεται δὲ ἐξ αὐτοῦ καὶ πόδεια καὶ ἄλλα ἱμάτια· δι' ὃ καὶ ἐριῶδες τοῦτο καὶ οὐχ ὥσπερ τὸ ἐν Ἰνδοῖς τριχῶδες.

9 Πλείω δὲ καὶ τὰ βολβώδη καὶ ἐλάττω. ταῦτα δὲ . . . καθάπερ τὸ λευκόϊον καὶ βολβίνη καὶ ὀπιτίων καὶ κύϊξ καὶ τρόπον τινὰ τὸ σισυρίγχιον. βολβώδη δὲ ταῦτα ὅτι στρογγύλα ταῖς ῥίζαις· ἐπεὶ τοῖς γε χρώμασι λευκὰ καὶ οὐ λεπυριώδη. ἴδιον δὲ τοῦ σισυριγχίου τὸ τῆς ῥίζης αὐξάνεσθαι τὸ κάτω πρῶτον, ὃ καλοῦσι . . . χειμῶνα, τοῦ δ' ἦρος ὑποφαίνοντος τοῦτο μὲν ταπεινοῦσθαι τὸ δ' ἄνω τὸ ἐδώδιμον αὐξάνεσθαι. καὶ τὰ μὲν τοιαύτας ἔχει τὰς διαφοράς.

XIV. Ἴδια δὲ καὶ ταῦτα ἐν τοῖς ποιώδεσιν, οἷον τό [τε] ἐπὶ τοῦ ἀδιάντου συμβαῖνον· οὐδὲ γὰρ ὑγραίνεται τὸ φύλλον βρεχόμενον οὐδ' ἐπίδροσόν ἐστι διὰ τὸ μὴ τὴν νοτίαν ἐπιμένειν, ὅθεν καὶ ἡ προσηγορία. γένη δὲ αὐτοῦ δύο, τὸ μὲν λευκὸν τὸ δὲ μέλαν, χρήσιμα δ' ἀμφότερα πρὸς ἔκρυσιν κεφαλῆς τριχῶν ἐν ἐλαίῳ τριβόμενα. φύεται δὲ

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[1] δι' ὃ καὶ ἐρ. τοῦτο: text probably defective. ? δι' ὃ καὶ <χρησιμὸν τὸ> ἐριῶδες τοῦτο: 'wherefore this woolly kind is serviceable, which the Indian hairy kind is not.'

[2] Plin. 19. 95.

[3] καὶ ἐλάττω· ταῦτα δὲ: text corrupt and defective.

[4] ὀπιτίων H.; ὁ πιτίων Ald.; *pithyon* Plin. *l.c.*; ὀπιτίων and κύϊξ were possibly earth-nuts.

[5] γε conj. Sch.; τε Ald.

the edible inside and the outside: of it are woven felt shoes and other articles of apparel. Wherefore[1] this kind is woolly and distinct from the Indian kind, which is hairy.

[2]There are also several kinds of plants of the same class as purse-tassels . . . .[3] such as snowdrop star-flower *opition*[4] *kyix*, and to a certain extent Barbary nut. These belong to this class only in having round roots; for in colour[5] they are white, and the bulbs are not formed of scales. A peculiarity of Barbary nut is that the lower end of the root grows first, and this is called . . . .; it grows[6] during winter, but, when spring appears, it decreases, while the upper part, which is edible, grows. Such are the differences in these plants.

Of certain properties and habits peculiar to certain herbaceous plants.

XIV. There are also the following peculiarities in herbaceous plants, for instance that[7] which we find in 'wet-proof' (maidenhair); [8]the leaf does not even get wet when it is watered, nor does it catch the dew,[9] because the dew does not[10] rest on it; whence its name. [11]There are two kinds, the white 'wet-proof' (English maidenhair), and the black (maidenhair); and both are useful to prevent the falling off of the hair of the head, for which purpose they are pounded up and mixed with olive-oil. They grow

[6] 'Grows' supplied from G and Plin. *l.c.*, who have no trace of ὃ καλοῦσι.

[7] I have bracketed τε. [8] Plin. 22. 62–65.

[9] ἐπίδροσον conj. W.; ἐπίδηλον $UP_2MAld.$; *nec quicquam adhaesisse humoris constat* G.

[10] μὴ before τὴν add. W.

[11] Plin. *l.c.*; 27. 138; 25. 132.

μαλιστα πρὸς τὰ ὑδρηλά. ὡς δὲ οἴονταί τινες, καὶ πρὸς στραγγουρίαν τὸ τριχομανὲς ποιεῖ· ἔχει δὲ τὸν καυλὸν ὅμοιον τῷ ἀδιάντῳ τῷ μέλανι, φύλλα δὲ μικρὰ σφόδρα καὶ πυκνὰ καὶ πεφυκότα καταντικρὺ ἀλλήλων, ῥίζα δὲ οὐχ ὕπεστι· χωρία δὲ φιλεῖ σκιερά.

2 Τῶν δὲ κατὰ μέρος ἀνθούντων ἴδιον τὸ περὶ τὸ ἄνθεμον, ὅτι τῶν μὲν ἄλλων πάντων τὰ κάτω πρῶτον ἀπανθεῖ τούτου δὲ τὰ ἄνω· τυγχάνει δ' αὐτοῦ τὸ μὲν κύκλῳ τὸ λευκὸν ἄνθος τὸ δὲ ἐν τῷ μέσῳ τὸ χλωρόν· καὶ καρπὸς ὃς ἐκπίπτει, καθάπερ τοῖς ἀκανθώδεσι, καταλιπὼν τὴν πρόσφυσιν κενήν· εἶδη δ' αὐτοῦ πλείω.

3 Ἴδιον δὲ καὶ τὸ περὶ τὴν ἀπαρίνην, ἣ καὶ τῶν ἱματίων ἀντέχεται διὰ τὴν τραχύτητα καί ἐστι δυσαφαίρετον· ἐν τούτῳ γὰρ ἐγγίνεται τῷ τραχεῖ τὸ ἄνθος οὐ προϊὸν οὐδὲ ἐκφαῖνον ἀλλ' ἐν ἑαυτῷ πεττόμενον καὶ σπερμογονοῦν· ὥστε παρόμοιον εἶναι τὸ συμβαῖνον ὥσπερ ἐπὶ τῶν γαλεῶν καὶ ῥινῶν· ἐκεῖνά τε γὰρ ἐν ἑαυτοῖς ὠοτοκήσαντα ζωογονεῖ, καὶ αὕτη τὸ ἄνθος ἐν ἑαυτῇ κατέχουσα καὶ πέττουσα καρποτοκεῖ.

XV. Ὅσα δὲ τὰς ἀνθήσεις λαμβάνουσι ἀκολουθοῦντα τοῖς ἄστροις, οἷον τὸ ἡλιοτρόπιον καλούμενον καὶ ὁ σκόλυμος, ἅμα γὰρ ταῖς τροπαῖς καὶ οὗτος, ἔτι δὲ τὸ χελιδόνιον, καὶ γὰρ τοῦτο ἅμα τῷ χελιδονίᾳ ἀνθεῖ, ταῦτα δὲ δόξειεν ἂν τῇ μὲν φυσικὴν ἔχειν τὴν αἰτίαν τῇ δὲ συμπτωματικήν.

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[1] *i.e.* the white kind. Sch. followed by G adds τὸ καὶ τριχομανὲς καλούμενον after τὸ μὲν λευκὸν above.

especially in damp places. Some think that *trikhomanes*[1] (English maidenhair) is also useful in cases of strangury. Its stem is like that of the black kind, but it has small leaves, which are close set and grow in opposite pairs; there is no root below, and the plant loves shady places.

Of those plants which do not flower all at once *anthemon* has the peculiarity that, while in all others[2] the lower part flowers first, in this plant it is the upper part which does so; the outer circle of the flower is white,[3] and the centre green[4]; and the fruit falls off, as in spinous plants, leaving the attachment bare. There are several forms of it.

[5] Bedstraw has the peculiarity that it sticks to clothes owing to its roughness, and it is hard to pull away; indeed it is in this rough part that the flower is contained: it does not project nor show, but matures within itself and produces seed; so that its habit is like that of weasels and sharks; for, as these animals[6] likewise produce eggs in themselves and then bear their young alive, so this plant keeps its flower within itself, matures it and produces fruit.

XV. [7] As to these plants whose flowering time is dependent on the heavenly bodies,[8] as the plant called *heliotropion*, golden thistle (for this also blooms at the solstice), and also 'swallow-plant' (greater celandine)—for this blooms when the[9] Swallow-wind blows—the reason in these cases would seem to be partly in their nature and partly accidental.

[2] ἴδιον after πάντων om. W. after Sch.
[3] τὸ λευκὸν: ? λευκὸν τὸ. [4] ? om. τὸ before χλωρόν.
[5] Plin. 21. 104. [6] *cf.* Arist. *H.A.* 6. 11.
[7] Athen. 15. 32. [8] ἄστροις conj. St.; ἀγρίοις Ald.
[9] τῷ conj. Sch.; τῇ MAld. *cf.* Plin. 2. 122.

2 Πολλὰ δὲ τοιαῦτά ἐστι καὶ ἐν ἑτέροις ἴδια· οἷον καὶ ἡ τοῦ ἀειζώου φύσις τὸ διαμένειν ὑγρὸν ἀεὶ καὶ χλωρόν, φύλλον σαρκῶδες ἔχον καὶ λεῖον καὶ πρόμηκες. φύεται δὲ ἔν τε τοῖς ἀλιπέδοις τοῖς τε ἐπὶ τῶν τειχῶν ἀνδήροις καὶ οὐχ ἥκιστα ἐπὶ τῶν κεράμων, ὅταν ἐπιγένηται γῆς τις ἀμμώδης συρροή.

3 Πολλὰ δ' ἄν τις ἴσως λάβοι καὶ ἕτερα περιττά. χρὴ δέ, ὥσπερ πολλάκις εἴρηται, τὰς ἰδιότητας θεωρεῖν καὶ τὰς διαφορὰς πρὸς τὰ ἄλλα. τὰ μὲν ἐν πλείοσιν ἰδέαις ἐστὶ καὶ σχεδὸν οἷον ὁμωνύμοις, ὥσπερ ὁ λωτός· τούτου γὰρ εἴδη πολλὰ διαφέροντα καὶ φύλλοις καὶ καυλοῖς καὶ ἄνθεσι καὶ καρποῖς, ἐν οἷς καὶ ὁ μελίλωτος καλούμενος· καὶ δυνάμει δὲ τῇ κατὰ τὴν προσφοράν, ἔτι τε τῷ μὴ τοὺς αὐτοὺς τόπους ζητεῖν. ὁμοίως δὲ καὶ ἕτερα πλείω.

4 Τὰ δὲ ἐν ἐλάττοσιν, ὥσπερ ὁ στρύχνος ὁμωνυμία τινὶ παντελῶς εἰλημμένος· ὁ μὲν γὰρ ἐδώδιμος καὶ ὥσπερ ἥμερον, καρπὸν ἔχων ῥαγώδη, ἕτεροι δὲ δύο εἰσίν, ὧν ὁ μὲν ὕπνον ὁ δὲ μανίαν ἐμποιεῖν δύναται, πλείων δ' ἔτι δοθεὶς καὶ κτείνει. ὁμοίως δὲ τοῦτο καὶ ἐφ' ἑτέρων ἐστὶ λαβεῖν, ἃ πολλὴν ἔχει διάστασιν. περὶ μὲν οὖν τῶν ἄλλων τῶν ποιωδῶν ἱκανῶς εἴρηται. περὶ δὲ τοῦ σίτου καὶ τῶν σιτωδῶν μετὰ ταῦτα λεκτέον· τοῦτο γὰρ ἔτι κατάλοιπον ἦν.

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[1] *οἷον* conj. W.; *διὸ* Ald.

[2] *ἀλιπέδοις* conj. Sch.; *ἀληπέδοις* U; *ἀληπέδοις* M; *ἀλοπέδοις* Ald. *cf.* Xen. *Hell.* 2. 4. 30.

[3] *τε* after *τοῖς* add. W. after Lobeck.

[4] *e.g. λωτός* and *μελίλωτος*. See Index, *λωτός*.

[5] *μελίλωτος* conj. Bod.; *μελίας σῖτος* Ald.

Such peculiarities are common in other plants also; thus[1] it is the nature of the house-leek to remain always moist and green, its leaf being fleshy smooth and oblong. It grows on flat shores,[2] on the[3] earthy tops of walls, and especially on tiled roofs, when there is on them a sandy accumulation of earth.

Possibly one might mention many other eccentricities. But, as has been repeatedly said, we must only observe the peculiarities and differences which one plant has as compared with others. Some plants are found in several forms which have almost[4] the same name, for instance the *lotos*; for of this there are many forms differing in leaves stems flowers and fruit, including the plant called *melilotos*[5]; there are also forms differing in the virtues for which[6] they are used as food, and again in their fondness for different localities. So too is it with many other plants.

Others are found in fewer forms, as *strykhnos*,[7] which is a general name covering plants that are quite distinct; one is edible and like a cultivated plant, having a berry-like fruit, and there are two others,[8] of which the one is said to induce sleep, the other to cause madness, or, if it is administered in a larger dose, death. The same thing may be observed in other plants which are widely different. Now about the other herbaceous plants enough has been said; but concerning corn and corn-like plants we must speak next; for this subject still lies before us.

[6] δὲ τῇ conj. Sch.; διτταὶ UM; διτταῖς Ald.

[7] *cf.* 7. 7. 2; Plin. 21. 177–179; Diosc. 4. 70–73; Index.

[8] In 9. 11. 5 these two plants are said to be *συνώνυμοι, i.e.* different forms of the same plant, whereas the 'edible' *στρύχνος* is the same only in name (*ὁμωνυμίᾳ*). *cf.* 9. 12. 5.

BOOK VIII

Θ

I. Περὶ μὲν οὖν τῶν ἄλλων ποιωδῶν ἱκανῶς εἰρήσθω· περὶ δὲ σίτου καὶ τῶν σιτωδῶν λέγωμεν ὁμοίως τοῖς πρότερον· τοῦτο γὰρ κατάλοιπον ἦν τῶν ποιωδῶν.

Δύο δὲ αὐτοῦ γένη τὰ μέγιστα τυγχάνει· τὰ μὲν γὰρ σιτώδη, οἷον πυροὶ κριθαὶ τίφαι ζειαὶ τὰ ἄλλα τὰ ὁμοιόπυρα ἢ ὁμοιόκριθα· τὰ δὲ χεδροπά, οἷον κύαμος ἐρέβινθος πισὸς καὶ ὅλως τὰ ὄσπρια προσαγορευόμενα· τρίτον δὲ παρ' αὐτὰ κέγχρος ἔλυμος σήσαμον καὶ ἁπλῶς τὰ ἐν τοῖς θερινοῖς ἀρότοις ἀνώνυμα κοινῇ προσηγορίᾳ.

2 Ἔστι δὲ ἡ μὲν γένεσις αὐτῶν μία καὶ ἁπλῆ· φύεται γὰρ ἀπὸ σπέρματος, ἐὰν μή τι σπάνιον καὶ ὀλίγον ἀπὸ τῆς ῥίζης. ὧραι δὲ τοῦ σπόρου τῶν πλείστων δύο· πρώτη μὲν καὶ μάλιστα ἡ περὶ Πλειάδος δύσιν, ᾗ καὶ Ἡσίοδος ἠκολούθηκε

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[1] τῶν before ποιωδῶν om. Sch.

[2] Plin. 18. 48–80.

[3] ἔλυμος: μελίνη appears to be the Attic name for this plant. Sch. would restore it for ἔλυμος here and 4. 4. 10; 8. 11. 1.

BOOK VIII

Of Herbaceous Plants: Cereals, Pulses, and 'Summer Crops.'

Of the three classes and the times of sowing and of germination.

I. Let the above suffice for an account of the other herbaceous[1] plants; let us now discuss corn and corn-like plants in the same manner as those already treated; for this class of herbaceous plants we reserved.

[2]There are two principal classes; there are the corn-like plants such as wheat barley one-seeded wheat rice-wheat and the others which resemble either of the first two; and again there are the leguminous plants, as bean chick-pea pea, and in general those to which the name of pulses is given. Besides these there is a third class, which includes millet[3] Italian millet, sesame and in general the plants which belong to the summer seed-time,[4] which lack any common designation.

There is only one single way of propagating these; they grow from seed, except that some may grow rarely and scantily from a root. There are two seasons for sowing most of them; the first and most important is about the setting of the Pleiad[5]; this rule we find even Hesiod[6] following with

[4] *cf.* 8. 7. 3.
[5] Πλειάδος conj. Sch.; πλειάδας U; πλειάδων Ald.
[6] Hes. *Op.* 383.

καὶ σχεδὸν οἱ πλεῖστοι, δι' ὃ καὶ καλοῦσί τινες αὐτὴν ἄροτον· ἄλλη δ' ἀρχομένου τοῦ ἦρος μετὰ τὰς τροπὰς τοῦ χειμῶνος. οὐ τῶν αὐτῶν δὲ ἑκατέρα. τὰ μὲν γὰρ αὐτῶν φιλεῖ πρωϊσπορεῖσθαι, τὰ δὲ ὀψὲ διὰ τὸ μὴ δύνασθαι φέρειν τοὺς χειμῶνας, τὰ δὲ πρὸς ἀμφοτέρας τὰς ὥρας οὐ κακῶς ἔχει, καὶ πρὸς χειμῶνα καὶ πρὸς ἔαρ.

3 Πρωΐσπορα μὲν οὖν ἐστι πυρὸς κριθή, καὶ τούτων ἡ κριθὴ πρωϊσπορώτερον· ἔτι δὲ ζειὰ τίφη ὀλύρα καὶ εἴ τι ἕτερον ὁμοιόπυρον· ἁπάντων γὰρ σχεδὸν ὁ αὐτὸς χρόνος τῆς σπορᾶς· τῶν δὲ χεδροπῶν μάλιστα ὡς εἰπεῖν κύαμος καὶ ὦχρος· ταῦτα γὰρ διὰ τὴν ἀσθένειαν προλαβεῖν τῇ ῥιζώσει βούλεται τοὺς χειμῶνας· πρωΐσπορον δὲ καὶ ὁ θέρμος· ἀπὸ τῆς ἅλω γάρ φασι δεῖν καταβάλλειν εὐθύς.

4 Ὀψίσπορα δὲ τούτων γε αὐτῶν ὅσα διαφέρει τοῖς γένεσιν, οἷον πυρῶν τέ τι γένος καὶ κριθῶν ὃ καλοῦσι τρίμηνον διὰ τὸ ἐν τοσούτῳ τελειοῦσθαι· καὶ τῶν χεδροπῶν τὰ τοιάδε, φακὸς ἀφάκη πισός. ἐν ἀμφοτέραις δὲ ταῖς ὥραις τῶν χεδροπῶν, καθάπερ ὄροβος ἐρέβινθος· οἱ δὲ καὶ τὸν κύαμον ὀψὲ σπείρουσιν, ἐὰν ὑστερήσωσι τῶν πρώτων ἀρότων. ἁπλῶς δὲ πρωϊσποροῦσι τὰ μὲν δι' ἰσχὺν ὡς δυνάμενα φέρειν τοὺς χειμῶνας, τὰ δὲ δι' ἀσθένειαν, ὅπως προλάβωσι ταῖς εὐδίαις τὴν αὔξησιν. δύο μὲν οὖν αὗται. τρίτη δὲ τῶν θερινῶν ἣν

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[1] A cultural variety of ζειά. *cf.* 8. 9. 2.
[2] τῶν δέ γε Ald.; γε om. Sch.
[3] ὦχρος conj. W.; κέγχρος Ald.; om. G. *cf.* 8. 3. 1 and 2.
[4] *cf.* 8. 11. 8.

most authorities; wherefore some call it simply 'the seed-time.' Another time is at the beginning of spring after the winter equinox. However different crops are sown at the two seasons. For some of them love to be sown early, some late because they cannot bear the winters, while some will do not amiss at either season, both towards winter and towards spring.

Crops sown early are wheat and barley, and of these the latter is sown the earlier; also rice-wheat one-seeded wheat *olyra*,[1] and others which resemble wheat. For all of these the time of sowing is about the same. Of leguminous plants[2] bean and *okhros*,[3] it may be said, are specially sown at this time; for these on account of their weakness like to be well rooted before the winter. Lupin is also sown early; in fact they say it should be sown straight from the threshing-floor.[4]

Those which are sown late are certain special varieties[5] of these very kinds, as a certain kind of wheat, and of barley the kind which is called 'three months barley' because it takes that time to mature; and among leguminous plants lentil tare pea. However some of these plants are sown at both seasons, as vetch and chick-pea; some also sow beans late, if they have missed the first seed-time. To speak generally, some crops are sown early because of their robustness, since they can stand the winters, some because of their weakness, so that their growth may be secured[6] in the fine weather. These then are the two seasons; the third is that of the summer crops of which we

[5] τοῖς γένεσιν: τῇ γενέσει W. *i.e.* 'certain kinds which differ as to their germination.' [6] *cf. C.P.* 4. 7. 2.

εἴπομεν, ἐν ᾗ κέγχρος σπείρεται καὶ μέλινος καὶ σήσαμον, ἔτι δ' ἐρύσιμον καὶ ὄρμινον. χρόνοι μὲν οὖν ἑκάστων οὗτοι.

5 Βλαστάνει δὲ τὸ μὲν θᾶττον τὸ δὲ βραδύτερον· καὶ κριθὴ μὲν καὶ πυρὸς ἑβδομαῖα μάλιστα· προτερεῖ δὲ ἡ κριθὴ μᾶλλον· τὰ δ' ὄσπρια τεταρταῖα ἢ πεμπταῖα πλὴν κυάμων· κύαμος δὲ καὶ τῶν σιτωδῶν ἔνια πλείοσιν· ἐνιαχοῦ γὰρ καὶ πεντεκαιδεκαταῖος, ὁτὲ δὲ καὶ εἰκοσταῖος· δυσφυέστατον γὰρ τοῦτο πάντων, ἐὰν δὲ δὴ καὶ σπαρέντος ἐπὶ πλέον ὕδωρ ἐπιγένηται, καὶ παντελῶς. εἰ δὲ τῶν ἐν τοῖς ἠρινοῖς ἀρότοις θᾶττον ἡ ἔκφυσις διὰ τὴν ὥραν σκεπτέον.

6 Χρὴ δὲ τὰς ἀναβλαστήσεις καὶ τὰς διαφύσεις ταύτας ὡς ἐπὶ τὸ πᾶν διαλαβεῖν· ἐνίοτε γὰρ ἐνιαχοῦ καὶ ἐν ἐλάττοσιν ἡμέραις, καθάπερ ἐν Αἰγύπτῳ <κριθή>· τριταίαν γάρ φασι καὶ τεταρταίαν ἀνατέλλειν· παρ' ἄλλοις δὲ ἐν πλείοσι τῶν εἰρημένων, ὅπερ καὶ οὐκ ἄλογον, ὅταν καὶ χώρα καὶ ἀὴρ διαφέρῃ καὶ πρωϊαίτερον ἢ ὀψιαίτερον ἀρόσῃ καὶ τὰ ἐπιγινόμενα ἀνόμοια τυγχάνῃ. ἡ μὲν γὰρ μανὴ καὶ κούφη καὶ εὐκράτῳ ἀέρι ταχὺ καὶ ῥᾳδίως ἀναδίδωσιν, ἡ δὲ γλίσχρα καὶ βαρεῖα βραδέως, ἡ δὲ τοῖς τόποις αὐχμωδεστέρα βραδύτερον.

7 Ἔτι δὲ ἂν χειμῶνες ἐπιγένωνται καὶ αὐχμοὶ καὶ εὐδίαι καὶ πάλιν ὕδατα· καὶ γὰρ ἐν τούτοις πολὺ παραλλάττουσιν. ὡσαύτως δὲ καὶ ἐὰν ἡ

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[1] ἔνια conj. W.; ἐν Ald.
[2] The reason is given *C.P.* 4. 8. 2.
[3] *cf.* 7. 1. 4.

spoke, in which are sown millet Italian millet sesame, and also *erysimon* and *horminon*. Such then are the times for each.

Some are quicker in coming up, some slower. Barley and wheat generally come up on the seventh day, but barley is the earlier. Pulses take four or five days, except beans; for they, like some kinds[1] of corn, require a longer time; in some places they take as much as fifteen days, or even twenty. This crop indeed is the slowest to start of all, and if after the sowing there is a long spell of wet weather, it is extremely slow.[2] Whether the sprouting[3] of crops sown at the spring seed-time is quicker because of the season is matter for enquiry.

These times of sprouting or germination must be taken generally; for at some times and places germination takes fewer days, as with barley[4] in Egypt, where it is said to come up on the third or fourth day; while elsewhere it takes longer than the period mentioned, which is not surprising when both soil and climate are different, when one makes the sowing earlier or later, and when the crop is subjected to different influences afterwards. For open light soil with a favourable[5] climate produces quick and easy growth, while soil that is sticky and heavy tends to slow growth, and that of a specially dry district to slower growth still.

Moreover the time of growth is affected, according as storms supervene, or droughts, or fine weather or again rain; for these conditions make wide differences. So too it makes a difference if the

[4] *κριθή* add. W.
[5] *εὐκράτῳ* conj. Scal. from G (*benigno caelo*); *εὐκάρπῳ* Ald.

γῆ προειργασμένη καὶ κοπρον ἔχουσα τυγχάνῃ, καὶ ἐὰν μηδὲν τούτων· ἐπεὶ καὶ περὶ τὸ πρωϊσπορεῖν ἕκαστα καὶ ὀψισπορεῖν αἱ χῶραι διαφέρουσιν. ἔνιοι δὲ καὶ περὶ τὴν Ἑλλάδα πάντα πρωϊσπορεῖν εἰώθασι διὰ ψυχρότητα τῆς χώρας, ὥσπερ οἱ Φωκεῖς, ὅπως ἂν οἱ χειμῶνες μὴ νήπια καταλαμβάνωσιν.

II. Βλαστάνει δὲ τὰ μὲν ἐκ τοῦ αὐτοῦ τὴν ῥίζαν ἀφιέντα καὶ τὸ φύλλον, τὰ δὲ ἑκάτερον ἐξ ἑκατέρου τοῦ ἄκρου. πυρὸς μὲν οὖν καὶ κριθὴ καὶ τίφη καὶ ὅλως ὅσα σιτώδη πάντα ἐξ ἑκατέρου ὥσπερ ἐν τῷ στάχυϊ πέφυκεν, ἀπὸ μὲν τοῦ κάτω τοῦ παχέος τὴν ῥίζαν ἀπὸ δὲ τοῦ ἄνω τὸν βλαστόν· ἓν δέ τι καὶ συνεχὲς γίνεται τὸ ἀμφοῖν τῆς τε ῥίζης καὶ τοῦ καυλοῦ. κύαμος δὲ καὶ τὰ ἄλλα χεδροπὰ οὐχ ὁμοίως, ἀλλ' ἐκ τοῦ αὐτοῦ τὴν ῥίζαν καὶ τὸν καυλόν, καθ' ὃ καὶ ἡ πρόσφυσις αὐτῶν ἐστι πρὸς τὸν λοβόν, ἐν ᾧ καὶ ἔχουσιν οἷον ἀρχήν τινα φανεράν· ἐπ' ἐνίων δὲ καὶ αἰδοιῶδες φαίνεται, καθάπερ ἐπὶ τῶν κυάμων καὶ τῶν ἐρεβίνθων καὶ μάλιστα τῶν θέρμων· ἐκ τούτου γὰρ ἡ μὲν ῥίζα κάτω τὸ δὲ φύλλον καὶ ὁ καυλὸς ἄνω χωρεῖ.

2 Ταύτῃ μὲν οὖν πη διαφέρει. τῇ δὲ ὁμοίως ἔχει τῷ πάντα κατὰ τὴν πρόσφυσιν τοῦ λοβοῦ καὶ τοῦ στάχυος ἀφιέναι τὴν ῥίζαν καὶ μὴ

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[1] ὡς προειργ. Ald.H.; ὡς om. Sch. from G. [2] *cf.* 8. 8. 2.
[3] ὥσπερ conj. Scal.; πάντα Ald. (? repeated by mistake). *cf.* *C.P.* 4. 7. 4.

ground has been well tilled [1] and given dung, or if neither of these things has been done: for the soil makes a difference even as to the early or late germination of each crop. In Hellas some are used to sow everything earlier because of the coldness of the soil, for instance the Phocians; [2] the object being that the winter may not overtake the crop while it is still tender.

Of differences in the mode of germination and of subsequent development.

II. In germinating some of these plants produce their root and their leaves from the same point, some separately, from either end of the seed. Wheat barley one-seeded wheat, and in general all the cereals produce them from either end, in a manner corresponding to [3] the position of the seed in the ear, the root growing from the stout lower part, the shoot from the upper part; but the part corresponding to the root and that corresponding to the stem form a single continuous whole. Beans and other leguminous plants do not grow in the same manner, but they produce the root and the stem from the same point, namely the point at which the seed is attached to the pod, which, it is plain, is a sort of starting point of fresh growth. In some cases there is also a formation resembling the *penis*, as in beans chick-peas and especially in lupins; from this [4] the root grows downwards, the leaf and the stem upwards.

There are then these different ways of germinating; but a point [5] in which all these plants agree is that they all send out their roots at the place where

[4] τούτου conj. Sch.; τούτων Ald. *cf. C.P.* 4. 7. 4.
[5] *cf. C.P.* 4. 7. 7.

καθάπερ ἐν τοῖς δενδρικοῖς τισιν ἀνάπαλιν, οἷον ἀμυγδαλῇ καρύῳ βαλάνῳ[1] τοῖς τοιούτοις. ἐν ἅπασι δὲ ἡ ῥίζα μικρῷ πρότερον ἐκφύεται τοῦ καυλοῦ· συμβαίνει δὲ ἔν γέ τισι τῶν δένδρων ὥστε τὸν μὲν βλαστὸν ἐν αὐτῷ τῷ σπέρματι βλαστάνειν πρῶτον, αὐξανομένου δὲ διΐστασθαι τὰ σπέρματα—πάντα γάρ πως καὶ ταῦτα διμερῆ, τὰ δὲ δὴ χεδροπὰ φανερῶς πάντα δίθυρα καὶ σύνθετα—τὴν δὲ ῥίζαν εὐθὺς ἔξω προωθεῖσθαι· ἐν δὲ τοῖς σιτηροῖς διὰ τὸ καθ' ἓν αὐτὰ εἶναι τοῦτο μὲν οὐ συμβαίνει, προτερεῖ δὲ ἡ ῥίζα μικρόν.

3 Ἀναφύεται δὲ ἡ μὲν κριθὴ καὶ ὁ πυρὸς μονόφυλλα, ὁ δὲ πισὸς καὶ ὁ κύαμος καὶ ὁ ἐρέβινθος πολύφυλλα. ῥίζαν δὲ ἔχει τὰ μὲν χεδροπὰ πάντα ξυλώδη καὶ μίαν ἀπὸ δὲ ταύτης καὶ ἀποφύσεις λεπτάς. βαθυρριζότατον δὲ ὡς εἰπεῖν τούτων ὁ ἐρέβινθος, ἐνίοτε δὲ καὶ παρακαθίησιν· ἀλλ' ὁ πυρὸς καὶ ἡ κριθὴ καὶ τὰ ἄλλα τὰ σιτώδη πολύρριζα καὶ λεπτόρριζα, δι' ὃ καὶ ταρρώδη. καὶ πολύκλαδα καὶ πολύκαυλα πάντα τὰ τοιαῦτα. σχεδὸν δὲ καὶ ἐναντίωσίς τις ἑκατέρων ἐστί· τὰ μὲν γὰρ χεδροπὰ μονόρριζα ὄντα πόλλας ἄνωθεν ἀπὸ τῶν καυλῶν ἀποφύσεις ἔχει πλὴν κυάμου· τὰ δὲ σιτηρὰ πολύρριζα πολλοὺς μὲν ἀνίησι

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[1] *βαλάνῳ* : *διοσβαλάνῳ* Sch. from mBod.

[2] *τισι τῶν δένδρων* conj. W.; *σιτώδεσιν* UMAld.; *τοῖς δενδρικοῖς* conj. Sch. This and W.'s other conjectures in this section are rather desperate, but are accepted provisionally as at least restoring a satisfactory sense. The passage looks as if it had been deliberately tampered with by someone who misunderstood it.

the seed is attached to the pod or ear, whereas the contrary is the case with the seeds of certain trees, as almond hazel acorn [1] and the like. And in all these plants the root begins to grow a little before the stem; whereas in certain trees [2] the bud first begins to grow within the seed itself, and, as it increases in size, the seeds split—for all such seeds are in a manner in two halves, and those of leguminous plants again all plainly have two valves and are double—and then the root is immediately thrust out; but in cereals,[3] since the seeds are in one piece,[4] this does not [5] occur, but the root grows a little before the bud.

Barley and wheat come up with a single leaf, but peas beans and chick-peas with several. [6] All the leguminous plants have a single woody root, and also slender [7] side-roots springing from this. The chick-pea is about the deepest rooting of these, and sometimes it has side-roots; but wheat barley and the other cereals have a number of fine roots, wherefore they are matted together.[8] Again all such plants have many branches and many stems. And there is a sort of contrast between these two classes; the leguminous plants, which have a single root, have many side-growths above from the stem—all except beans; while the cereals, which have many roots, send up many shoots,[9] but these have

[3] *σιτηροῖς* conj. W.; *χεδροποῖς* UMAld.
[4] *καθ' ἓν αὐτὰ* conj. W.; *κατὰ τὸ αὐτὸ* UMAld.
[5] *οὐ* conj. Scal. from G; *οὖν* UMAld.
[6] Plin. 18. 51.
[7] *λεπτάς* conj. St.; *λεπταί* Ald.H.
[8] *ταρρώδη*: *cf.* 6. 7. 4.
[9] *μὲν* conj. Sch.; *γὰρ* Ald.H.

βλαστούς, ἀπαράβλαστοι δὲ οὗτοι, πλὴν εἴ τι γένος πυρῶν τοιοῦτον, οὓς καλοῦσι σιτανίας καὶ κριθανίας.

4 Τὸν μὲν οὖν χειμῶνα ἐν τῇ χλόῃ μένει τὰ σιτώδη, διαγελώσης δὲ τῆς ὥρας καυλὸν ἀφίησιν ἐκ τοῦ μέσου καὶ γονατοῦται. συμβαίνει δ' εὐθὺς ἐν τῷ τρίτῳ γόνατι, τοῖς δὲ ἐν τῷ τετάρτῳ, καὶ τὸν στάχυν ἔχειν ἀλλ' οὐ φανερὸν ἐν τῷ ὄγκῳ·—γίνεται δὲ ἐν τῷ ὅλῳ καλάμῳ πλείω τούτων·—ὥστε σχεδὸν ἅμα τῷ καλαμοῦσθαι συνίστασθαι <ἢ> μικρὸν ὕστερον· ἀλλ' οὐ πρότερον φανερὸς γίνεται πρὶν ἂν προαυξηθεὶς ἐν τῇ κάλυκι γένηται, τότε δὲ ἡ κύησις φανερὰ διὰ τὸν ὄγκον.

5 Ἀπολυθεὶς δ' εὐθὺς ἀνθεῖ μεθ' ἡμέρας τέτταρας ἢ πέντε καὶ πυρὸς καὶ κριθὴ καὶ ἀνθεῖ σχεδὸν τὰς ἴσας, οἱ δὲ τὰς πλείστας λέγοντες ἐν ταῖς ἑπτά φασιν ἀπανθεῖν. ἀλλὰ τῶν χεδροπῶν χρόνιος ἡ ἄνθησις· χρονιωτάτη δὲ τῶν μὲν ἄλλων ὀρόβου καὶ ἐρεβίνθου, τούτων δ' ἁπάντων τοῦ κυάμου καὶ ἐν μεγίστῃ διαφορᾷ· τετταράκοντα γὰρ ἡμερῶν ἀνθεῖν λέγουσι· πλὴν οἱ μὲν ἀεὶ παρανθοῦντος ἑτέρου καὶ ἑτέρου λέγουσι, κατὰ μέρος γὰρ ἀνθεῖν, οἱ δὲ ἁπλῶς. ἡ γὰρ ἄνθησις τῶν μὲν σταχυηρῶν ἀθρόως τῶν δὲ ἑλλοβωδῶν καὶ χεδροπῶν πάντων κατὰ μέρος· πρῶτα γὰρ ἀνθεῖ τὰ κάτω, καὶ ὅταν ταῦτα ἀπανθήσῃ τὰ ἐχόμενα, καὶ οὕτως αἰεὶ βαδίζει πρὸς τὰ ἄνω.

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[1] Plin. 18. 52. [2] Plin. 18. 56.
[3] *cf.* 7. 7. 1; 8. 4. 3.

no side-shoots—except such sorts of wheat as are called *sitanias* and *krithanias* ('barley-wheat').

[1] During winter cereals remain in the blade, but, as the season begins to smile, they send up a stem from the midst and it becomes jointed. [2] And it comes to pass that the ear also at once appears in the third, or in some cases in the fourth joint, though it is not distinctly seen in the mass of growth (the whole stem contains more joints than three or four), so that it must be formed at the same time that the straw grows or but a little later; though it does not become conspicuous till it has first swollen and formed in the sheath,[3] and by that time its size makes its development visible.

Four or five days after being set free[4] wheat and barley flower and remain in bloom for a like number of days; those who put the period at the longest say that the bloom is shed in seven days. [5] On the other hand the flowering period of leguminous plants lasts a long time; that of vetch and chick-pea is longer than that of most, but that of the bean is far longer than that of any of them; they say that it is in bloom for forty days; some however give this period absolutely, others say that at different times different parts are in flower,[6] since the whole plant does not flower at once. For plants with an ear bloom all at once, but plants with pods and all leguminous plants bloom part at a time; the lower part blooms first, and, when this bloom has fallen, the part next above it, and so on up to the top.

[4] Sc. from the sheath. ἀπολυθεὶς Ald.H.; ἀποχυθεὶς conj. Sch. followed by W. *cf.* ἀπόχυσις 8. 3. 4.

[5] Plin. 18. 59.

[6] παρανθοῦντος conj. H.; παρανθοῦντες Ald.

δι' ὃ πολλὰ τῶν ὀρόβων τίλλεται τὰ μὲν κάτω κατερρυηκότα τὰ δ' ἄνω χλωρὰ πάμπαν.

6 Μετὰ δὲ τὴν ἀπάνθησιν ἁδρύνονται καὶ τελειοῦνται πυρὸς μὲν καὶ κριθὴ τετταρακοσταῖα μάλιστα· παραπλησίως δὲ καὶ τίφη καὶ τἆλλα τὰ τοιαῦτα. τετταρακοσταῖον δέ φασι καὶ τὸν κύαμον, ὥστε ἐν ἴσαις ἀνθεῖν καὶ τελειοῦσθαι· τὰ δ' ἄλλα ἐν ἐλάττοσιν· ἐλαχίσταις δὲ ὁ ἐρέβινθος, εἴπερ ἀπὸ τῆς σπορᾶς ἐν τετταράκοντα τελειοῦται ταῖς ἁπάσαις ὥσπερ τινές φασιν· ἐπεὶ τό γ' ὅλον ὅτι τάχιστα φανερόν. οἱ δὲ κέγχροι καὶ τὰ σήσαμα καὶ οἱ μέλινοι καὶ ὅλως τὰ θερινὰ σχεδὸν ὁμολογεῖται τὰς τετταράκονθ' ἡμέρας λαμβάνειν· οἱ δέ φασι καὶ ἐλάττους.

7 Διαφέρει δὲ καὶ πρὸς τὴν τελείωσιν χώρα τε χώρας καὶ ἀὴρ ἀέρος· ἐν ἐλάττοσι γὰρ ἔνιαι δοκοῦσιν ἐκφέρειν, ὥσπερ ἄλλαι τε καὶ μάλιστα ἐπιδήλως Αἴγυπτος· ἐκεῖ γὰρ κριθαὶ μὲν ἐν ἑξαμήνῳ πυροὶ δὲ ἐν τῷ ἑβδόμῳ θερίζονται· περὶ δὲ τὴν Ἑλλάδα κριθαὶ μὲν ἐν τῷ ἑβδόμῳ παρὰ δὲ τοῖς πλείστοις ὀγδόῳ, πυροὶ δὲ ἔτι προσεπιλαμβάνουσιν. οὐ μὴν οὐδὲ ἐκεῖ τό γε πᾶν πλῆθος οὕτως, ἀλλ' ὅσον εἰς ἀπαρχήν· κομίζεται γὰρ πρὸς ἱερῶν τινῶν χρείαν ἄλφιτα νέα τῷ ἕκτῳ μηνὶ καὶ ταῦτα ἐκ τῶν ἄνω τόπων ὑπὲρ Μέμφιν.

8 Λέγεται δὲ καὶ ἐν Σικελίᾳ τῆς Μεσσηνίας ἐν

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[1] μέλινοι Ald.H.; ἕλυμοι Vo.Vin. *cf.* 8. 1. 1 n.

Wherefore, at the time when some of the vetches are gathered, the lower seeds have already fallen, while the upper ones are still quite green.

After the flowering is over wheat and barley develop and mature in about forty days; one-seeded wheat and other such plants take about the same time. So too, they say, does the bean, which blooms and matures in a like number of days: but the others take fewer, and fewest of all the chick-pea, since, as some say, it takes only forty days from the time when it is sown to that when it is mature; and in any case it is clear that the plant as a whole develops very rapidly. Millet sesame Italian millet[1] and the summer crops in general, it is fairly well agreed, take the same number of days, that is, forty; though some say that they take less.

Of differences in development due to soil or climate.

[2] Again as to the development of the plant there are differences according to soil and climate. Some soils seem to produce the crop in fewer days; for instance, Egypt may be given as a specially conspicuous example; in that country barley is reaped in six months and wheat in seven: while in Hellas the barley[3] harvest is in the seventh month, or in most parts in the eighth, and wheat requires an even longer time. However even in Egypt the whole harvest is not gathered at such an early date, but only what is required for the first-fruits; for they gather new grain for the meal required in certain sacrifices in the sixth month, and that too in the regions high up the Nile, above Memphis.

It is said also that in the Messenian district in

[2] Plin. 18. 49. [3] κριθαὶ conj. Sch.; πυροὶ UMAld.

ταῖς καλουμέναις Μύλαις ταχεῖάν τινα γίνεσθαι τὴν τελείωσιν τῶν ὀψίων· τὸν τῶν ὀσπρίων μὲν γὰρ σπορητὸν ἐξ μῆνας, τὸν δὲ τῷ ὑστάτῳ σπείραντα θερίζειν ἅμα τοῖς πρώτοις· ἀγαθὴν δὲ διαφερόντως εἶναι τὴν χώραν, ὥστε τριακοντάχοα ποιεῖν, ἔχειν δὲ καὶ νομὰς θαυμαστὰς καὶ ὕλην. ἐν Μήλῳ δέ τι θαυμασιώτερον λέγουσιν· ἐν γὰρ τριάκοντα ἢ τετταράκοντα ἡμέραις σπαρέντα θερίζουσι, δι' ὃ καὶ λέγειν αὐτοὺς ὅτι μέχρι τούτου δεῖ σπείρειν ἕως ἂν ἴδῃ τις δράγμα· γίνεσθαι δὲ οὔτε ὄσπρια τοιαῦτα οὔτε πολλὰ παρ' αὐτοῖς. δεινὴν δέ τινα διαδοῦναι τὴν χώραν τροφήν· καὶ γὰρ εἶναι σιτοφόρον μὲν καὶ ἐλαιοφόρον ἀγαθὴν ἀμπελοφόρον δὲ μετρίαν.

9 Ὑπερβάλλον δ' ἔτι τούτου καὶ πάντων θαυμασιώτερον τὸ περὶ Χαλκίαν τὴν νῆσον τὴν Ῥοδίων γινόμενον· ἐκεῖ γάρ φασιν εἶναί τινα τόπον πρῴϊον οὕτω καὶ εὔφορον ὡς σπαρεισῶν κριθῶν ἅμα ταῖς ἄλλαις θερίσαντες ταύτας σπείρουσιν εἶτα πάλιν, εἶτα θερίζουσιν ἅμα τοῖς λοιποῖς· μεγίστη μὲν οὖν, εἴπερ ἀληθής, αὕτη διαφορά. τὸ γὰρ εἰς ἑτέραν χώραν μετενεχθέντα διαφέρειν, ὥσπερ ἐκ Κιλικίας φασὶν εἰς Καππαδοκίαν καὶ ὅλως τὴν ἐπέκεινα τοῦ Ταύρου, ἧττον ἄτοπον· φανερὰ γὰρ ἡ τῶν τόπων διάστασις.

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[1] τριακοντάχοα conj. Sch.; τριάκοντα χοᾶς Ald.
[2] *cf. C.P.* 4. 11. 8.

Sicily at the place called Mylae the late sown crops mature rapidly; thus the sowing of pulses goes on for six months, but he that made the last sowing gathers his crop at the same time as the first: also that the soil is exceedingly good, so that it yields thirty-fold[1]; and there are also wonderful pastures and forest-land. They tell of an even more wonderful thing in Melos[2]; there they reap thirty or forty days after sowing; wherefore it is a saying of the islanders that "one should continue sowing till one sees a swathe." However it is said that pulses[3] in their country do not grow like this, nor are they abundant. Yet they say that the soil is wonderfully productive; for it is good both for corn and olives, and fairly good for vines.

However what occurs in Chalkia,[4] an island belonging to the Rhodians, goes even beyond this and is more extraordinary than all the instances given; there they say that there is a place which is so early and so fertile that, when the barley is sown after reaping the crop with the other crops, they then sow again, and then reap the crop thus sown at the same time as the remaining crops; this then, if it be true, marks a difference greater than we find anywhere else. For it is less surprising that there should be a difference in crops transferred[5] to another region, as they say occurs when they are transferred from Cilicia to Cappadocia or in general beyond the Taurus; for these regions are obviously very dissimilar.

[3] *ὅσπρια τοιαῦτα* I conj.; *ὄψιμα ταῦτα* UAld.; *ἔψιμα ταῦτα* M.G; P omits *ταῦτα*.

[4] *cf.* Thuc. 8. 41 foll.

[5] *μετενεχθέντα διαφέρειν* conj. Sch. and W. from G; *μετεγκόντας σπείρειν* Ald.

10 Τὸ δὲ τὴν αὐτὴν διφορεῖν, ἐν ᾧπερ γε ἅπαξ αἱ ἄλλαι, σύνορον οὖσαν καὶ μίαν θαυμασιώτατον· αὕτη μὲν οὖν ἐν μεγίστῃ διαφορᾷ.

Τὰ δὲ κατὰ τὰς ἄλλας χώρας οὐ πολλὴν ἢ οὐδεμίαν ὡς εἰπεῖν τοῦ γε χρόνου λαμβάνει διάστασιν· προτερεῖ γὰρ ταῖς ὥραις τὰ Ἀθήνησι τῶν περὶ Ἑλλήσποντον ἡμέραις τριάκοντα μάλιστα ἢ οὐ πολλῷ πλείοσιν· εἰ μὲν οὖν καὶ ὁ σπορητὸς πρότερον, μετάθεσις ἂν εἴη τῆς ὥρας· εἰ δ' ἅμα, δῆλον ὅτι πλείων ἂν ὁ χρόνος.

11 Οὐ μικρὰν δὲ ποιοῦσι διαφορὰν οὐδὲ οἱ τόποι, καίπερ ἔνιοι συνεγγὺς ὄντες· τὰ γὰρ ἐν Σαλαμῖνι προτερεῖ πολὺ τῶν ἄλλων τῶν ἐν τῇ Ἀττικῇ καὶ ὅλως τὰ ἐπιθαλάττια καὶ εἰς ταῦτα καὶ εἰς τοὺς ἄλλους καρπούς, ὡς τὰ περὶ τὴν Ἀκτὴν καλουμένην τῆς Πελοποννήσου καὶ τὰ ἐν Φαλύκῳ τῆς Μεγαρίδος· πλὴν ἐνταῦθά γε συμβάλλεται καὶ τὸ λεπτόγεων εἶναι καὶ ψαφαρὰν τὴν χώραν. καὶ τὰ μὲν περὶ τὴν γένεσιν καὶ τὴν τελείωσιν οὕτως ἔχει.

III. Διαφέρει δὲ καθ' ὅλα τὰ γένη τὰ διῃρημένα τῶν γενῶν, οἷον σῖτος χεδροπὰ τὰ θερινά, καὶ καθ' ἕκαστον γένος τὰ ὁμογενῆ. τὰ μὲν γὰρ σιτώδη τὸ φύλλον ἔχει καλάμου, τῶν δὲ χεδρο-

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[1] *i.e.* and so in part account for the difference. εἴη τῆς ὥρας conj. Sch.; ᾗ τῆς χώρας MP; εἴη τῆς χώρας Ald.H.

[2] *i.e.* we cannot say how far the difference is due to climate without knowing whether the seed-time at either place is the same.

But that one particular land should produce two crops in the time that other lands to which it is close take to produce one, is very remarkable; wherefore Chalkia exhibits the greatest difference.

The crops grown in other regions show not much, if any, dissimilarity as to time; those grown at Athens are only about thirty days or not much more before those of the Hellespont region. Now, if the sowing should turn out to be also earlier, that would shift the season back[1]; if it is at the same time, it is plain that the difference of time would be greater.[2]

Again the particular district makes a considerable difference, even as between places which are not far apart; thus the crops of Salamis are far earlier than those of the rest of Attica, and so in general are those of places by the sea; and this applies to other fruits as well as these: for instance, those of the place called Akte in the Peloponnese and of Phalykos[3] in the Megarid are early; but here something is contributed by the fact that the soil is light and crumbling. Such are the facts in regard to growth and development.

Of differences between the parts of cereals, pulses, and summer crops respectively.

III. There are also differences between[4] the whole classes which we have mentioned, namely cereals leguminous plants[5] and summer crops, as well as between the several members[6] of the same class. Cereals have the leaf of a reed, while of

[3] *ἐν Φαλύκῳ* I conj.: *cf.* 2. 8. 1; *ἐν Φαλήκῳ* conj. W.; *ἐφαλύκῳ* U; *ἐκ φαλήκῳ* M; *ἐκ φαλήκου* Ald.

[4] *καθ'* conj. Sch.; *καὶ* Ald.H. [5] *cf.* 8. 1. 1.

[6] *δμογενῆ* conj. Sch.; *δμοιογενῆ* Ald.

πῶν τὰ μὲν περιφερές, οἷον ὁ κύαμος καὶ σχεδὸν τὰ πλεῖστα, τὰ δὲ προμηκέστερον, οἷον ὁ πισὸς καὶ ὁ λάθυρος καὶ ὁ ὦχρος καὶ τὰ τοιαῦτα. καὶ τὰ μὲν ἰνώδη τὰ δ' ἄφλεβα καὶ ἄϊνα. τὸ δὲ σήσαμον καὶ τὸ ἐρύσιμον ἰδιώτερα παρὰ ταῦτα.

2 Πάλιν ὁ καυλὸς τῶν μὲν γονατώδης καὶ κοῖλος, δι' ὃ καὶ καλεῖται κάλαμος· ὁ δὲ τοῦ κυάμου κοῖλος, τῶν δ' ἄλλων χεδροπῶν ξυλωδέστερος, ξυλωδέστατος δὲ ὁ ἐρέβινθος· τῶν δὲ θερινῶν κέγχρου μὲν καὶ μελίνου καλαμώδης, σησάμου δὲ καὶ ἐρυσίμου ναρθηκώδης μᾶλλον. καὶ τὰ μέν ἐστιν ὀρθόκαυλα, καθάπερ πυρὸς καὶ κριθὴ καὶ ὅλως τὰ σιτώδη καὶ θερινά, τὰ δὲ πλαγιόκαυλα μᾶλλον, οἷον ἐρέβινθος ὄροβος φακός, τὰ δ' ἐπιγειόκαυλα, καθάπερ ὦχρος πισὸς λάθυρος· ὁ δὲ δόλιχος, ἐὰν παρακαταπήξῃ τις ξύλα μακρά, ἀναβαίνει καὶ γίνεται κάρπιμος, εἰ δὲ μή, φαῦλος καὶ ἐρυσιβώδης· μόνος δ' ἡ μάλιστα τῶν χεδροπῶν ὀρθόκαυλος ὁ κύαμος.

3 Ἔχει δὲ καὶ τὰ ἄνθη διαφορὰν καὶ τῇ φύσει καὶ τῇ θέσει, περὶ ὧν σχεδὸν ἐν τοῖς καθ' ὅλου διείλομεν, ὅτι τὰ μὲν χνοώδη, καθάπερ σίτου καὶ παντὸς τοῦ σταχυώδους· τὰ δὲ φυλλώδη, καθάπερ τῶν χεδροπῶν, καὶ τῶν πλείστων κολοβά·

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[1] Plin. 18. 58. [2] *i.e.* 'summer crops'; *cf.* 8. 1. 1.
[3] Sc. but not jointed. W. suggests that the original text may have been *τῶν δὲ διόλου κοῖλος οἷον ὁ τοῦ κυάμου.*
[4] *μελίνου* Ald.H.; *ἐλύμου* V; *ἑλύμου* Vin. *cf.* 8. 1. 1; 8. 1. 6.
[5] *ἡ* add. St.; om. Ald.H.G. [6] 1. 13. 1 (?)
[7] *χνοώδη.* No rendering seems quite satisfactory: the

leguminous plants some have a round leaf, as beans and most others, some a more oblong leaf, as pea *lathyros okhros* and the like. [1] Some again have fibrous leaves, others leaves without veins and fibres. Again sesame [2] and *erysimon* [2] have leaves quite distinct from these.

Again the stem of cereals is jointed and hollow; wherefore it is called the 'reed,' while that of the bean is hollow,[3] and that of the other leguminous plants is more woody, that of chick-pea woodiest of all; of the summer crops that of millet and Italian millet [4] is reed-like, that of sesame and *erysimon* is more like the stem of ferula. Some again have erect stems, as wheat barley and in general the cereals and summer crops; some have rather a crooked stem, as chick-pea vetch lentil; some a creeping stem as *okhros* pea *lathyros*; while calavance, if long stakes are set by it, climbs them and becomes fruitful, whereas otherwise the plant is unhealthy and liable to rust; the bean, most of all leguminous plants, if not [5] alone among them, has an erect stem.

The flowers also shew differences in character and in position (of which matters we have to some extent treated in our general account) [6]; thus some are 'downy,' [7] as those of corn [8] and of any plant that has an 'ear'; others are 'leafy,' [9] as those of leguminous plants, and in most cases they are irregular [10] flowers; for most of these have

meaning is that such flowers may be classed with those distinguished by this term in 1. 13. 1, as not being petaloid.

[8] *σίτου καὶ παντὸς τοῦ σταχυώδους* conj. Sch. from G, *ut omnium fere gerentium spicam*; *που καὶ παντὸς τοῦ χυλώδους* UMAld.

[9] Sc. petaloid.

[10] *cf.* 6. 5. 3. *i.e.* they depart from radial symmetry.

τὰ γὰρ πολλὰ κολοβανθῆ· χνοῶδες δὲ καὶ τὸ τοῦ κέγχρου καὶ μελίνου τοῦ δὲ σησάμου καὶ τοῦ ἐρυσίμου φυλλῶδες. καὶ ὅτι δὴ τὰ μὲν ἔχει περὶ αὐτὸν τὸν καρπόν, οἷον τὰ σιτώδη καὶ κεγχρώδη περὶ τὸν στάχυν· τὰ δὲ χεδροπὰ ἐξ αὐτοῦ πως τοῦ ἄνθους ἢ ἀπό γε τῆς αὐτῆς ἀρχῆς γίνεται. καὶ τὴν ἄνθησιν, ὅτι τὰ μὲν ἀθρόαν τὰ δὲ κατὰ μέρος ποιεῖται· καὶ τἆλλα δὲ τὰ παραπλήσια τούτοις.

4 Ὁμοίως δὲ καὶ τὰ κατὰ τοὺς καρπούς, ὅτι τὰ μὲν ἔχει στάχυν, τὰ δὲ χεδροπὰ λοβόν, τὰ δὲ κεγχρώδη φόβην· ἡ δὲ καλαμώδης ἀπόχυσις φόβη. τὸ δ' ὅλον ἐναγγειόσπερμα, τὰ δὲ ἐνυμενόσπερμα, τὰ δὲ γυμνόσπερμα· καὶ ἔτι τὰ μὲν ἀκρόκαρπα, τὰ δὲ πλαγιόκαρπα, καὶ ὅσα δὴ ἄλλα ταύτης ἔχεται τῆς θεωρίας.

Ὅλως δὲ πολυκαρπότερα καὶ πολυχούστερα τὰ χεδροπά, τούτων δ' ἔτι μᾶλλον τὰ θερινὰ κέγχρος καὶ σήσαμον, αὐτῶν δὲ τῶν χεδροπῶν
5 μάλιστα φακός. ἁπλῶς δὲ τὰ μικροσπερμότερα μᾶλλον ὡς εἰπεῖν, ὥσπερ καὶ τῶν λαχανωδῶν κύμινον ἁπάντων ὄντων πολυσπέρμων. ἰσχυρότερα δὲ πρὸς μὲν τὸν χειμῶνα καὶ ὅλως τὰ τοῦ ἀέρος τὰ σιτηρά, ποὸς δὲ τὴν τροφὴν τὰ

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[1] μελίνου Ald.H.; ἐλύμου Vo.Vin. *cf.* 8. 3. 2 and reff.
[2] *cf.* 8. 3. 3 n. [3] Plin. 18. 53.
[4] ἀπόχυσις conj. Sch. from G; ἀπόφυσις P_2Ald. *cf.* 4. 4. 10, ἀποχεῖται; 8. 10. 4; *C.P.* 3. 21. 5.
[5] τὸ δ' ὅλον: ? τὰ δ' οἷον.

such flowers. Those of millet and Italian millet[1] are also 'downy,'[2] those of sesame and *erysimon* 'leafy.' Another difference is that in some cases the flowers are round the fruit; thus those of corn and millet are round the ear; while in leguminous plants the fruit comes as it were from the flower itself, or at least from the same starting-point. Another difference is that some produce all their flowers at once, others in succession. And there are other differences akin to these.

In like manner there are differences in the fruits; some have an 'ear,' leguminous plants a pod, and millet-like plants a 'plume'[3]—which is the name given to an inflorescence[4] such as reeds have. Again, generally speaking,[5] some have their seeds in a vessel,[6] some in pods,[7] some naked; and further some bear their fruit at the top, some at the sides; and there are other differences which bear on this enquiry.

In general the leguminous plants produce more fruit and are more prolific, and the summer crops millet and sesame are even more so than these, while among the leguminous plants themselves lentil is the most prolific. [8] Generally speaking, those that have small seeds are more prolific, as cummin among pot-herbs, which are all prolific of seed. The seeds of cereals are more robust as to standing winter and conditions of climate generally, while those of leguminous plants are stronger as to providing food. [9] However it may be that in this respect

[6] μὲν ἐναγγειόσπερμα conj. Sch.; μὲν ἐγγειόσπερμα P_2Ald. *cf. C.P.* 4. 7. 5.

[7] *cf.* 1. 11. 2. [8] *cf. C.P.* 4. 15. 2.

[9] *i.e.* what has just been said perhaps applies only to *human* food. Sense fixed by 8. 9. 3 *ad fin.*: *cf.* Plin. 18. 50.

χεδροπά. τάχα δὲ τοῦτό γε ἡμῖν τοῖς ἄλλοις ἀνάπαλιν.

IV. Τὰ μὲν οὖν ὅλα γένη τοιαύτας ἔχει διαφοράς· τὰ δὲ ὁμογενῆ δῆλον ὅτι κατὰ τὴν τῶν μερῶν ἀνωμαλίαν, οἷον τῶν σιτωδῶν πυρὸς κριθῆς στενοφυλλότερον καὶ λειοκαυλότερον καὶ πυκνότερον καὶ γλισχρότερον ἔχει τὸν καυλὸν καὶ δυσθλαστότερον· ἅμα δὲ καὶ ὁ μὲν ἐν χιτῶσι πολλοῖς ἡ δὲ γυμνόν· μάλιστα γὰρ δὴ γυμνοσπέρματον ἡ κριθή. πολύλοπον δὲ καὶ ἡ τίφη καὶ ἡ ὀλύρα καὶ πάντα τὰ τοιαῦτα καὶ μάλιστα πάντων ὡς εἰπεῖν ὁ βρόμος. ἔστι δὲ καὶ ὑψηλότερος ὁ κάλαμος τοῦ πυροῦ ἢ τῆς κριθῆς, καὶ τὸν στάχυν ἀπηρτημένον ἔχει τοῦ φύλλου μᾶλλον ὁ πυρός.

Ἴδιον δὲ καὶ τὸ ἄχυρον τοῦ κριθίνου τὸ πύρινον· ἐγχυλότερον γὰρ καὶ μαλακώτερον. διαφέρει δὲ
2 ἡ κριθὴ καὶ τούτῳ τῶν πυρῶν· ἡ μὲν γὰρ στοιχειώδης, ὁ δὲ πυρὸς ἄστοιχος καὶ πανταχόθεν ὁμαλής τις.

Τῷ μὲν οὖν ὅλῳ γένει πρὸς γένος τοιαῦταί τινές εἰσι διαφοραί. καθ' ἑκάτερον δὲ τούτων πάλιν, οἷον πυρῶν καὶ κριθῶν, πολλὰ γένη καὶ τοῖς καρποῖς αὐτοῖς διαφέροντα καὶ τοῖς στάχυσι καὶ ταῖς ἄλλαις μορφαῖς καὶ ἔτι ταῖς δυνάμεσι

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[1] *cf.* 7. 4. 9.

[2] After διαφορὰς UM add *τὰ ὁμοιογενῆ*, Ald. *τὰ μὴ ὁμοιογενῆ*; om. Sch. and W. after G.

[3] *ὁμογενῆ* conj. Sch.; *ὁμοιογενῆ* UMAld. *cf.* 8. 3. 1.

[4] *δυσθλαστότερον* conj. Scal. from G, *ruptu difficiliorem*; *δυσαλθατώτερον* UMAld.

[5] Plin. 18. 61. *πολύλοπον* conj. Salm.; *πολύλοβον* Ald.

the other animals are affected in the opposite[1] way to men.

Of the differences between cereals.

IV. There are then these differences[2] between the various classes; and as between plants of the same class[3] there are plainly differences due to the unlikeness in the various parts. Thus among cereals wheat as compared with barley has a narrower leaf, and a smoother stem of closer texture tougher and less brittle.[4] Again the seed of wheat has several coats,[5] that of barley is naked, that plant having its seeds specially naked. Also one-seeded wheat rice-wheat and all such plants have their seed in several coats, and above all, it may be said, is this true of oats.[6] Also the 'reed' of wheat is taller than[7] that of barley, and wheat has its ear less distant from the 'leaf.'

Further the husk of wheat is distinct[8] from that of barley, being less dry and softer. Barley also differs from wheat in this respect; it has grains in a regular row,[9] whereas those of wheat are not in a row, but the ear is as it were quite simple in form.[10]

Such then are the differences as between one whole kind and another. But in each of these kinds again, for instance in barley and wheat, there are many sub-divisions differing both in the actual fruits, in the ear, and in the other characteristic

[6] *βρόμος* conj. Scal. from Plin. *l.c.* and G; *κρόμος* PM; *κρόκος* Ald.; *βρῶμος* Vin.

[7] *ἢ* conj. Sch. from Plin. *l.c.* and G; *καὶ* Ald.H.

[8] *ἴδιον* Ald.; *ἥδιον* Vin.H. from G: so Sch. and W. *cf.* Col. 6. 3. 3.

[9] *στοιχειώδης*. ? *στοιχώδης*: *v.* LS.

[10] *δμαλὴς* conj. Sch.; *ὁμαλὴ* UMAld.

καὶ τοῖς πάθεσι. τῶν μὲν κριθῶν αἱ μέν εἰσι δίστοιχοι αἱ δὲ τρίστοιχοι αἱ δὲ τετράστοιχοι καὶ πεντάστοιχοι· πλεῖστον δ' ἑξάστοιχον, καὶ γὰρ τοιοῦτό τι γένος ἐστί. πυκνότεραι δὲ ἀεὶ κατὰ τὴν θέσιν ὡς ἐπὶ πᾶν αἱ πολυστοιχότεραι. διαφορὰ δὲ μεγάλη καὶ τὸ παραβλαστητικὴν εἶναι, καθάπερ εἴπομεν τὴν Ἰνδικήν. καὶ οἱ στάχυες δὲ τῶν μὲν μεγάλοι καὶ μανότεροι ταῖς κριθαῖς τῶν δὲ ἐλάττους καὶ πυκνότεροι, καὶ ἀπέχοντες δὲ τοῦ φύλλου τῶν μὲν πολὺ τῶν δὲ μικρόν, ὥσπερ τῶν Ἀχιλλείων καλουμένων. καὶ αὐτῶν δὲ τῶν κριθῶν αἱ μὲν στρογγυλότεραι καὶ ἐλάττους αἱ δὲ προμηκέστεραι καὶ μείζους καὶ μανότεραι κατὰ τὸν στάχυν. ἔτι δὲ αἱ μὲν λευκαί, αἱ δὲ μέλαιναι καὶ ἐπιπορφυρίζουσαι, αἵπερ καὶ πολυάλφιτοι δοκοῦσιν εἶναι καὶ πρὸς τοὺς χειμῶνας δὲ καὶ τὰ πνεύματα καὶ ὅλως τὸν ἀέρα τῶν λευκῶν ἰσχυρότεραι.

3 Πολλὰ δὲ γένη καὶ τῶν πυρῶν ἐστιν εὐθὺς ἀπὸ τῶν χωρῶν ἔχοντα τὰς ἐπωνυμίας, οἷον Λιβυκοὶ Ποντικοὶ Θρᾷκες Ἀσσύριοι Αἰγύπτιοι Σικελοί. διαφορὰς δὲ καὶ ταῖς χροιαῖς καὶ τοῖς μεγέθεσι καὶ τοῖς εἴδεσι καὶ ταῖς ἰδιότησιν ἔχουσι καὶ ἐν ταῖς δυνάμεσι ταῖς τε ἄλλαις καὶ μάλιστα ταῖς πρὸς τὴν σίτησιν. τινὲς καὶ ἀπ'

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[1] Explained below, 8. 4. 4; *cf.* 8. 4. 3.

[2] πάθεσι: *cf.* 1. 1. 1 n. [3] Plin. 18. 78.

[4] πλεῖστον δ' ἑξάστοιχον, καὶ γὰρ τοιοῦτο conj. W.; πλεῖστον ἑξάστοιχον τοιοῦτον UM; πλεῖσται καὶ ἑξάστιχοι· καὶ γὰρ τοιοῦτον Ald. H.

features; and again in capacities[1] and properties.[2] [3] Of barley different sorts have respectively two, three, four, and five rows of seeds; the largest number[4] known is six, for there is a kind which bears that number. And those which have more rows have generally the grains set closer together. Another great difference is that of having side-shoots, as we said of the Indian kind.[5] Again in barley[6] the ears are in some kinds large and of looser make, in some smaller and set closer; in some kinds the ear is some way from the 'leaf,' in some it is nearer to it, as in the kind called 'Achillean.'[7] Again of the grains themselves some are rounder and smaller, some more oblong and larger and set at wider intervals on the ear. Moreover some are white, some black or reddish, and the latter are thought to produce much meal and to be more robust than the white as to bearing winter wind or conditions of climate generally.

There are[8] also many kinds of wheat which take their names simply from the places where they grow,[9] as Libyan Pontic[10] Thracian Assyrian Egyptian Sicilian. They show differences[11] in colour size form and individual character, and also[12] as regards their capacities[13] in general and especially their value as food. Some again get

[5] Referred to 4. 4. 9, but without mention of this feature.
[6] *ταῖς κριθαῖς* conj. W.; *τῆς κριθῆς* Ald.
[7] *cf. C.P.* 3. 21. 3; 3. 22. 2.
[8] *ἐστιν εὐθὺς* conj. W.; *εὐθύς ἐστιν* Ald.
[9] *cf. C.P.* 3. 21. 2; Plin. 18. 2.
[10] *Ποντικοὶ* conj. Sch.; *πόντιοι* Ald.
[11] *διαφορὰς* conj. W.; *διαφέροντες* Ald. H.
[12] *καὶ* conj. W.; *δὲ* Ald.
[13] Explained below, 8. 4. 4: pace of growth.

ἄλλων τὰς προσηγορίας, οἷον καγχρυδίας στλεγγὺς[1] Ἀλεξάνδρειος· ὧν ἁπάντων ἐν τοῖς εἰρημένοις τὰς διαφορὰς ληπτέον. οὐχ ἥκιστα δ' οἰκεῖαι εἴ τις λαμβάνοι τὰς τοιαύτας· οἷόν εἰσιν οἱ μὲν πρῴϊοι οἱ δὲ ὄψιοι, καὶ εὐαυξεῖς καὶ πολύχοι οἱ δὲ <μικροὶ>[4] καὶ ὀλιγόχοι, καὶ μεγαλοστάχυες οἱ δὲ μικροστάχυες. καὶ οἱ μὲν ἐν κάλυκι πολὺν χρόνον οἱ δ' ὀλίγον ἔνοντες, ὥσπερ ὁ Λιβυκός. καὶ κάλαμον οἱ μὲν λεπτὸν οἱ δὲ παχύν· καὶ τοῦτο ὁ Λιβυκὸς ἔχει, παχὺν δὲ καὶ ὁ καγχρυδίας. ἔτι δὲ χιτῶνας οἱ μὲν ὀλίγους οἱ δὲ πολλούς, ὥσπερ ὁ Θρᾴκιος. καὶ ὁ μὲν μονοκάλαμος ὁ δὲ πολυκάλαμος, καὶ μᾶλλον δὲ καὶ ἧττον.

4 Ὁμοίως δὲ καὶ εἴ τι παραπλήσιον τούτοις ἢ τοῖς πρότερον εἰρημένοις κατὰ τὰς δυνάμεις. αἱ γὰρ τοιαῦται φυσικώτατα δόξαιεν ἂν εἶναι τῶν διαφορῶν. ἐν αἷς καὶ τὸ τῶν τριμήνων καὶ τὸ τῶν διμήνων καὶ εἴ τι γένος ἐν ἐλάττοσιν ἡμέραις τελειοῦται, καθάπερ φασὶν εἶναι περὶ τὴν Αἰνείαν, οἳ τετταράκοντα ἡμέραις ἀπὸ τῆς σπορᾶς ἀδρύνονται καὶ τέλος ἴσχουσιν· εἶναι δ' ἰσχυρὸν τοῦτον καὶ βαρὺν οὐχ ὥσπερ τὸν τρίμηνον κοῦφον, δι' ὃ καὶ τοῖς οἰκέταις παρέχειν, καὶ γὰρ οὐδὲ πίτυρον ἔχειν πολύ. σπανιώτατος μὲν οὖν καὶ τάχιστος εἰς τελείωσιν

[1] στλεγγύς. Sir W. Thiselton-Dyer conjectures σίλιγνις: *cf.* Plin. 18. 184, LS. σιλίγνιον.

[2] *cf. Geop.* 3. 3. 11.

[3] *i.e.* colour, size, etc.

[4] μικροὶ add. W. to correspond to εὐαυξεῖς (conj. Sch.; εὐαξεῖς Ald.).

their distinctive names for other reasons, as *kankhrydias stlengys*[1] 'Alexandrian'[2]; all of which must be distinguished by the above-mentioned[3] characters. Again, if one takes such differences as the following, they are quite characteristic—thus some are early, some late, some are vigorous and prolific, some are small[4] and produce little, some have a large, some a small ear. The ears of some remain[5] a long time in the sheath,[6] of some it remains but a short time, as that of the Libyan kind. [7] Again some have a slender, some a stout haulm; the Libyan kind has this characteristic also, and that of *kankhrydias* is also stout. Again the grain of some has few coats,[8] of some many, for instance the Thracian.[9] Some kinds have a single 'reed,' some more than one, and in the latter class the number varies.

[10] So too must we distinguish any differences like these or those mentioned above which are found in the several capacities; for these would seem to be the most essential differences. In this connexion we may distinguish kinds which mature in three or in two months, and those, if there be such, which take a less number of days; for instance, they say that in the region of Aineia there is a kind which ripens and attains perfection within forty days from the time of sowing; they say too that this grain is strong and heavy, not light like that which takes three months; wherefore they give it even to the servants, for it also does not contain much bran. Now this kind is the rarest and the quickest to

[5] ἔνοντες conj. W.; ἔχοντες Ald.
[6] *cf.* 8. 2. 4. [7] Plin. 18. 69. [8] *i.e.* glumes.
[9] *cf. C.P.* 4. 12. 5; Plin. *l.c.* [10] Plin. 18. 70.

οὗτος. εἰσὶ δὲ καὶ δίμηνοί τινες οἵπερ καὶ ἐκ Σικελίας ἐκομίσθησαν εἰς Ἀχαίαν· ὀλιγοχόοι δὲ καὶ ὀλιγογόνοι καὶ κοῦφοι κατὰ τὴν προσφορὰν καὶ ἡδεῖς. καὶ ἄλλοι δέ τινες οἱ περὶ Εὔβοιαν εἰσὶ καὶ μάλιστα ἐν τῇ Καρυστίᾳ. τρίμηνοι δὲ πολλοὶ καὶ πανταχοῦ κοῦφοι οὗτοι καὶ ὀλιγοχόοι καὶ μονοκάλαμοι κατὰ τὴν ἔκφυσιν καὶ τὸ ὅλον
5 ἀσθενεῖς. κουφότατος μὲν οὖν ὡς ἁπλῶς εἰπεῖν πυρὸς ὁ Ποντικός· βαρύτερος δὲ τῶν εἰς τὴν Ἑλλάδα παραγινομένων ὁ Σικελός· τούτου δ' ἔτι βαρύτερος ὁ Βοιωτός· σημεῖον δὲ λέγουσιν ὅτι οἱ μὲν ἀθληταὶ ἐν τῇ Βοιωτίᾳ τρὶ[1] ἡμιχοίνικα μόλις ἀναλίσκουσιν, Ἀθήναζε δὲ ὅταν ἔλθωσι πένθ' ἡμιχοίνικα ῥᾳδίως. κοῦφος δὲ καὶ ὁ ἐν τῇ Λακωνικῇ. τούτων μὲν οὖν ἔν τε ταῖς χώραις καὶ τῷ ἀέρι τὸ αἴτιον· ἐπεὶ καὶ περὶ τὴν Ἀσίαν οὐ πόρρω Βάκτρων ἐν μέν τινι τόπῳ οὕτως ἁδρὸν εἶναί φασι τὸν σῖτον ὥστε πυρῆνος ἐλαίας μέγεθος λαμβάνειν, ἐν δὲ τοῖς Πισσάτοις καλουμένοις οὕτως ἰσχυρὸν ὥστ' εἴ τις πλεῖον προσενέγκοιτο διαρρήγνυσθαι, καὶ τῶν Μακεδόνων καὶ πολλοὺς τοῦτο παθεῖν. ἄτοπον δὲ καὶ ἀνομολογούμενον πρὸς τὴν τῶν τριμήνων κουφότητα τὸ περὶ τοὺς Ποντικοὺς συμβαῖνον· εἰσὶ γὰρ οἱ μὲν σκληροὶ ἠρινοὶ οἱ δὲ μαλακοὶ χειμερινοί· πολὺ γὰρ διαφέρει τῇ κουφότητι ὁ
6 μαλακός. [ὁμοίως δὲ καὶ δύο ἀρότους ὡς ἔοικε

[1] τρὶ' ἡμιχοίνικα conj. Sch.; τριημισχοίνικα M; τριημιχοίνικα P_2Ald.H.

mature. But there is also a kind which takes two months; this was brought to Achaia from Sicily; it is not however prolific nor fertile, though as food it is light and sweet. There is another such kind which grows in Euboea and especially in the region of Karystos. There are several kinds that take three months, and these, wherever they are found, are light and not prolific; their growth consists of a single 'reed,' and in general they are not robust. Lightest of all we may say is the Pontic wheat; the Sicilian is heavier than most of those imported into Hellas, but heavier still than this is the Boeotian; in proof of which it is said that the athletes in Boeotia consume scarcely three pints,[1] while, when they come to Athens, they easily manage five.[2] The Laconian kind is also light. The reason for these differences is to be found in the respective soils and in the climate; [3] for in Asia not far from Bactra they say that in a certain place the corn is so vigorous that the grains grow as large as an olive-stone, while in the country called that of the Pissatoi it is so strong that, if a man eats too much of it, he bursts, which was actually the fate of many of the Macedonians.[4] There is one curious thing about the corn of Pontus, which is an exception [5] to the rule as to the lightness of crops raised in three months; for there the hard crops are those of the spring, the soft ones those of the winter; for soft kinds are exceedingly light. Two sowings, as it appears, are made of all corn

[2] *πενθ' ἡμιχοίνικα* conj. Sch.; *πενθημισχοίνικα* M; *πενθημιχοίνικα* P_2Ald.H.
[3] Plin. 18. 70.
[4] *i.e.* in Alexander's army.
[5] *ἀνομολογούμενον*: *cf. C.P.* 4. 8. 2; Plat. *Gorg.* 495 A.

παντὸς τοῦ σίτου ποιοῦνται, τὸν μὲν χειμερινὸν τὸν δὲ ἠρινόν, ἐν ᾧ καὶ τὰ ὄσπρια καταβάλλουσιν].

Εἰσὶ δὲ καὶ οἱ μὲν καθαροὶ αἰρῶν, ὥσπερ ὁ Ποντικὸς καὶ ὁ Αἰγύπτιος· καθαρὸς δὲ ἐπιεικῶς καὶ ὁ Σικελὸς καὶ μάλιστα ὁ Ἀκραγαντῖνος οὐκ αἰρώδης.

Ὁ δὲ Σικελὸς ἴδιον ἔχει τὸ μελάμπυρον καλούμενον, ὅ ἐστιν ἀβλαβὲς καὶ οὐχ ὥσπερ ἡ αἶρα βαρὺ καὶ κεφαλαλγές. ἀλλὰ τὰ μὲν τοιαῦτα, καθάπερ ἐλέχθη, ταῖς χώραις ἀναθετέον καὶ ὅσον ἐπιβάλλει τοῖς γένεσιν.

V. Ἐν δὲ τοῖς ὀσπρίοις οὐχ ὁμοίως ἐστὶ λαβεῖν τὰς τοιαύτας διαφοράς, εἴτ' οὖν διὰ τὸ μὴ ἐξετάζειν ὁμοίως εἴτε καὶ διὰ τὸ μονοειδέστερα τυγχάνειν· ἔξω γὰρ ἐρεβίνθου καὶ φακοῦ καὶ ἐπ' ὀλίγου κυάμου καὶ ὀρόβου, καθ' ὅσον ἡ τῶν χρωμάτων καὶ τῶν χυλῶν διαφορά, τῶν γ' ἄλλων οὐ ποιοῦσιν ἰδέας. οἱ δὲ ἐρέβινθοι καὶ τοῖς μεγέθεσι καὶ τοῖς χυλοῖς καὶ τοῖς χρώμασι καὶ ταῖς μορφαῖς διαφέρουσιν, οἷον κριοὶ ὀροβιαῖοι οἱ ἀνὰ μέσον. ἐπὶ πᾶσι δὲ τὰ λευκὰ γλυκύτερα· καὶ γὰρ ὁ ὄροβος καὶ φακὸς καὶ ἐρέβινθος καὶ κύαμος καὶ σήσαμον· ἔστι γὰρ καὶ σήσαμον λευκόν.

2 Ἀλλὰ μᾶλλον ἐν τοῖς τοιοῖσδε ποιεῖν ἐστι τὰς διαφορὰς οἷον, ἐπεὶ πάντα ταῦτ' ἔλλοβα, τὰ μὲν

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[1] ὁμοίως . . . καταβάλλουσιν bracketed by Sch. as a gloss.
[2] But *cf.* 8. 8. 3. [3] *cf.* Diosc. 4. 116.
[4] *i.e.* when it gets into the bread.
[5] *cf.* Plin. 18. 156; Diosc. 2. 100.
[6] ὅσον ἐπιβάλλει : *cf.* Arist. *Pol.* 1. 13. 8.

alike, one in winter and one in spring, at which time they also plant the seed of the pulses.[1]

Some kinds are free from darnel, as the Pontic and the Egyptian; the Sicilian is also fairly free from it, and that of Akragas is especially immune from darnel.

[2] Peculiar however to the Sicilian is the plant called *melampyron*,[3] which is harmless[4] and not, like the darnel, injurious and productive of headache.[5] However such peculiarities, as was said, must be ascribed to the soil, and to a certain extent[6] to the different characters of different kinds.

Of the differences between pulses.

V. In pulses we cannot find such differences to the same extent, whether for the want of equally careful enquiry or because there is actually less diversity in these plants. [7] For, apart from chick-pea lentil and to a certain extent bean and vetch (in so far as in these we find differences of colour and taste), among the rest[8] no distinct forms are recognised. Chick-peas however differ in size colour taste and shape; thus there are the varieties called 'rams,' 'vetch-like' chick-peas and the intermediate forms.[9] In all pulses the white are the sweeter, and this applies to vetch lentil chick-pea bean and sesame, of which also there is a white form.

[10] However it is more possible to recognise the differences in such points as these:—all these plants have pods,[11] but whereas the pods in some kinds have

[1] Plin. 18. 124. [8] *γ'* conj. Sch.; *τ'* Ald.H.
[9] *οἱ* after *ὀριβιαῖοι* add. Dalec. For *ἀνὰ μέσον cf.* 3. 18. 2.
[10] Plin 18. 125.
[11] *ἕλλοβα* conj. Scal. from G; *ἐλλέβορα* Ald.H.; *ἐλλόβορα* U; *ἐπεὶ πάντα ταῦτ'* conj. W.; *ἐπὶ πάντα τὰ* Ald.H.

αὐτῶν ἀδιάφρακτα καὶ ὥσπερ συμψαύοντα τυγχάνει, καθάπερ ὄροβος πισὸς καὶ σχεδὸν τὰ πλεῖστα, τὰ δὲ διαπεφραγμένα, καθάπερ θέρμος, ἔτι δὲ μᾶλλον καὶ ἰδίως τὸ σήσαμον. καὶ τὰ μὲν μακρόλοβα τὰ δὲ καὶ στρογγυλόλοβα, καθάπερ ὁ ἐρέβινθος. ἀνὰ λόγον δ' ἀκολουθεῖ καὶ τὰ πλήθη τῶν σπερμάτων· ἐλάττω γὰρ ἐν τοῖς μικροῖς, ὥσπερ ἔν τε τῷ τῶν ἐρεβίνθων καὶ ἐν τῷ τῶν φακῶν.

3 Καὶ παραπλήσιαι δὲ ἴσως αἱ τοιαῦται καὶ ἃς ἐπὶ τῶν σιτηρῶν ἐλέγομεν περὶ τῶν σταχύων καὶ αὐτῶν τῶν καρπῶν· ἐπεὶ καὶ οἱ καλούμενοι λοβοὶ σχεδὸν ἀκόλουθοι τοῖς σπέρμασίν εἰσιν, οἱ μὲν ἐπιπλατεῖς, ὥσπερ οἱ τοῦ φακοῦ καὶ τῆς ἀφάκης, οἱ δὲ κυλινδρώδεις μᾶλλον, ὡς οἱ τοῦ ὀρόβου καὶ τοῦ πισοῦ· τὰ γὰρ σπέρματα ἑκατέρων τοιαῦτα τοῖς σχήμασι· ἀλλὰ τὰς μὲν τοιαύτας διαφορὰς πολλὰς ἄν τις εὕροι καθ' ἕκαστον, ὧν αἱ μὲν κοιναὶ πᾶσιν αἱ δὲ ἴδιαι κατὰ γένος.

4 Ὅτι δὲ πάντα προσπέφυκε τοῖς λοβοῖς καὶ ἔχει καθάπερ ἀρχήν τινα, τὰ μὲν προέχουσαν, ὥσπερ ὁ κύαμος καὶ ὁ ἐρέβινθος, τὰ δὲ καὶ ἔγκοιλον, ὥσπερ θέρμος καὶ ἄλλ' ἄττα, τὰ δὲ οὕτω μὲν οὐ φανερὰν ἐλάττω δὲ καὶ ὥσπερ ἀποσημαίνουσαν μόνον, δῆλον μὲν ἀπὸ τῆς ὄψεως· ἐξ ἧς καὶ ὅταν σπαρῇ βλαστάνει καὶ ῥιζοῦται, καθάπερ ἐλέχθη, κατ' ἀρχὰς δὲ καὶ αὐτὰ τρέφεται προσηρτημένα τῷ λοβῷ, μέχρι οὗ ἂν

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[1] ἀδιάφρακτα conj. Scal. from G, *non intersepta*; διάφρακτα Ald.H. [2] *cf.* 1. 11. 5.

[3] διαπεφραγμένα conj. Sch.; λεῖα πεφραγμένα Ald.H.

[4] *cf.* 3. 18. 13.

no divisions,[1] but the seeds as it were touch one another,[2] as in vetch pea and most kinds, in some there are divisions,[3] as in lupin and still more in sesame, in which the divisions are of a peculiar kind.[4] Again some have long, some round pods, as chick-pea. And the number of seeds follows in proportion, since they are fewer in the small pods, as in those of chick-pea and lentil.

Possibly these differences correspond to those which we mentioned in the case of cereals as to the ears and the actual fruits; for what are called 'pods' also[5] fairly correspond to the shape of the seeds, some being flat, as those of lentil and tare, some more or less cylindrical, as those of vetch and pea[6]: for in the case of either pair of plants the seeds correspond in shape. However one might discover and distinguish many such differences, of which some are common to a whole kind,[7] others special to particular varieties.

In all cases the seeds are attached to the pods and have a sort of starting-point, which in some cases projects, as in bean and chick-pea, in some is hollow, as in lupin and some others, and in some is not thus conspicuous but smaller and, as it were, only indicated; this is plain from observation; it is from this point that the seeds germinate and take root when they are sown, as was said[8]: but to start with they are themselves nourished by being so attached to the pod until they are matured. This

[5] *i.e.* as does the form of the ear in cereals.

[6] καὶ τοῦ πισοῦ· τὰ γὰρ conj. Scal. from Plin. *l.c.* and G; τοῦ πισοῦ γὰρ τὰ UMAld.

[7] *i.e.* which either differentiate (*e.g.*) pea from lentil, or one variety of pea from another. *cf.* 8. 4. 2 n.

[8] 8. 2. 1.

τελειωθῇ· φανερὸν δέ ἐστι καὶ ἐκ τῶν νῦν καὶ ἐκ τῶν προειρημένων. περὶ μὲν οὖν τῶν κατὰ τὰς διαφορὰς ἄλις.

VI. Σπείρειν δὲ ξυμφέρει πάντα μάλιστα μὲν ἐν τοῖς ὡραίοις ἀρότοις· οὐ μὴν ἀλλὰ καὶ ἐν ξηρᾷ τινες καταβάλλουσι καὶ οὐχ ἥκιστα πυροὺς καὶ κριθὰς ὡς μάλιστα αὐταρκεῖν[1] δυνάμενα, ὅπου μὴ ὄρνισιν ἢ ἄλλοις θηρίοις ἐπισινὴς[2] ἡ χώρα. δοκεῖ γὰρ ὡς ἐπὶ πᾶν ὁ πρῶτος ἄροτος ἀμείνων εἶναι, χείριστος δὲ σπόρος ἐν ταῖς ἡμιβρόχοις· ἀπόλλυται γὰρ καὶ ἐκγαλακτοῦται τὰ σπέρματα, καὶ ἅμα ξυμβαίνει πόαν ἀναφύεσθαι πολλήν. μετὰ δὲ τὴν σπορὰν ὕδωρ ἐπιγίνεσθαι πᾶσι ξυμφέρει, πλὴν ὅσα δυσβλαστῆ γίνεται μᾶλλον, ὥσπερ ὅ τε κύαμος δοκεῖ καὶ τῶν θερινῶν σήσαμον καὶ κύμινον καὶ ἐρύσιμον.

2 Πυκνοσπορεῖν δὲ καὶ μανοσπορεῖν καὶ πρὸς τὰς χώρας βλέποντα χρή· πλεῖον γὰρ ἡ πίειρα καὶ ἀγαθὴ δύναται φέρειν τῆς ὑφάμμου τε καὶ λεπτῆς. καίτοι λέγεταί τις λόγος ὡς ὁτὲ μὲν πλέον ὁτὲ δὲ ἔλαττον ἡ αὐτὴ δέχεται χώρα· καὶ οἰωνίζονται τὸ πλέον ὡς οὐκ ἀγαθόν, πεινῆν[3] γὰρ εὐθύς φασι τὴν γῆν· οὗτος μὲν οὖν ἴσως εὐηθέστερος λόγος. εἰ δέ τις πρὸς τὰ σπέρματα θεωροίη καὶ μάλιστά γε πρὸς αὐτοὺς τοὺς τόπους ἅμα τῷ ἐδάφει καὶ τὴν θέσιν ἀναθεωρῶν τήν γε πρὸς τὰ πνεύ-

[1] αὐταρκεῖν Ald.; ἀνταρκεῖν U.
[2] ἐπισινὴς conj. Dalec.; ἐπινὴς UMAld.; *obnoxia* G.
[3] *i.e.* after the rains.

is clear both from what is said now and from what was said before. Enough then about the points of difference.

Of sowing, manuring, and watering.

VI. It is expedient to sow all these, if possible, at the early seed-time; however some plant the seed even in dry ground, and especially wheat and barley, on the theory that they are most likely to hold their own[1] at a time when the ground is not infested[2] with birds or other creatures. For it appears that in general the first sowing is better, and worst that which is made in half-soaked ground;[3] for then the seeds perish and become 'milky';[4] moreover many weeds come up at that time. After the sowing however it is beneficial for all that rain should fall on them, except in the case of some which appear to germinate then with more difficulty, as seems[5] to be the case with beans, and among summer crops with sesame cummin and *erysimon*.

[6] As to sowing thickly or scantily one should have regard to the soil as well as to other considerations; for a fat good soil can bear more than one which is sandy and light. However there is a saying that the same soil can take at one time more, at another less seed; and in general the former condition is taken as an unfavourable omen, for then they say at once that the soil is hungry; however this is perhaps a rather foolish saying. If a man should have regard to the kind of the seed and especially to the actual situation, considering the aspect in respect of winds

[4] *cf.* γαλάκτωσις, *C.P.* 4. 4. 7 and 8.
[5] δοκεῖ conj. W.; ἐδόκει Ald. [6] Plin. 18. 196.

ματα καὶ τὸν ἥλιον, οἰκειότερον ἂν λαμβάνοι τὰς διαφοράς.

3 *Ἀνὰ λόγον δὲ ἔχει καὶ ἡ κόπρισις τοῖς σπόροις πρὸς τὰς χώρας· νειὸς δ' ἀμείνων ἡ χειμέριος τῆς ἐαρινῆς. ἐνιαχοῦ δὲ οὐ ξυμφέρειν βαθεῖαν ἀροτριᾶν, ὥσπερ καὶ ἐν Συρίᾳ, δι' ὃ μικροῖς ἀρότροις χρῶνται. παρ' ἄλλοις δὲ τὸ λίαν ἐξεργάζεσθαι βλάπτει, καθάπερ ἐν Σικελίᾳ, δι' ὃ καὶ τῶν ξένων ὡς ἔοικε πολλοὶ διαμαρτάνουσι. πάντα μὲν οὖν πρὸς τὰς χώρας.*

4 *Διαιροῦσι δὲ καὶ τὰ σπέρματα ποίᾳ ποῖον πρόσφορον· ἐν γὰρ ταῖς χειμεριναῖς πυρὸν μᾶλλον ἢ κριθήν, καὶ ὅλως σῖτον ἢ χεδροπὰ κελεύουσιν ἐν ταῖς χέρσοις καὶ διὰ χρόνου κινουμέναις· καὶ γὰρ αὗται πυρὸν φέρουσι μᾶλλον ἢ κριθήν. δέχεται δὲ καὶ ἐπομβρίαν μᾶλλον πυρὸς τῆς κριθῆς, καὶ ἐν τοῖς ἀκόπροις φέρει μᾶλλον. ὡσαύτως δὲ καὶ αὐτῶν τῶν πυρῶν ποῖος τῇ ποίᾳ πρόσφορος, οἷον ἀγαθῇ καὶ πιείρᾳ καὶ ψαφαρᾷ καὶ λεπτῇ <καὶ> ταῖς ἄλλαις ὁμοίως.*

5 *Ὕδωρ δὲ ὅταν μὲν χλοηφορήσῃ καὶ κυήσῃ πλεῖον ἅπασι ξυμφέρει· ἀνθοῦσι δὲ πυροῖς μὲν καὶ κριθαῖς καὶ τοῖς σιτώδεσι βλαβερόν· ἀπόλ-*

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[1] ἂν λαμβάνοι conj. Sch.; ἀναλαμβάνοι Ald.H.
[2] κόπρισις conj. Sch.; κόπρησις Ald.
[3] *cf. C.P.* 3. 20. 7. [4] *cf. C.P.* 3. 20. 5.
[5] πάντα μὲν οὖν M; ταῦτα μὲν Ald.H.; ταῦτα μὲν οὖν conj. Sch. followed by W.
[6] κελεύουσιν conj. W.; καὶ ὅλως Ald.H.
[7] κινουμέναις conj. Sch. (*cf. C.P.* 3. 21. 4, ἡ διὰ χρόνου γεωργουμένη γῆ); κενουμέναις UAld.; καινουμέναις Vin.

and sun, as well as the soil itself, he would more properly gauge[1] the differences.

Similarly manuring[2] for the sown crops should be done with regard to the soil; and it is better to turn up fallow[3] land in winter than in spring. And there are some[4] places in which deep ploughing is not expedient, as in Syria; wherefore they use small plough-shares. In other parts to work the ground too much is injurious, as in Sicily: wherefore many settlers in the country, it appears, make a mistake. From every point of view[5] therefore the soil must be considered.

The seeds are also classified according as each suits a particular soil; in wintry lands wheat is sown rather than barley, and in general they say[6] that corn rather than leguminous plants should be sown in barren soils which are only disturbed[7] at long intervals; and such soils bear wheat better than barley.[8] Moreover wheat welcomes abundant rain[9] more than barley, and bears better on land which is not manured.[10] In like manner they distinguish among wheats themselves which suits which kind of soil, namely which grows best in good[11] fat soil and which in crumbling light soil, and[12] so on with other kinds of soil.

[13] More abundant rain is beneficial to all crops when they have come into leaf and formed the flower; however it is harmful to wheats and barleys and other cereals when they are actually in flower; for

[8] *τῆς κριθῆς* conj. W.; *καὶ κριθῆς* UM; *ἡ κριθὴ* Ald.; *ἢ κριθὴ* H.
[9] *cf. C.P. l.c.*
[10] Explained *C.P. l.c.*
[11] *ἀγαθῇ* conj. Casaub: so Vin.; *ἀγαθὴ* Ald. (and so with the other datives). [12] *καὶ* add. St.
[13] Plin. 18. 151 and 152.

λυσι γάρ· ὀσπρίοις δ' ἀβλαβὲς πλὴν ἐρεβίνθων· οὗτοι γὰρ ἀποκλυσθείσης τῆς ἅλμης ἀπόλλυνται σφακελίζοντες καὶ ὑπὸ καμπῶν κατεσθιόμενοι· ἰσχυρότερος δὲ ὁ μέλας ἐρέβινθος καὶ ὁ πυρρὸς τοῦ λευκοῦ· συμφέρει δέ, φασίν, ἐν τοῖς ἐφύδροις τόποις ὀψὲ σπείρειν αὐτόν. κύαμος δὲ ἀνθῶν μάλιστα φιλεῖ βρέχεσθαι, δι' ὃ καὶ οὐκ ἐθέλουσιν ὀψισπορεῖν, ὥσπερ εἴπομεν, ὅτι πολὺν ἀνθεῖ· μετὰ δὲ τὴν ἀπάνθησιν ὀλίγου πάμπαν ὕδατος δεῖται· σύνεγγυς γὰρ ἡ τελείωσις. ἀλλ' ὅταν ἀδρυνθῇ καὶ βλάπτειν δοκεῖ τὰ σιτώδη καὶ κριθὴν δὲ πυροῦ μᾶλλον.

6 Ἐν Αἰγύπτῳ δὲ καὶ Βαβυλῶνι καὶ Βάκτροις, ὅπου μὴ ὕεται ἡ χώρα <ἢ> σπανίως, αἱ δρόσοι τὸ ὅλον ἐκτρέφουσιν. ἔτι καὶ οἱ περὶ Κυρήνην καὶ Εὐεσπερίδας τόποι. καιριώτατα δὲ πᾶσιν ὡς ἁπλῶς εἰπεῖν τὰ ἠρινά· δι' ὃ καὶ ἡ Σικελία πολύσιτος· πολλὰ γὰρ τοῦ ἦρος καὶ μαλακὰ γίνεται, τοῦ δὲ χειμῶνος ὀλίγα. ζητεῖ δὲ ἡ μὲν λεπτόγεως πολλὰ κατὰ μικρόν· ἡ δὲ πίειρα καὶ πλῆθος μὲν ἐνεγκεῖν δύναται καὶ ἀϋδρίαν—πρὸς δὲ τὴν χώρας ἀϋδρίαν πόντια πνεύματα καὶ αὖραι δοκοῦσι ξυμφέρειν, ἄλλα δὲ παρ' ἄλλοις τοιαῦτα, καθάπερ καὶ πρότερον εἴρηται,—ὡς ἐπὶ τὸ πᾶν δὲ μᾶλλον αὐχμὸς ἢ ἐπομβρία ξυμφέρει τῷ σίτῳ·
7 οἱ γὰρ ὄμβροι καὶ ἄλλως ἐναντίοι καὶ πολλάκις αὐτὰ τὰ σπέρματα διαφθείρουσιν, εἰ δὲ μὴ πλῆ-

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[1] *σφακελίζοντες*: *cf.* 4. 14. 4.

[2] *ὁ πυρρὸς τοῦ λευκοῦ* conj. Scal. from G and Plin. 18. 124; *ὁ λευκὸς τοῦ πυροῦ* UAld; *ὁ λ. τ. πυρροῦ* H.; *ὁ λ. τ. πυρὸς* M.

[3] *cf. C.P.* 3. 22. 3.

[4] *δεῖται* conj. Sch.; *δεῖσθαι* Ald.H.

it destroys the flower. But to pulses it is harmless, except to chick-peas; for these, if the salt is washed off them, perish from rot[1] or from being eaten by caterpillars. However the black and the red[2] chick-pea are stronger than the white, and it is beneficial, they say, to sow this crop late in moist soil. The bean[3] likes especially to receive rain when it is in flower; wherefore men are unwilling, as we said, to sow it late, because it flowers for a long time; but after it has shed its flowers, it needs[4] very little water, since its time of maturity is now near. But, when cereals have matured, it appears that water actually injures them, and barley more than wheat.

In Egypt Babylon and Bactra, where the country receives no rain, or[5] but little, the dews are sufficient nourishment; and so is it also[6] in the regions about Cyrene and the Euesperides. However to all, generally speaking, it is the spring rains which are the most seasonable; and that is why Sicily is rich in corn; for there is abundance of soft rain in spring and little of it in winter. A light soil requires plenty of rain, but little at a time; while that which is fat can indeed bear both an abundance of rain and a drought; (for a droughty country sea-winds[7] and breezes seem to be helpful, and various breezes of this kind prevail in various countries, as has been said already). Yet in general drought suits corn better than excessive rain; for heavy showers, apart from the harm which they do in other ways, often actually destroy the seed, or at

[5] ἢ add. Scal. from G: so Vin.
[6] ἔτι conj. St. from G (?); ἐπεὶ Ald.
[7] πόντια conj. Sch.; πάντα Ald. *cf.* 8. 7. 6.

θός γε ποιοῦσι βοτάνης, ὥστε καταπνίγεσθαι καὶ ἀτροφεῖν.

VII. Τῶν μὲν οὖν ἄλλων σπερμάτων οὐδὲν εἰς ἄλλο πέφυκε μεταβάλλειν φθειρόμενον, πυρὸν δὲ καὶ κριθὴν εἰς αἶραν φασι καὶ μᾶλλον τὸν πυρόν, γίνεσθαι δὲ τοῦτ' ἐν ταῖς ἐπομβρίαις καὶ μάλιστα ἐν τοῖς εὐύδροις καὶ ὀμβρώδεσι χωρίοις. ὅτι δ' οὐκ ἔστιν ἠρινὸν ἡ αἶρα καθάπερ ἡ ἄλλη πόα, πειρῶνται γάρ τινες τοῦτο λέγειν, ἐκεῖθεν δῆλον· εὐθὺς γὰρ τοῦ χειμῶνος φανερὰ γίνεται πεφυκυῖα· καὶ διαφέρει πολλοῖς· ἔχει γὰρ τὸ φύλλον στενὸν καὶ δασὺ καὶ λιπαρόν, καὶ τούτων ἰδιώτατον τὸ λιπαρόν· ἡ γὰρ δασύτης καὶ τοῖς τοῦ αἰγίλωπος ὑπάρχει, ἀλλ' ἐκφανὴς γίνεται ἐπὶ τοῖς τοῦ αἰγίλωπος τοῦ ἦρος. τοῦτο μὲν οὖν ἴδιον τούτων, καὶ ἔτι τοῦ λίνου· καὶ γὰρ ἐκ τούτου φασὶ γίνεσθαι τὴν αἶραν.

2 Τοῦ δὲ ἐρεβίνθου πρὸς τὰ ἄλλα χεδροπὰ τό τε περὶ τὴν ἄνθησιν λεχθὲν καὶ τὸ τάχιστα τελειοκαρπεῖν ἰσχυρότατον ὂν καὶ ξυλωδέστατον, καὶ

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[1] Plin. 18. 149 and 150; *cf. C.P.* 4. 5. 2.

[2] *πόα*: ? grasses; *cf.* 8. 6. 1.

[3] *πειρῶνται γάρ τινες* H.; *ἀπειρῶνται· αἰτιῶνται γάρ τινες* U; *ἃ πειρῶνται· αἰτιῶνται γάρ τινες* PM: so also Ald. Bas. Cam. with mark of corruption.

[4] *εὐθὺς γὰρ τοῦ* conj. Sch.; *εὐθὺς τὸ τοῦ* Ald.

least cause a luxuriant growth of leafage, so that the grain is choked and becomes abortive.

Of the degeneration of cereals into darnel.

VII. [1]Now, while it is not the nature of any other of these seeds to degenerate and change into something else, they say that wheat and barley change into darnel, and especially wheat; and that this occurs with heavy rains and especially in well-watered and rainy districts. But that darnel is not a plant of the spring, like other weeds[2] (for some endeavour[3] to make this out) is clear from the following consideration: it springs up and becomes noticeable directly[4] winter comes; and it is distinguished in many ways; the foliage[5] is narrow abundant and glossy, and this gloss is the most marked of these differences; (the[6] leaves of *aigilops*[7] are indeed also abundant, [8]but this character does not shew itself in them till spring). This then is peculiar to the seeds of wheat and barley, and also to those of flax; for that too, they say, turns into darnel.

Of the peculiar character of chick-pea.

A peculiarity of chick-pea as compared with other leguminous plants is that which has been mentioned as to its flowering; and also the fact that it is the quickest to mature its fruit, being very strong and woody; and again there is the fact that in

[5] *cf. C.P.* 4. 4. 11. [6] *τοῖs* conj. Sch.; *τῆs* Ald.

[7] Plin. 18. 155.

[8] ἀλλ' . . . *αἰγίλωπος*: text a makeshift. Wanting in Ald. and all MSS. except U; ἀλλ' *ἐκφανεῖs γίνονται καὶ τοῖs τοῦ αἰγ.* U; *ἐκφανὴs γίνεται* conj. Sch.; *ἐπὶ* for *καὶ* conj. W.

τὸ ὅλον μὴ ποιεῖν νειὸν <ὡς> καρπιζόμενον· τὴν δὲ πόαν ἐξαπόλλυσι καὶ μάλιστα δὲ καὶ τάχιστα τὸν τρίβολον. ὅλως δὲ οὐδὲ ἡ τυχοῦσα δύναται φέρειν αὐτόν, ἀλλὰ μελάγγειόν τινα δεῖ καὶ πίειραν εἶναι. τῶν δὲ ἄλλων ἡ ἀρίστη νειὸς ἀπὸ τῶν κυάμων καίπερ πυκνοσπορουμένων καὶ πολὺν καρπὸν φερόντων.

3 Τὰ δὲ ἐν τοῖς θερινοῖς ἀρότοις ὀλίγου δεῖ πάντα, φασὶ δὲ καὶ τὰ ναματιαῖα συμφέρειν μᾶλλον αὐτοῖς τῶν ἐκ διός, μέλινοι δὲ καὶ κέγχροι ἐλάττους ὕδατος· ἐὰν γὰρ ἔχωσι πλεῖον φυλλοβολοῦσιν. ἰσχυρότερον δὲ ὁ κέγχρος· οἱ δὲ μέλινοι γλυκύτεροι καὶ ἀσθενέστεροι. σήσαμον δὲ οὐδὲν <ζῷον> ἐσθίει χλωρὸν οὐδὲ θέρμον. εἰ δὲ μηδ' ἐρύσιμον μηδὲ ὅρμινον σκεπτέον· καὶ ταῦτα πικρά. ἔστι δὲ τὸ μὲν ἐρύσιμον ὅμοιον σησάμῳ καὶ λῖπος ἔχει· τὸ δὲ ὅρμινον κυμινῶδες μέλαν· σπείρεται δὲ ἅμα καὶ τὸ σήσαμον. περὶ μὲν οὖν τούτων σκεπτέον.

4 Ἐν δὲ ταῖς ἀγαθαῖς χώραις πρὸς τὸ μὴ φυλλομανεῖν ἐπινέμουσι καὶ ἐπικείρουσι τὸν σῖτον,

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[1] Lit. 'does not make fallow land.' *cf. C.P.* 4. 8. 3.

[2] *ὡς καρπιζόμενον* I conj. after W. (*καρπιζόμενον τὴν γῆν*); *καρπῶς* U; *καρπὸς* M; *καρπὸν* Ald. *cf. C.P. l.c.* and 4. 8. 1; 4. 8. 3: *μὴ καρπίζεσθαι τὴν γῆν ἀλλὰ νειὸν ποιεῖν* (? <*νέοις*>) *καρποῖς*, 'for fresh crops.'

[3] *δὲ* conj. W.; *γε* Ald. [4] *cf. C.P.* 4. 8. 3.

[5] *ἡ ἀρίστη νειὸς* conj. W. (*cf.* 8. 9. 1; *C P.* 4. 8. 1); *χειρίστη νήπιος* U; *χειρίστην νήπιος* MP; *καλλίστη νειὸς* Ald. *cf.* also *C.P.* 3. 20. 7.

general it does not reinvigorate the ground,[1] since it exhausts[2] it; but it destroys weeds,[3] and above all and soonest caltrop. And in general[4] it is not every kind of soil which suits it; the soil should be black and fat. Of the other leguminous plants the bean best[5] reinvigorates the ground, even if it is sown thick and produces much fruit.

Of special features of 'summer crops.'

All those crops[6] sown at the summer seed-time need little water,[7] and they say also that spring water is better for them than rain water; and Italian millet[8] and millet need less water, for, if they have too much, they shed their leaves. Millet is the robuster plant, Italian millet is sweeter and less robust. Sesame and lupin are not eaten green by any animal[9]; whether the same is true of *erysimon* and *horminon* is matter for enquiry; for these too are bitter. *Erysimon* is like sesame and is oily; *horminon* is like cummin and black, and is sown at the same time as sesame. These matters then require investigation.

Of treatment of cereals peculiar to special localities.

[10] In good soils to prevent the crop running wildly to leaf they graze and cut down the young corn,

[6] Plin. 18. 96 and 101.

[7] ὀλίγου, sc. ὕδατος, but the omission is strange; perhaps due to misunderstanding of ὀλίγου δεῖ by a scribe. Sch. joins the words τὰ δὲ . . . πάντα to the last sentence, and supplies καρπίζεται τὴν γῆν (ὀλίγου δεῖ = almost).

[8] μέλινοι Ald. H.; ἔλυμοι Vin. *cf.* 8. 1. 1. n.

[9] ζῷον add. Sch. from G and Plin. 18. 96. *cf. C.P.* 6. 12. 12.

[10] Plin. 18. 157–162.

ὥσπερ καὶ ἐν Θετταλίᾳ. συμβαίνει δ' ἂν μὲν ἐπινέμωσιν ὁποσακισοῦν μηδὲν ἀλλοιοῦσθαι τὸν καρπόν, ἂν δὲ ἐπικείρωσιν ἅπαξ μόνον ἐξίστασθαι τὸν πυρὸν καὶ γίνεσθαι μακρὸν καὶ οὐχ ἁδρόν, ὃν καλοῦσι καμακίαν, καὶ οὐκ ἀποκαθίστασθαι πάλιν σπειρόμενον· τοῦτο μὲν οὖν ὡς παύροις συμβαῖνον Θετταλοὶ λέγουσιν. ἐν Βαβυλῶνι δὲ ἀεὶ καὶ ὥσπερ τεταγμένως ἐπικείρουσι μὲν δίς, τὸ δὲ τρίτον τὰ πρόβατα ἐπαφιᾶσιν· οὕτω γὰρ φύει τὸν καυλόν, εἰ δὲ μὴ φυλλομανεῖ· γίνεται δὲ μὴ καλῶς ἐργασαμένοις πεντηκονταχόα, τοῖς δὲ ἐπιμελῶς ἑκατονταχόα. ἡ δὲ ἐργασία τὸ ὡς πλεῖστον χρόνον ἐμμένειν τὸ ὕδωρ, ὅπως ἰλὺν[1] ποιήσῃ πολλήν· πίειραν γὰρ οὖσαν καὶ πυκνὴν τὴν γῆν δεῖ ποιῆσαι μανήν. ὕλην[1] δὲ οὐ φέρει καὶ πόαν ὥσπερ ἐν Αἰγύπτῳ. τὰ μὲν οὖν τοιαῦτα χώρας ἀρετῆς.

Φύεται δὲ καὶ ἀπὸ ῥιζῶν πυρὸς καὶ κριθὴ πολλαχοῦ τῷ ὑστέρῳ ἔτει· αὐτοετὴς δὲ καὶ ἀπὸ τῶν εἰς κράστιν κειρομένων ἑτέρου καλάμου παραβλαστάνοντος. ὡσαύτως δὲ κἂν ὑπὸ χειμῶνος ἐκπαγῇ· παραβλαστάνει γὰρ ὑδάτων ἐπιγινομένων· ὁ δὲ στάχυς ἀτελὴς καὶ μικρὸς ἀπὸ τῶν τοιούτων. βλαστάνουσι δὲ τῷ ὑστέρῳ ἔτει καὶ ἀπὸ τῶν καταπονουμένων καὶ συμπατουμένων, ὥστε μηδὲν εἶναι δῆλον ὡς εἰπεῖν, οἷον ὅταν

[1] ἰλὺν conj. Sch. from Plin. 18. 162; ὕλην Ald.H.
[2] Text perhaps defective: *cf.* Plin. *l.c.*

for instance in Thessaly. And the result is that, however often they graze it, the crop is not impaired; while if they cut it down not more than once, the wheat changes in character and becomes tall and weak—what they call 'long-shafted' corn, and, if seed of this is sown, it does not recover its character. This the Thessalians tell of as having occurred in a few cases. At Babylon however they cut it down twice always and as it were systematically, and after that they let the sheep on to it; for in that case it makes its straw, but otherwise it runs wildly to leaf; and, if the ground is ill cultivated, it produces fifty fold, if it is carefully cultivated, a hundred fold. And the 'cultivation' consists in letting the water lie on it as long as possible, so that it may make much silt[1]; for the soil being fat and close must be made open. And at Babylon[2] the ground does not produce weeds and grasses, as it does in Egypt. Such are the things which depend on the quality of the soil.

Of cereals which grow a second time from the same stock.

[3] Wheat and barley also in many places grow from the root in the next year, or in the same year from crops cut down for fodder, since a second haulm shoots up. The like happens also if the plant has been nipped by winter; for it shoots again when rain comes; but such plants produce an ear which is imperfect and under-sized. There is also new growth the next year from plants which are roughly treated or trodden down[4] so that hardly anything remains visible, as happens when an army has marched over

[3] *cf. C.P.* 4. 8. 5. [4] *cf. C.P. l.c.*

διέλθῃ στρατόπεδον, καὶ οἱ στάχυες μικροὶ καὶ τούτων, οὓς καλοῦσιν ἄρνας· τῶν δὲ χεδροπῶν οὐδὲν δύναται τοιοῦτον ποιεῖν ἢ οὐχ ὁμοίως. καὶ αἱ βλαστήσεις τοσαυταχῶς.

6 Πρὸς αὔξησιν δὲ καὶ τροφὴν μέγιστα μὲν ἡ τοῦ ἀέρος κρᾶσις συμβάλλεται, καὶ ὅλως ἡ τοῦ ἔτους κατάστασις· εὐκαίρων γὰρ ὑδάτων καὶ εὐδιῶν καὶ χειμώνων γινομένων ἅπαντα εὔφορα καὶ πολύκαρπα, κἂν ἐν ἁλμώδεσι καὶ λεπτογείοις ᾖ· διὸ καὶ παροιμιαζόμενοι λέγουσιν οὐ κακῶς ὅτι "ἔτος φέρει οὐχὶ ἄρουρα."

Μέγα δὲ καὶ αἱ χῶραι διαφέρουσιν οὐ μόνον τῷ πίειραι καὶ λεπταὶ καὶ ἔπομβροι καὶ αὐχμώδεις <εἶναι> ἀλλὰ καὶ τῷ ἀέρι τῷ περιέχοντι καὶ τοῖς πνεύμασιν· ἔνιαι γὰρ οὖσαι λεπταὶ καὶ φαῦλαι τελεσφοροῦσι διὰ τὸ πρὸς τὰ πνεύματα τὰ πόντια
7 κεῖσθαι καλῶς. ἄλλα δὲ ἄλλαις τοιαῦτα, καθάπερ πολλάκις εἴρηται· ταῖς μὲν γὰρ τὰ ζεφυρικὰ ταῖς δὲ τὰ βόρεια ταῖς δὲ τὰ νότια.

Συμβάλλεται δὲ καὶ οὐ μικρὰ ἡ ἐργασία καὶ μάλισθ' ἡ <πρὸ> τοῦ σπόρου· κατεργασθεῖσα γὰρ ῥᾳδίως ἐκφέρει. καὶ ἡ κόπρος δὲ μεγάλα βοηθεῖ τῷ διαθερμαίνειν καὶ συμπέττειν· προτρέχει γὰρ τὰ κοπριζόμενα τῶν ἀκόπρων καὶ εἴκοσιν ἡμέραις·

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[1] *τούτων* conj. Sch.; *τούτους* Ald. H.
[2] *cf.* Lewis and Short *s.v. agna.*
[3] *C. P. l.c.* gives the reason.
[4] *τοσαυταχῶς* conj. Scal.; *τοσαυταχεῖς* Ald. H.

the field; the ears in such cases[1] too are undersized and are called 'lambs.'[2] But no kind of leguminous plant[3] can do anything of the kind, or at least not to the same extent. In these various ways[4] may new growth occur.

Of the effects of climate, soil, and manuring.

For growth and nourishment the climate is the most important factor, and in general the character of the season as a whole; for when rain, fair weather and storms occur opportunely, all crops bear well and are fruitful, even if they be in soil which is impregnated with salt or poor. Wherefore there is an apt proverbial saying[5] that "it is the year which bears and not the field."

But the soil also makes much difference, according as it is[6] fat or light, well watered or parched, and it also makes quite as much difference what sort of air and of winds prevails in that region; for some soils,[7] though light and poor, produce a good crop because the land has a fair aspect in regard to sea breezes. But, as has been repeatedly said already, the same breeze has not this effect in all places; some places are suited by a west, some by a north, some by a south wind.

Again the working of the soil and above all that which is done before[8] the sowing has an important effect; for when the soil is well worked it bears easily. Also dung is helpful by warming and ripening the soil, for manured land gets the start by as much as twenty days of that which has not been

[5] Quoted also *C.P.* 3. 23. 4.
[6] εἶναι add. Sch. [7] *cf. C.P.* 3. 23. 5.
[8] πρὸ add. W. *cf. C.P.* 3. 20. 6.

ἅπασι δὲ οὐ ξυμφέρει· καὶ χρήσιμος οὐ μόνον τοῖς περὶ τὸν σῖτον ἀλλὰ καὶ τοῖς ἄλλοις πλὴν πτερίδος, ταύτην δὲ φθείρειν φασὶν ἐπιβαλλομένην. ἀπόλλυται δὲ ἡ πτερὶς καὶ ἐπικοιμωμένων τῶν προβάτων, ὡς δέ τινες λέγουσι καὶ ἡ Μηδικὴ διὰ τὴν κόπρον καὶ τὸ οὖρον.

VIII. Τῶν δὲ σπερμάτων ἕκαστα καὶ πρὸς τὴν τῆς χώρας φύσιν ἁρμόττει, καὶ ὅλως γένη πρὸς γένος καὶ ἐν αὐτοῖς τοῖς ὁμογενέσιν, ἃ δὴ πειρῶνται διαιρεῖν. μεταβάλλει δὲ τὰ ξενικὰ τῶν σπερμάτων μάλιστα μὲν ἐν τρισὶν ἔτεσιν εἰς τὰ ἐπιχώρια. συμφέρει δὲ ἐκ τῶν ἀλεεινῶν εἰς τὰ μικρὸν ἧττον ἀλεεινὰ καὶ ἐκ τῶν ψυχεινῶν ἀνὰ λόγον ποιεῖσθαι τὴν μεταβολήν. τὰ δ' ἐκ τῶν δυσχειμερινῶν ἐν τοῖς πρωΐοις ὀψὲ ἀποχεῖται, ὥστ' ἀπ' αὐχμοῦ φθείρεται, ἐὰν μὴ ὄψιον ὕδωρ σώσῃ. διὰ τοῦτο καὶ εὐλαβητέον φασὶ τὸ μίσγειν τὰ ξενικὰ τοῖς ἐπιχωρίοις ἐὰν μὴ ἐξ ὁμοίας, ὅτι ἀσύμφωνα τῇ χώρᾳ κατὰ τὸν σπόρον καὶ κατὰ τὴν γένεσιν, ὥστε καὶ ἐργασίας ἑτέρας δεῖται· τάς τε τῆς γῆς διαφορὰς καὶ τὰς τῶν σπερμάτων δυνάμεις καὶ ἔτι τὰς ἑκάστων ὥρας.

2 Ὅταν δὲ εὐετηρία γένηται, καὶ πολυνοστότερα τὰ σπέρματα γίνεται. Ἀθήνῃσι γοῦν αἱ κριθαὶ

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[1] *cf.* Col. 2. 2. 13. The reference is perhaps to fern grown for litter, or possibly for medicinal use. *cf.* 9. 20. 5.

[2] χώρας conj. Sch.; ὥρας Ald. [3] ἃ conj. Dalec.; ἂν Ald.

[4] ψυχεινῶν conj. W.; ψυχικῶν UM; ψυχρῶν Ald.

[5] ἀποχεῖται conj. Sch., *cf.* ἀπόχυσις 8. 3. 4; ἀποκεῖται Ald. *cf.* 4. 4. 10.

manured. However manure is not good for all crops; and further it is beneficial not only to corn and the like but to most other things, except fern,[1] which they say it destroys if it is put on. (Fern is also destroyed if sheep lie on it, and, as some say, lucerne is destroyed by their dung and urine.)

Of different qualities of seed.

VIII. There is a particular kind of soil[2] which best suits each kind of seed, whether we compare one class with another or those of the same class; and attempts are made to distinguish these.[3] Foreign seeds change into the native sorts in about three years. It is well that they should be imported from a warm climate to one that is rather less warm, or from a cold one[4] to one that is rather less cold. Those imported from a wintry climate, if they be those of early crops, are late in coming into ear,[5] so that they get destroyed by drought unless rain late in the season saves them. Wherefore they say that one should take good heed not to mix foreign with native seeds, unless they come from a similar place, since[6] they do not agree with the soil[7] as to the time of being sown and of germinating, and accordingly need different cultivation; and so that one should take good heed to the differences of soil, the properties of the seed, and further the seasons appropriate to each.

When however there is a good season, the grain also is fuller.[8] For instance at Athens the barley pro-

[6] ὅτι conj. Sch.; ἔτι UMAld.

[7] χώρᾳ conj. Sch.; ὥρᾳ UMAld.

[8] πολυνοστότερα: *cf.* νόστιμος, *C.P.* 4. 13. 2, *Geop.* 2. 16. 1, and other reff. in Sch.'s exhaustive note.

τὰ πλεῖστα ποιοῦσιν ἄλφιτα· κριθοφόρος γὰρ ἀρίστη· τοῦτο δ' οὐχ ὅταν πλεῖσται γένωνται ἀλλ' ὅταν λάβῃ τινὰ κρᾶσιν. ἐν δὲ τῇ Φωκίδι περὶ Ἐλάτειαν οἱ πυροὶ ποιοῦσιν ἡμιόλια τὰ ἄλευρα, καὶ ἐν Σόλοις τῆς Κιλικίας καὶ οἱ πυροὶ καὶ αἱ κριθαί· καὶ παρ' ἄλλοις ἄλλα πρὸς ἅπερ εὐφυὴς ἑκάστη. βελτίω μὲν οὖν καὶ χείρω τὰ σπέρματα καὶ διὰ τὴν ἐργασίαν καὶ διὰ τὴν γῆν γίνεται· καὶ γὰρ ἀπαγριοῦται καὶ ἡμεροῦται, καθάπερ τὰ δένδρα· καὶ ὅλως μεταβάλλει <κατὰ>[1] τὴν χώραν, ὥσπερ τινὰ[2] τῶν δένδρων εὐθὺς ἔστηκε πρὸς τὸ χεῖρον.

3 Γένος δ' ὅλον ἐξαλλάττειν εἰς ἕτερον οὐδὲν ἄλλο πέφυκε πλὴν τίφη καὶ ζειά[3], καθάπερ εἴπομεν ἐν τοῖς πρώτοις λόγοις, καὶ ἡ αἶρα δ' ἐκ τῶν πυρῶν καὶ κριθῶν διαφθειρομένων· ἢ εἰ μὴ τοῦτο ἀλλὰ φιλεῖ γε μάλιστα ἐν τοῖς πυροῖς γίνεσθαι, καθάπερ καὶ ὁ μελάμπυρος ὁ Ποντικὸς καὶ τὸ τῶν βολβῶν σπέρμα, καὶ ἄλλα δὲ ἐν ἄλλοις τῶν σπερμάτων· ἐπεὶ καὶ ὁ αἰγίλωψ δοκεῖ μᾶλλον ἐν ταῖς κριθαῖς, ἐν δὲ τοῖς φακοῖς ἄρακος τὸ τραχὺ καὶ σκληρόν, ἐν δὲ ταῖς ἀφάκαις ὁ πελεκῖνος ὅμοιον τῇ ὄψει τῷ πελέκει· σχεδὸν δὲ καθ' ἕκαστόν ἐστι τὸ συνεκτρεφόμενον καὶ συναναγκάζον ἐξαλλάττειν καὶ μεταβάλλειν.

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[1] κατὰ add. W. *cf.* 2. 4. 1.
[2] τινα conj. W.; τε P; τῷ Ald.; τὸ H.Vin.Vo. *cf.* 2. 2. 6.
[3] ζειά conj. Scal.; ἕα Ald.H. [4] 2. 4. 1.

duces more meal than anywhere else, since it is an excellent land for that crop; and this is so, not merely when a very large crop is sown, but when the weather has been favourable for it. And in Phocis about Elateia the wheats produce half as much meal again as elsewhere; while at Soli in Cilicia this is true of both wheat and barley; and in other parts there are other crops for which the soil is severally well adapted. Wherefore grain turns out better or worse because of the soil as well as because of cultivation; for in some places it changes into the cultivated from the wild form, or the reverse, like trees; and in general it changes according[1] to the soil in which it is grown, just as some[2] trees, when transplanted, forthwith deteriorate.

Of degeneration of cereals, and of the weeds which infest particular crops.

But no kind can change altogether into another, except one-seeded wheat and rice-wheat,[3] as we said[4] in our previous discussions, and darnel which comes from degenerate wheat and barley: at least, if this is not the true account, darnel loves chiefly to appear among wheat, as does the Pontic[5] *melampyros* and the seed of purse-tassels,[6] even as other seeds appear in other crops; thus *aigilops* seems to grow for choice among barley, and among lentils the rough hard kind of *arakos*, while among tares occurs the axe-weed,[7] which resembles an axe-head in appearance. Indeed in the case of nearly every crop there is a plant which grows up with it and

[5] *cf.* 8. 4. 6, where μελάμπυρον was said to be peculiar to Sicily. [6] *cf. C.P.* 4. 6. 1.

[7] Plin. 18. 155; 27. 121; Diosc. 3. 130; Hesych. *s.v.* βέλλεκυς.

μιγνύμενον εἴτε διὰ τὰς χώρας, ὅπερ οὐκ ἄλογον,
4 εἴτε δι' ἄλλην τινὰ αἰτίαν. ἔνια δὲ καὶ φανερῶς
ἐστι κοινὰ πλειόνων, ἀλλὰ διὰ τὸ μάλιστα ἓν
τισιν εὐθενεῖν ἴδια τούτων φαίνεται, καθάπερ ἡ
ὀροβάγχη τῶν ὀρόβων καὶ ἡ ἀπαρίνη τῶν φακῶν·
ἀλλὰ ἡ μὲν μάλιστα ἐπικρατεῖ τῶν ὀρόβων διὰ
τὴν ἀσθένειαν· ἡ δὲ ἀπαρίνη μάλιστα ἐν τοῖς
φακοῖς εὐτροφεῖ· τρόπον δέ τινα καὶ παραπλή-
σιόν ἐστι τῇ ὀροβάγχῃ <τῷ> ἐπιβάλλειν καὶ
κατέχειν ὅλον ὥσπερ πλεκτάναις· ἀποπνίγει γὰρ
οὕτως, ὅθεν καὶ τοὔνομα εἴληφε.

5 Τὸ δ' ὑποφυόμενον εὐθὺς ἐκ τῆς ῥίζης τῷ
κυμίνῳ καὶ τῷ βουκέρῳ τὸ αἱμόδωρον καλούμενον
μᾶλλον ἰδίᾳ. ἔστι δὲ τὸ αἱμόδωρον μονόκαυλον
οὐκ ἀπεμφερές [τῷ καυλῷ], πλὴν βραχύτερόν τε
πολύ, καὶ ἄνωθέν τι κεφαλῶδες ἔχει ῥίζαν δὲ
ὑποστρόγγυλον· οὐθὲν δὲ ἕτερον ἀφαυαίνεται
παρὰ τὸ βούκερας. γίνεται δὲ ταῦτα ἐν ταῖς
λεπταῖς οὐκ ἐν ταῖς πιείραις, ὥσπερ καὶ τῆς
Εὐβοίας ἐν τῷ Ληλάντῳ μὲν οὐ γίνεται περὶ δὲ
τὸν Κάνηθον καὶ εἴ τις ἄλλος τοιοῦτος τόπος.

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[1] ἄλλην τινα conj. Sch.; ἄλλης τινα U; ἄλλην Ald.
[2] τῷ add. Sch.
[3] πλεκτάναις conj. W.; πλεκτᾶνες U; πλεκτάνης M; πλεκτάνην Ald.; *veluti brachiis* G.
[4] Plin. 19. 176, who however calls this αἱμόδωρον. See Index App. (26).

mingles with it, whether this is due to the soil, which is a reasonable explanation, or to some other[1] cause. Some plants of this character evidently attach themselves to more than one kind of crop, but, because they are specially vigorous in some one particular crop, they are thought to be peculiar to that one, as 'vetch-strangler' (dodder) to vetches and bedstraw to lentils. But the former gains the mastery over the vetches especially because of the weakness of that plant; and bedstraw is specially luxuriant among lentils; to some extent it resembles dodder, in that[2] it overspreads the whole plant and holds it fast as it were in coils,[3] for it is thus that dodder strangles the plant, and this is the origin of its name ('vetch-strangler').

[4]The plant which springs up straight from the roots of cummin and the plant called broom-rape which similarly attaches itself to 'ox-horn'[5] (fenugreek) are somewhat more peculiar in their habits.[6] Broom-rape has a single stem,[7] and is not unlike . . . ,[8] but is much shorter and has on the top a sort of head, while its root is more or less round; and there is no other plant which it starves except fenugreek. These plants grow in light and not in fat soils; thus in Euboea they do not occur at Lelanton,[9] but only about Kanethos[10] and in districts of like character.

[5] Plin. 24. 184.

[6] ἰδίᾳ MSS.; ? ἴδια.

[7] *cf. C.P.* 5. 15. 5, where the same is said of λειμόδωρον (*cf.* Plin. 19. 176). But Ald.Bas.Cam. give αἱμόδωρον here; *hemodorum* G.

[8] τῷ καυλῷ probably conceals the name of a plant.

[9] *cf.* Strabo, 10. 1. 9. L. is the name of a Euboean *river* in Plin. 4. 64.

[10] *cf.* Strabo, 10. 1. 8, Ap. Rhod. 1. 77.

ταῦτα μὲν οὖν κοινὰ πλειόνων ὄντα κατισχύει μᾶλλον ἐν τοῖς εἰρημένοις διὰ τὴν ἀσθένειαν.

6 Τὸ δὲ τέραμον καὶ ἀτέραμον λέγεται μὲν ἐπὶ τῶν ὀσπρίων μόνον, οὐκ ἄλογον δὲ καὶ ἐπὶ τῶν σιτωδῶν παραπλήσιον ἢ καὶ ταὐτό τι συμβαίνειν, ἀλλὰ διὰ τὸ μὴ τὴν αὐτὴν εἶναι χρείαν οὐχ ὁμοίως ἐμφανές· ἐπεὶ οὐδ' ἐπὶ τούτων ἁπάντων ὁμοίως ἀλλὰ μάλιστα ἐπὶ τῶν κυάμων λέγεται καὶ φακῶν, εἴτ' οὖν καὶ μάλιστα πασχόντων εἴτε καὶ διὰ τὴν χρείαν φαινομένων. γίνεται γοῦν πλεοναχῶς· πολλαχοῦ γὰρ τόποι τινές εἰσιν οἳ αἰεὶ φέρουσι τεράμονα καὶ ἄλλοι πάλιν ἀτεράμονα· τὸ δὲ ὡς ἐπὶ πᾶν οἱ λεπτόγεω μᾶλλον
7 τεράμονα· καὶ ἀέρος κατάστασίς τις ποιεῖ τὴν τοιαύτην παραλλαγήν· σημεῖον δὲ ὅτι ταὐτὰ χωρία καὶ ὁμοίως ἐργασθέντα φέρει ποτὲ μὲν τεράμονα <ποτὲ δὲ ἀτεράμονα.> περὶ Φιλίππους δὲ ὁ κύαμος λικμώμενος, ἐὰν ὑπὸ πνεύματος ἐγχωρίου ληφθῇ, τεράμων ὢν ἀτεράμων γίνεται. ταῦτα μὲν οὖν μηνύει διότι πολλαχῶς τῶν αὐτῶν

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[1] *cf.* 2. 4. 2; *C.P.* 4. 12; Plin. 18. 155, who makes *ateramum*, *teramum* plants.

[2] πλεοναχῶς· πολλαχοῦ I conj.; πλέον· πολλαχῶς MSS.

[3] ποτὲ δὲ ἀτεράμονα add. H. from G.

[4] *cf. C.P.* 4. 12. 8; Plut. *Quaest. Conv.* 7. 2. 3; Plin. *l.c.*

The reason then why these plants, which attach themselves to more than one kind, grow stronger when attached to the plants specified, is that the latter are not robust.

Of the conditions in the seeds of pulses known as 'cookable' and 'uncookable,' and their causes.

[1]The terms 'cookable' and 'uncookable' are only applied to pulses, but it is not unreasonable to suppose that conditions like those indicated, if not identical with them, occur also in cereals, though they are not so obvious, since these plants are not put to the same use. Indeed it is said that these terms are not applied even to all pulses alike, but chiefly to beans and lentils, either because these are specially subject to these conditions, or because the use to which they are put makes them more conspicuous. At all events the conditions occur for a variety of reasons; for in many parts [2] there are places which regularly produce seeds that are 'cookable,' while others again produce seeds that are 'uncookable'; in general however it is light soils which tend to produce the former. Now it is a certain condition of the climate which causes this variation; a proof of which is the fact that the same piece of land, tilled in the same manner, produces sometimes seeds that are 'cookable,' sometimes seeds that are 'uncookable.' [3] In the district of Philippi, if the beans, while being winnowed,[4] are caught by the prevailing wind of the country, they become 'uncookable,' having previously been 'cookable.' These facts prove that for various reasons, of districts [5] which are close together, have the same

[5] *αὐτῶν* conj. W.; *δὲ τῶν* Ald. *cf.* a similar expression 8. 2. 10.

χωρίων ἔνια σύνορα καὶ ὁμοίως καθήμενα καὶ οὐδεμίαν ἔχοντα κατὰ τὴν γῆν διαφορὰν τὸ μὲν τεράμονα τὸ δ' ἀτεράμονα φέρει, καὶ ἐνίοτε μόνον αὔλακος διοριζούσης.

IX. Καρπίζεται τὴν γῆν μάλιστα πυρὸς εἶτα κριθή, δι' ὃ καὶ ὁ μὲν ἀγαθὴν ζητεῖ χώραν ἡ δὲ κριθὴ δύναται καὶ ἐν ταῖς ψαφαρωτέραις ἐκφέρειν· τῶν δὲ χεδροπῶν μάλιστα ἐρέβινθος καίπερ ἐλάχιστον χρόνον ἐν τῇ γῇ μένων, ὁ δὲ κύαμος, ὥσπερ ἐλέχθη, καὶ ἄλλως οὐ βαρὺ καὶ ἔτι κοπρίζειν δοκεῖ τὴν γῆν διὰ μανότητα καὶ εὐσηψίαν· δι' ὃ καὶ οἱ περὶ Μακεδονίαν καὶ Θετταλίαν ὅταν ἀνθῶσιν ἀνατρέπουσι τὰς ἀρούρας.

2 Τῶν δὲ ὁμοιοπύρων καὶ ὁμοιοκρίθων, οἷον ζειᾶς τίφης ὀλύρας βρόμου αἰγίλωπος, ἰσχυρότατον καὶ μάλιστα καρπιζόμενον ἡ ζειά· καὶ γὰρ πολύρριζον καὶ βαθύρριζον καὶ πολυκάλαμον· ὁ δὲ καρπὸς κουφότατος καὶ προσφιλὴς πᾶσι τοῖς ζώοις. τῶν δὲ ἄλλων ὁ βρόμος· πολύρριζος γὰρ καὶ οὗτος καὶ πολυκάλαμος. ἡ δὲ ὀλύρα μαλακώτερον καὶ ἀσθενέστερον τούτων. ἡ δὲ τίφη πάντων κουφότατον· καὶ γὰρ καὶ μονοκάλαμον <καὶ λεπτοκάλαμον,> δι' ὃ καὶ χώραν ζητεῖ

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[1] *cf. C.P.* 4. 12. 1. [2] *cf. C.P.* 4. 8. 3.
[3] Plin. 18. 120; Varro 1. 23. 3; Col. 2. 10. 7.
[4] 8. 7. 2.
[5] *i.e.* dig in the bean-plants if the soil is poor, before the pods are formed enough to make it worth while to gather the beans. So Varro *l.c.* [6] Cited by Galen,

aspect and shew no difference of soil, some bear 'cookable' some 'uncookable' seeds, and that sometimes when there is only [1] the breadth of a furrow between them.

Of the grains and pulses which most exhaust the soil, or which improve it.

IX. Wheat exhausts the land more than any other crop, and next to it barley; wherefore the former requires good soil, while barley will bear even on somewhat crumbling soils; [2] and of leguminous plants chick-pea is the most exhausting, although this crop is in the ground only a very short time. [3] Beans, as was said,[4] are in other ways not a burdensome crop to the ground, they even seem to manure it, because the plant is of loose growth and rots easily; wherefore the people of Macedonia and Thessaly turn over the ground when it is in flower.[5]

[6] Of the plants which resemble wheat or barley —such as *zeia* (rice-wheat) one-seeded wheat *olyra* [7] (rice-wheat) oats *aigilops*—*zeia* is the strongest [8] and most exhausts the ground; for it has many roots which run deep and many stems; but its fruit is the lightest and is welcome to all animals. Of the rest oats [9] is the most exhausting; for this too has many roots and many stems. *Olyra* is a more delicate plant and not so robust as these. But one-seeded wheat is the crop which is of all the least burdensome to the soil; for it has but a single slender stem [10]; wherefore also it requires a light soil and not, like

[7] See Index.
[8] *ἰσχυρότατον* conj. W. from Galen; *ἰσχυρότερον* Ald.
[9] *βρόμος· πολύρριζος γὰρ* conj. Sch.; *β. πολ.· καὶ γὰρ* Ald.
[10] *καὶ λεπτοκάλαμον* add. Bod. from Galen.

λεπτήν, οὐχ ὥσπερ ἡ ζειὰ πίειραν καὶ ἀγαθήν. ἔστι δὲ δύο ταῦτα καὶ ὁμοιότατα τοῖς πυροῖς ἥ τε <ζειὰ καὶ ἡ τίφη,> ὁ δ' αἰγίλωψ καὶ ὁ βρόμος ὥσπερ ἄγρι' ἄττα καὶ ἀνήμερα.

3 Ἐπικαρπίζεται δὲ σφόδρα καὶ ὁ αἰγίλωψ τὴν γῆν, καί ἐστι πολύρριζον καὶ πολυκάλαμον· ἡ δὲ αἶρα παντελῶς ἀπηγριωμένον. τῶν δὲ ἐν τοῖς θερινοῖς ἀρότοις τὸ σήσαμον δοκεῖ χαλεπώτατον εἶναι τῇ γῇ καὶ μάλιστα καρπίζεσθαι· καίτοι πολυκαλαμώτερον καὶ παχυκαλαμώτερον καὶ πολυρριζότερον κέγχρος. διαφέρει δὲ τά τε πρὸς τὴν γῆν κοῦφα καὶ τὰ πρὸς τὴν ἡμετέραν τροφήν. ἔνια γὰρ ἐναντίως, ὥσπερ τὰ χεδροπὰ καὶ οἱ κέγχροι· καὶ τὰ πρὸς ἡμᾶς δέ, ὥσπερ ἐλέχθη, καὶ τἆλλα ζῶα. καὶ περὶ μὲν τούτων ἅλις.

X. Νοσήματα δὲ τῶν σπερμάτων τὰ μὲν κοινὰ πάντων ἐστίν, οἷον ἡ ἐρυσίβη, τὰ δ' ἴδιά τινων, οἷον ὁ σφακελισμὸς τοῦ ἐρεβίνθου, καὶ τὸ ὑπὸ καμπῶν κατεσθίεσθαι καὶ ὑπὸ ψυλλῶν, τινὰ δὲ καὶ ὑπ' ἄλλων θηριδίων. ἔνια δὲ καὶ ψωριᾷ καὶ ἁλμᾷ, καθάπερ καὶ τὸ κύμινον. τὰ δ' ἐπιγινόμενα ζῶα μὴ ἐξ αὐτῶν ἀλλ' ἐκ τῶν ἔξωθεν οὐχ ὁμοίως βλάπτει. ἐπιγίνεται γὰρ ἡ μὲν καυθαρὶς

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[1] ἥ τε ζειὰ καὶ ἡ τίφη add. W. from Galen.
[2] ὁ δ' conj. Scal.; ὅ τ' Ald.H.; ἥ τ' UMP.
[3] καίτοι conj. W.; καὶ Ald. *cf. C.P.* 4. 15. 1.
[4] τὰ add. St. [5] 8. 3. 5 *ad fin.*
[6] καὶ τὰ Ald.; καὶ οἱ τὰ UMP; ? καὶ αὖ τὰ W.

zeia, one that is fat and good. These last two,[1] *zeia* and one-seeded wheat, are also those which are likest to wheat, while[2] *aigilops* and oats are as it were wild and uncultivated things.

Aigilops also greatly exhausts the land, having many roots and many stems; while darnel is a plant which has become altogether wild. Of the crops sown at the summer seed-time sesame seems to be most severe on the land and to exhaust it most; yet[3] millet has more numerous and stouter stems and more roots. Moreover there is a difference between crops which[4] are called 'light' in relation to the soil and those called 'light' in regard to human use. For some, such as leguminous plants and millet, are light in one sense but not in the other; and, as was said,[5] what[6] is light for men is not necessarily so for the other animals. Now enough of these matters.

Of the diseases of cereals and pulses, and of hurtful winds.

X. [7]As to diseases of seeds—some are common to all, as rust, some are peculiar to certain kinds; thus chick-pea is alone subject to rot[8] and to being eaten by caterpillars and by spiders[9]; and some seeds are eaten[10] by other small creatures. Some again are liable to canker and mildew,[11] as cummin. But creatures which do not come from the plant itself but from without do not do so much harm; thus the *kantharis*[12] is a visitor among wheat, the

[7] Plin. 18. 152 and 154. [8] *cf.* 4. 14. 2.
[9] ψυλλῶν: described by Arist. *H.A.* 9. 39. 1.
[10] δὲ add. Sch.; ? κατεσθίεσθαι· κατεσθίεται δὲ καὶ ὑπὸ ψ. W.
[11] ψωριᾷ καὶ ἁλμᾷ conj. W.; ψώραις καὶ ἅλμαις Ald. *cf.* 7. 5. 4 n.
[12] Plin. 18. 156.

ἐν τοῖς πυροῖς, τὸ δὲ φαλάγγιον ἐν ὀρόβοις, ἄλλα δ' ἐν ἄλλοις.

2 Ἐρυσιβᾷ δ' ὡς ἁπλῶς εἰπεῖν τὰ σιτώδη μᾶλλον τῶν ὀσπρίων· αὐτῶν δὲ τούτων κριθὴ μᾶλλον ἢ πυρός· καὶ τῶν κριθῶν ἕτεραι ἑτέρων, μάλιστα δ' ὡς εἰπεῖν ἡ Ἀχιλληΐς. διαφέρει δὲ καὶ ἡ τῶν χωρίων θέσις καὶ ἡ φύσις οὐ μικρόν· τὰ γὰρ προσήνεμα καὶ μετέωρα οὐκ ἐρυσιβᾷ ἢ ἧττον, ἀλλὰ τὰ ἔγκοιλα καὶ ἄπνοα· γίνεται δὲ ἡ ἐρυσίβη
3 πανσελήνοις μάλιστα. ἀπόλλυται δὲ καὶ ὑπὸ τῶν πνευμάτων καὶ πυρὸς καὶ κριθή, ὅταν ἢ ἀνθοῦντα ληφθῇ ἢ ἄρτι ἀπηνθηκότα καὶ ἀσθενῆ· μᾶλλον δὲ κριθή, πολλάκις δ' ἤδη ἐν τῷ ἀδρύνεσθαι οὖσα, ἐὰν μεγάλα καὶ πλείω χρόνον ἐπιγένηται· ξηραίνει γὰρ καὶ ἀφαυαίνει, ὃ καλοῦσί τινες ἐξανεμοῦσθαι. διαπόλλυσι δὲ καὶ ἥλιος ὁ ἐκνέφελος ἄμφω καὶ μᾶλλον πυρὸν ἢ κριθήν, ὥστε μηδ' ἐπίδηλον εἶναι τὸν στάχυν τῇ ὄψει ὄντα κενόν.

4 Τὸν δὲ πυρὸν ἀπολλύουσι καὶ οἱ σκώληκες οἱ μὲν εὐθὺς κατεσθίοντες φυόμενοι τὰς ῥίζας, οἱ δὲ ὅταν αὐχμῶντες ἀποχυθῆναι μὴ δύνωνται· τότε γὰρ ἐγγινόμενος ὁ σκώληξ ἐσθίει τὸν ἀποπηνιζόμενον κάλαμον· ἐσθίει δὲ ἄχρι τοῦ στάχυος, εἶτ'

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1 Plin. 18. 154.
2 ἐρυσιβᾷ conj. W.; ἐρυσίβαι Ald.; εἰς add. Sch.
3 τὰ add. Sch. 4 *cf. C.P.* 3. 22. 2.
5 ἐρυσιβᾷ conj. Sch.; ἐρυσίβαι Ald.
6 *cf. C.P.* 4. 13. 4; Plin. 18. 151.
7 μέγαλα conj. Sch.; μεγάλη UMAld.

phalangion in vetches, and other pests in other crops.

[1] Generally speaking, cereals are more liable to rust[2] than pulses, and among these barley is more liable to it than wheat; while of barleys some kinds are more liable than others, and most of all, it may be said, the kind called 'Achillean.' Moreover the position and character of the land make no small difference in this respect; for lands which[3] are exposed to the wind[4] and elevated are not liable to rust,[5] or less so, while those that lie low and are not exposed to wind are more so. And rust occurs chiefly at the full moon. [6] Again wheat and barley are destroyed by winds, if they are caught by them either when in flower, or when the flower has just fallen and they are weak; and this applies specially to barley, indeed it occurs when the grain is already ripening, if the winds are violent[7] and last a long time; for they dry up and parch the grain, which some call being 'wind-bitten.' Also a hot sun after cloudy weather destroys both, and wheat more than barley, so that the ear is not even conspicuous, since it is empty.

Wheat is also destroyed by grubs; sometimes they eat the roots, as soon as they appear,[8] sometimes they do their work when by reason of drought the ear cannot be formed[9]; for at such times the grub is engendered, and eats the haulm as it is becoming unrolled[10]; it eats right up to the ear and then,

[8] *φυόμενοι* conj. Sch.; *φυόμενον* Ald. *cf. C.P.* 3. 22. 4.

[9] *ἀποχυθῆναι* conj. Sch. after Vin.Vo.G; *ἀπολυθῆναι* UM Ald. *cf. C.P.* 3. 22. 4; 4. 14. 1.

[10] *ἀποπηνιζόμενον*: lit. 'unwinding itself.' All edd. mark the word as corrupt.

ἐξαναλώσας ἀπόλλυται· καὶ ἐὰν μὲν ὅλον ἐκφάγῃ τελέως αὐτὸς ὁ πυρός, ἐὰν δὲ ἐπὶ θάτερον τοῦ καλάμου καὶ ἐκβιάσηται τὴν ἀπόχυσιν, τοῦτο μὲν αὖον τοῦ στάχυος θάτερον δὲ ὑγιές. γίνεται δὲ οὐ πανταχοῦ τὸ περὶ τοὺς πυρούς, οἷον ἐν Θετταλίᾳ, ἀλλὰ κατὰ χώρας τινάς, ὥσπερ ἐν τῇ Λιβύῃ καὶ τῆς Εὐβοίας ἐν τῷ Ληλάντῳ.

Σκώληκες δὲ γίνονται καὶ ἐν τοῖς ὤχροις καὶ τοῖς λαθύροις καὶ τοῖς πισοῖς, ὅταν ὑγρανθῶσι καὶ θερμημερίαι γένωνται, καθάπερ καὶ ἐν τοῖς ἐρεβίνθοις αἱ κάμπαι. πάντα δὲ ἐξαναλώσαντα τὰς τροφὰς ἀπόλλυται καὶ ἐν τοῖς χλωροῖς καὶ ἐν τοῖς ξηροῖς καρποῖς, οἷον οἵ τε ἶπες καὶ οἱ ἐν τοῖς κυάμοις ἐγγινόμενοι καὶ ἐν τοῖς ἄλλοις, ὥσπερ καὶ ἐν τοῖς δένδρεσι καὶ ἐν τοῖς ξύλοις ἐλέχθη, πλὴν τῶν κεραστῶν καλουμένων. πρὸς ἅπαντα δὴ ταῦτα μεγάλα διαφέρουσιν αἱ χῶραι οὐκ ἀλόγως· ὁ γὰρ ἀὴρ εὐθὺς διάφορος τῷ θερμὸς ἢ ψυχρὸς εἶναι ἢ ὑγρὸς ἢ ξηρός· οὗτος δ' ἦν ὁ γονεύων· δι' ὃ καὶ ἐν οἷς εἰώθασι γίνεσθαι οὐκ ἀεὶ γίνονται.

XI. Τῶν δὲ σπερμάτων οὐχ ἡ αὐτὴ δύναμίς ἐστιν εἴς τε τὴν βλάστησιν καὶ εἰς θησαυρισμόν.

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[1] *αὐτὸς*: sc. the grain. *ἀναίνεται* conj. W.; ? *αὐαίνεται αὐτὸς*.
[2] *θάτερον* conj. Sch.; *θατέρου* Ald.
[3] *cf. C P.* 3. 22. 3. *ὤχροις* conj. St.; *ὄχροις* Ald. H.
[4] *καθάπερ καὶ* conj. Sch.; *καὶ καθάπερ* Ald.
[5] *πάντα* conj. W.; *τὰ* Ald.

having consumed it, perishes. And, if it has entirely eaten it, the wheat itself[1] perishes; if however it has only eaten one[2] side of the haulm and the plant has succeeded in forming the ear, half the ear withers away, but the other half remains sound. However it is not everywhere that the wheat is so affected; for instance this does not occur in Thessaly, but only in certain regions, as in Libya and at Lelanton in Euboea.

Grubs occur also in *okhros*[3] *lathyros* and peas, whenever these crops get too much rain and then hot weather supervenes; and caterpillars occur in chick-peas under the same conditions.[4] All[5] these pests perish, when they have exhausted their food, whether the fruit in which they occur be green or dry, just as wood-worms do and the grubs found in beans and other plants, as was said of the pests found in growing trees and in felled timber. But the creature called 'horned worm'[6] is an exception. Now in regard to all these pests the position makes a great difference, as might be expected. For the climate, it need hardly be said, makes a difference according as it is hot or cold, moist or dry; and it was the climate which gave rise to these pests[7]; wherefore they are not always found even in places in which they ordinarily occur.[8]

Of seeds which keep or do not keep well.

XI. The seeds have not all the same capacity for germination and for keeping well. Some germinate

[6] *cf.* 4. 14. 5; *C.P.* 5. 10. 5.

[7] δ' ἦν ὁ γονεύων I conj.; δ' ἦν ὁ νεύων UAld.; δ' ἡνονεύων M; δ' ἐστιν ὁ γονεύων conj. Sch.; δ' ὁ γονεύων conj. W.

[8] *i.e.* because the atmospheric conditions are not always favourable to the pest.

ἔνια μὲν γὰρ βλαστάνει καὶ τελειοῦται τάχιστα καὶ θησαυρίζεται κράτιστα, καθάπερ ἔλυμος καὶ κέγχρος· ἔνια δὲ βλαστάνει μὲν εὖ ταχέως δὲ σήπεται, καθάπερ ὁ κύαμος καὶ μᾶλλον ὁ τεράμων· ταχὺ δ' ἡ ἀφάκη καὶ ὁ δόλιχος· κριθὴ δὲ πυροῦ <θᾶττον·> θᾶττον δὲ καὶ ὁ κονιορτώδης σῖτος καὶ ὁ ἐν οἰκήμασι κονιατοῖς ἢ ἀκονιάτοις.

2 Γίνεται δὴ φθειρομένοις σπέρμασι ἴδια ζῷα, καθάπερ ἐλέχθη, πλὴν ἐρεβίνθου· μόνος γὰρ οὗτος οὐ ζωογονεῖ. καὶ σηπομένοις μὲν πᾶσι σκώληξ κοπτομένοις δὲ καθ' ἕκαστον ἴδιον. πάντων δὲ μάλιστα διαμένουσιν ἐρέβινθος καὶ ὄροβος, τούτων δ' ἔτι μᾶλλον ὁ θέρμος· ἀλλ' ἔοικέ γ' οὗτος ὥσπερ ἀγρίῳ.

3 Διαφέρει δὲ ὡς ἔοικε χώρα χώρας καὶ ἀὴρ ἀέρος εἰς τὸ κόπτεσθαι καὶ μὴ τὰ σπέρματα· ἐν Ἀπολλωνίᾳ γοῦν τῇ περὶ τὸν Ἰόνιον οὐκ ἐσθίεσθαί φασιν ὅλως κύαμον, δι' ὃ καὶ εἰς θησαυρισμὸν ἀποτίθεσθαι· διαμένει δὲ καὶ περὶ Κυζικὸν ἐπὶ πλείω. μέγα δὲ πρὸς διαμονὴν καὶ τὸ ξηρὰ θερίζειν· ἐλάττων γὰρ ἡ ὑγρότης· θερίζουσι δ' ἐγχυλότερα τὰ μὲν χεδροπὰ πρὸς τὸ μᾶλλον καὶ ῥᾷον συλλέξαι, ταχὺ γὰρ καταρρεῖ καὶ αὐανθέντα

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[1] *εὖ* conj. W.; *οὐ* Ald. [2] *σήπεται* add. W.
[3] *cf.* 8. 8. 6; *C.P.* 5. 18. 2. [4] *θᾶττον* add. W.
[5] *καὶ ὁ κον. . . . ἀκονιάτοις* conj. W., *cf. C.P.* 4. 16. 1; *ὁ κονιορτώδης καὶ ὁ κονίορτος· καὶ ὁ ἐν τοῖς κονιορτοῖς ἐν ἅπασιν, οἷον κονιάτοις ἢ ἀκονιάτοις* Ald.; so also UM, but omitting *τοῖς*; U gives *κονιατοῖς*; *ἢ ὁ ἀκονίορθος* for *καὶ ὁ κονίορτος* mBas. *cf.* Plin. 18. 301, Varro 1. 57. 1, where the use of a cement of pounded marble is recommended.
[6] *δὴ φθειρομένοις* conj. Sch.; *διαφθειρομένοις* UMAld.

and mature very quickly, and keep excellently, as Italian millet and millet. Some germinate well,[1] but soon rot,[2] as beans, and especially those that are 'cookable[3]'; so do tare and calavance; also barley perishes sooner[4] than wheat; and dusty[5] grain and that which is kept in plastered store-rooms perishes sooner than that which is kept in unplastered rooms.

Again, as seeds decay,[6] they engender special creatures, except chick-pea, which alone engenders none. As they rot,[7] all produce a grub; but, as they get worm-eaten, each produces a special creature. Chick-pea and vetch keep best of all, and better still than these lupin; but this, as it were, is like a wild kind.[8]

[9]It appears that soil and climate make a difference as to whether the seed gets worm-eaten or not; at least they say that at Apollonia on the Ionian Sea beans do not get eaten in this way at all, and therefore they are put away and stored; and about Cyzicus they keep an even longer time. It also makes a great difference to keeping that the seed should be gathered dry, for then there is less moisture in it.[10] However the seeds of leguminous plants are gathered with a certain amount of moisture in them,[11] because then they can be collected in greater quantity and more easily; for otherwise they are soon shed and get shrivelled up and split[12];

[7] *i.e.* rot is produced in all cases by the same creature (σκώληξ), but the condition called being 'worm-eaten' is due in each plant to a different pest.

[8] *i.e.* and so the seed is hard and not liable to these attacks. *cf.* 8. 11. 8; *C.P.* 4. 16. 2.

[9] *cf. C.P.* 4. 16. 2. [10] *i.e.* liability to rot.

[11] ἐγχυλότερα conj. Sch.; εὐχυλότερα Ald. H. Cam.; εὐχηλότερα Bas. *cf. C.P.* 4. 13. 3. [12] Plin. 18. 125.

θρύπτεται, τοὺς δὲ πυροὺς καὶ γένος τι κριθῶν διὰ τὸ βελτίους εἰς τὰ ἄλφιτα γίνεσθαι μὴ ἀπεξηραμμένας.

4 Δι' ὃ καὶ εἰς θώμους συντιθέασι καὶ πυροὺς καὶ κριθάς, καὶ δοκοῦσιν ἀδρύνεσθαι ἐν θώμῳ μᾶλλον ἢ λιποσαρκεῖν. οὐκ ἐσθίεται δὲ σῖτος, ὅταν ὑσθεὶς θερισθῇ· ἀθέριστος δὲ μάλιστα διαμένει ὁ πυρός, ἔτι δὲ μᾶλλον ὁ θέρμος· οὐδὲ γὰρ θερίζουσι τοῦτον πρότερον ἢ ὕδωρ γενέσθαι, διὰ τὸ ἐκπηδᾶν θεριζόμενον καὶ ἀπόλλυσθαι τὸ σπέρμα.

5 Πρὸς ἔκφυσιν δὲ καὶ τὴν ὅλην σποράν ἄριστα δοκεῖ τὰ ἑνάεινα· τὰ δὲ δίενα χείρω καὶ τὰ τρίενα, τὰ δ' ὑπερτείνοντα σχεδὸν ἄγονα, πρὸς δὲ τὴν σίτησιν ἀρκοῦντα. βίος γάρ ἐστιν ἑκάστοις ὡρισμένος εἰς γονήν. καίτοι καὶ ταύταις παραλλάττει ταῖς δυνάμεσι διὰ τοὺς τόπους ἐν οἷς ἂν θησαυρίζωνται. τῆς γοῦν Καππαδοκίας ἐν χωρίῳ τινὶ τῷ καλουμένῳ Πέτρᾳ καὶ τετταράκοντα ἔτη διαμένειν φασὶ γόνιμα καὶ χρήσιμα πρὸς σπόρον, εἰς δὲ τὴν σίτησιν ἑξήκοντα ἢ ἑβδομήκοντα· τὸ γὰρ ὅλον οὐ κόπτεσθαι· τὰ δὲ ἱμάτια καὶ τὴν ἄλλην
6 γάζαν κόπτεσθαι. τὸ γὰρ χώριον ἄλλως τε ὑψηλὸν εἶναι καὶ εὔπνουν καὶ ἔναυρον αἰεὶ καὶ ἀπ' ἀνατολῆς ἔχουσι καὶ δύσεως καὶ μεσημβρίας.

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[1] ἢ λιποσαρκεῖν conj. H.; ἡλίκα σωρῶν U; ἡλίκα σαρκῶν M. W. brackets as due to a gloss. *cf. C.P.* 4. 13. 6.

[2] ὅταν ὑσθεὶς conj. Scal.: so Vo.; ὁ τανυσθεὶς Bas.Cam. θερισθῇ conj. W.; περιφυῇ MSS.

and wheat and one kind of barley are gathered before they are dry, because then they are better for meal.

Wherefore the grain of wheat and barley is put into heaps, and it seems to ripen in a heap rather than to lose substance.[1] (However corn does not get worm-eaten when it is reaped after exposure to rain.)[2] Also corn lasts better than other things if it is left standing, and so does lupin to an even greater extent; indeed this crop is not even gathered till rain has fallen,[3] because, if it is gathered, the seed springs out and is lost.

Of the age at which seeds should be sown.

[4]For propagation and sowing generally seeds one year old seem to be the best; [5]those two or three years old are inferior, while those kept a still longer time are infertile, though they are still available as food. For each kind has a definite period of life in regard to reproduction. However these seeds too differ in their capacity according to the place in which they are stored. For instance, in Cappadocia at a place called Petra they say that seed remains even for forty years fertile and fit for sowing, while as food it is available for sixty or seventy years; for that it does not get worm-eaten at all like clothes and other stored-up articles. for that the region is, apart from this, elevated and always exposed to fair winds and breezes which prevail alike from[6] the east, the west, and the

[3] πρότερον ἢ conj. W.; τὸν τρόπον UAld. *cf. C.P.* 4. 13. 3; Plin. 18. 133. [4] Plin. 18. 195.
[5] *cf.* 7. 5. 5; *Geop.* 2. 16.
[6] ἀπ' conj. Sch.; ἐπὶ P_2Ald.

φασὶ δὲ καὶ ἐν Μηδείᾳ καὶ ταῖς ἄλλαις ταῖς ὑψηλαῖς χώραις διαμένειν θησαυριζόμενα πολὺν χρόνον. ἐρέβινθον δὲ δὴ καὶ θέρμον καὶ ὄροβον καὶ κέγχρον καὶ τὰ τοιαῦτα δῆλον ὅτι πολλῷ πλείω τούτων, ὥσπερ καὶ ἐν τοῖς περὶ τὴν Ἑλλάδα τόποις. ἀλλὰ ταῦτα μέν, ὥσπερ εἴρηται, τῶν τόπων ἴδια.

7 Δοκεῖ δὲ καὶ γῆ τις εἶναι παρά τισιν ἣ διαπαττομένη[2] συντηρεῖ τὸν πυρόν, ὥσπερ ἥ τε ἐν Ὀλύνθῳ καὶ ἐν Κηρίνθῳ τῆς Εὐβοίας· ποιεῖ δὲ χείρω μὲν εἰς τὴν σίτησιν ἀδρότερον δὲ τῇ προσόψει· παραπάττουσι[3] δὲ κοίνικα εἰς τὸν μέδιμνον.

Πυρωθέντα πάντα τὰ σπέρματα ἀπόλλυται καὶ ἀβλαστῆ γίνεται· καίτοι περί γε Βαβυλῶνά φασι τὰς κριθὰς καὶ τοὺς πυροὺς ἐπὶ τῆς ἄλω πηδᾶν, ὥσπερ τὰ φρυγόμενα· ἀλλὰ δῆλον ὅτι διαφορά τίς ἐστι τῆς θερμότητος, ἢ ἁπλῶς πως θερμασίᾳ γίνεται [καὶ] ἡ πήδησις. καὶ τὰ μὲν τοιαῦτα σχεδὸν ὡσπερεὶ κοινὰ δόξειεν ἂν εἶναι πάντων ἢ τῶν πλείστων.

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[1] *cf. C.P.* 5. 18. 3; for millet-seed see *J.H.S.* vol. xxxv. part i. p. 22.

[2] διαπαττομένη conj. H.; διαπλαττομένη UMAld.; διακοπτομένη P_2. *cf.* Plin. 18. 305.

[3] παραπάττουσι conj. Sch., *cf. Geop.* 2. 21. 3; {ἐμπάσσειν}; παρατάττουσι UMAld. *cf.* Varro 1. 57. 1.

south. They say that in Media[1] also and other elevated countries the seed when stored keeps for a long time. And it is plain that chick-pea lupin vetch millet and the like will keep a far longer time than these seeds, as they do even in districts of Hellas. However these peculiarities, as has been said, are due to the particular region.

Of artificial means of preserving seed.

There appears to be a kind of earth in some places, which when sprinkled[2] over the seed helps to make wheat keep, for instance, the earth found at Olynthos and at Kerinthos in Euboea; this makes the grain inferior for food, but fuller in appearance; the earth is sprinkled[3] in the proportion of one pint to twenty-four of grain.

Of the effect of heat on seeds.

All seeds if exposed to fire perish and become infertile. Yet they say that at Babylon[4] the grains of barley and wheat jump on the threshing-floor like corn which is being parched. However it is plain that it is some particular kind of warmth[5] which produces this effect: or else the jumping is simply another effect of heat.[6] Such behaviour would appear to be common to most,[7] if not to all kinds.

[4] *i.e.* the grain is there exposed to great *sun*-heat. *cf. de igne* 44.

[5] *i.e.* the sun's heat is different in kind, and therefore in effect, to that of a fire.

[6] θερμασίᾳ conj. Sch.; θερμασία Ald.H.

[7] ὥσπερεὶ κοινὰ conj. Sch. from G; ὥσπερ εἰκόνα UM; ὥσπερ εἰκόνες Ald.H.

8 Ἔνια δὲ ἔχει τινὰ ἰδιότητα καὶ τῶν δοκούντων ὥσπερ ἀγρίων εἶναι καὶ κατὰ τὴν γένεσιν καὶ τὴν ἔκφυσιν, ὥσπερ ὁ θέρμος καὶ ὁ αἰγίλωψ· ὁ μὲν γὰρ θέρμος καίπερ ἰσχυρότατος ὢν ὅμως, ἐὰν μὴ εὐθὺς ἀπὸ τῆς ἅλω καταβληθῇ, κακοφυὴς γίνεται, καθάπερ ἐλέχθη, καὶ τὸ ὅλον δὲ οὐκ ἐθέλει κρύπτεσθαι τῇ γῇ, δι' ὃ καὶ οὐχ ὑπαροῦντες σπείρουσι· πολλάκις δὲ κἂν εἰς ὕλην ἢ βοτάνην τινὰ πέσῃ, διωσάμενος ταύτην συνάπτει τὴν ῥίζαν τῇ γῇ καὶ βλαστάνει. χώραν δὲ ὕφαμμον ζητεῖ καὶ φαύλην μᾶλλον, τὸ δὲ ὅλον οὐκ ἐθέλει φύεσθαι ἐν διειργασμένῃ.

9 Ὁ δὲ αἰγίλωψ ἀνάπαλιν· ἐν γὰρ τῇ γεωργουμένῃ κάλλιον· καὶ ἐνιαχοῦ δὲ πρότερον ἀβλαστὴς ὢν ἐὰν γεωργηθῇ βλαστάνει καὶ γίνεται πολύς, καὶ ὅλως δὲ φιλεῖ χώραν ἀγαθήν. ἴδιον δὲ αὐτοῦ λέγεται πρὸς τὰ ἄλλα τὰ σιτώδη σπέρματα καὶ ἡ παρ' ἐνιαυτὸν βλάστησις ἑκατέρου τῶν σπερμάτων. δι' ὃ καὶ οἱ βουλόμενοι τελέως φθεῖραι, δύσφθαρτον γὰρ δὴ φύσει τυγχάνει, τὰς ἀρούρας ἀνιᾶσιν ἀσπόρους ἐπὶ δύο ἔτη, καὶ ὅταν ἀναβλαστήσῃ τὰ πρόβατα ἐπαφιᾶσι πολλάκις, ἕως ἂν ἐκνεμηθῶσι, καὶ αὕτη γίνεται φθορὰ παντελής· ἅμα δὲ τοῦτο μαρτυρεῖ καὶ τὴν παρὰ μέρος βλάστησιν.

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[1] καὶ conj. Sch.; ἢ Ald.H.
[2] *cf.* 8. 1. 3. [3] *cf. C.P.* 4. 7. 3.
[4] ὑπαροῦντες conj. H.; ὑπαποροῦντες UMAld. *cf. C.P.* 3.20.8.

Of certain peculiarities of the seed of lupin and aigilops.

Some even[1] of those kinds which seem to be more or less wild have peculiarities as to their germination and growth, for instance, lupin and *aigilops*. For lupin, although it is very robust, unless it is planted immediately after leaving the threshing-floor,[2] turns out of poor growth, as was said, and refuses altogether to be buried in the ground;[3] wherefore they sow it without first ploughing[4] the land. And often if the seed has fallen amid thick undergrowth or herbage,[5] it thrusts this aside, fastens on to the earth with its root and grows vigorously. It seeks sandy and poor soil for choice, and will not grow at all in[6] cultivated[7] soil.

Aigilops has the opposite character; it grows better in tilled soil; and in some places where at first it would not grow, if the ground is tilled, it grows and yields a large crop, and in general it likes good soil. A peculiarity[8] mentioned in regard to it as compared with other cereal seeds is that one seed in two does not germinate for a year. Wherefore those who wish to destroy it entirely, (since it is naturally hard to destroy), leave the fields unsown for two years, and, when it springs up, send in[9] the sheep several times till they have grazed it down, and this is a way of completely destroying it. At the same time this testifies to the fact that the seed does not all germinate at once.

[5] *cf.* 1. 7. 3; Plin. 18. 134. [6] ἐν conj. W.; τῇ Ald. H.
[7] *cf.* 8. 11. 2. [8] *cf. C. P.* 4. 6. 1.
[9] ἐπαφιᾶσι conj. Sch., *cf.* 8. 7. 4; ἀφιῆσι M; ἀφίησι P; ἀφίασι Ald.

BOOK IX

I

I. Ἡ *ὑγρότης οἰκεία τῶν φυτῶν, ἣν δὴ καλοῦσί τινες ὀπὸν ὀνοματι κοινῷ προσαγορεύοντες· δύναμιν δὲ ἔχει δῆλον ὅτι τὴν καθ' αὑτὴν ἑκάστη. χυμὸς δὲ ταῖς μὲν μᾶλλον ταῖς δ' ἧττον ἀκολουθεῖ, ταῖς δ' ὅλως οὐκ ἂν δόξειεν, οὕτως ἀσθενὴς καὶ ὑδαρής τίς ἐστι. πλείστη μὲν οὖν ὑπάρχει πᾶσι κατὰ τὴν βλάστησιν, ἰσχυροτάτη δὲ καὶ μάλιστα ἐκφαίνουσα τὴν ἑαυτῆς φύσιν ὅταν ἤδη παύσηται καὶ βλαστάνοντα καὶ καρπογονοῦντα. συμβαίνει δέ τισι τῶν φυτῶν καὶ χρόας ἰδίας ἔχειν· τοῖς μὲν λευκὰς οἷον τοῖς ὀπώδεσι, τοῖς δ' αἱματώδεις οἷον τῷ κενταυρίῳ καὶ τῇ ἀτρακτυλίδι καλουμένῃ ἀκάνθῃ, τοῖς δὲ χλωρόν, τοῖς δ' ἐν ἄλλῃ χρόᾳ. ἔνδηλα δὲ μᾶλλον ταῦτα ἐν τοῖς ἐπετείοις καὶ τοῖς ἐπετειοκαύλοις ἢ τοῖς δένδροις.*

2 Ἡ δ' *ὑγρότης τῶν μὲν πάχος ἔχει μόνον, ὥσπερ τῶν ὀπωδῶν· τῶν δὲ καὶ δακρυώδης γίνεται, καθάπερ ἐλάτης πεύκης τερεβίνθου πίτυος ἀμυγδαλῆς κεράσου προύμνης ἀρκεύθου κέδρου τῆς ἀκάνθης τῆς Αἰγυπτίας πτελέας, καὶ γὰρ αὕτη φέρει κόμμι*

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[1] *cf. C.P.* 6. 11. 16.

[2] I have omitted *ἡ* and restored *δὲ* before *ἔχει* (om. Scal.; found in UMAld.).

[3] *τῷ κενταυρίῳ* conj. Scal. *cf.* Plin. 25. 32; *κενταυρίδι* conj. St.; *κευτηρίᾳ* P_2Ald.G, *cf.* 9, 8. 7.

BOOK IX

Of the Juices of Plants, and of the Medicinal Properties of Herbs.

Of the various kinds of plant-juices and the methods of collecting them.

I. [1] Moisture belongs to plants as such and some call it the 'sap,' to give it a general name; and it plainly has [2] special qualities in each plant. This moisture is attended by a taste, in some cases more, in some less, while in some it would seem to have none, so weak and watery is it. Now all plants have most moisture at the time of making growth, but it is strongest and most shows its character when the plant has ceased to grow and to bear fruit. Again in some plants the juice has a special colour; in some it is white, as in those which have a milky juice; in some blood-red, as in centaury [3] and the spinous plant which is called distaff-thistle; in some green: and in some of other colours. And these qualities are more obvious in annual [4] plants and those with annual stems than in trees.

Again in some plants the juice is merely thick, as in those in which it is of milky character; but in some it is of gummy character, as in silver-fir fir terebinth Aleppo pine almond *kerasos* (bird-cherry) bullace Phoenician cedar prickly cedar acacia elm.[5] For

[4] *ἐν* inserted here by W. instead of before *τοῖς ἐπετείοις*.

[5] *πτελέας* after *κέδρου* P_2Ald.; transposed by Sch. after Tobias Aldinus. *cf.* Plin. 13. 67.

πλὴν οὐκ ἐκ τοῦ φλοιοῦ ἀλλ' ἐν τῷ κωρύκῳ, ἔτι δὲ ἀφ' ὧν ὁ λίβανος καὶ ἡ σμύρνα, δάκρυα γὰρ καὶ ταῦτα, καὶ τὸ βάλσαμον καὶ <ἡ> χαλβάνη καὶ εἴ τι τοιοῦτον ἕτερον, οἷόν φασι τὴν ἄκανθαν τὴν Ἰνδικήν, ἀφ' ἧς γίνεταί τι ὅμοιον τῇ σμύρνῃ· συνίσταται δὲ καὶ ἐπὶ τῆς σχίνου καὶ ἐπὶ τῆς ἀκάνθης τῆς ἰξίνης καλουμένης, ἐξ ὧν ἡ μαστίχη.

3 Ἅπαντα δὲ ταῦτα εὔοσμα καὶ σχεδὸν ὅσα πιότητά τινα ἔχει καὶ λῖπος· ὅσα δ' ἀλιπῆ ταῦτα δ' ἄοσμα, καθάπερ τὸ κόμμι καὶ τὸ τῆς ἀμυγδαλῆς. ἔχει δὲ δάκρυον καὶ ἡ ἰξία ἡ ἐν Κρήτῃ καὶ ἡ τραγάκανθα καλουμένη· ταύτην δὲ πρότερον ᾤοντο μόνον ἐν Κρήτῃ φύεσθαι, νῦν δὲ φανερὰ καὶ ἐν Ἀχαΐδι τῆς Πελοποννήσου καὶ ἄλλοθι καὶ τῆς Ἀσίας περὶ τὴν Μήδειαν. καὶ τούτων μὲν πάντων ἔν τε τοῖς καυλοῖς καὶ τοῖς στελέχεσι καὶ τοῖς ἀκρεμόσι τὸ δάκρυον· ἐνίων δ' ἐν ταῖς ῥίζαις, ὥσπερ τοῦ ἱπποσελινου καὶ τῆς σκαμμωνίας καὶ ἄλλων πολλῶν φαρμακωδῶν. τῶν δὲ καὶ ἐν τῷ καυλῷ καὶ ἐν τῇ ῥίζῃ· καὶ γὰρ τὸν καυλὸν ὀπίζουσιν ἐνίων καὶ τὰς ῥίζας, ὥσπερ καὶ τοῦ σιλφίου.

4 Τὸ μὲν οὖν τοῦ ἱπποσελίνου παρόμοιον τῇ σμύρνῃ· καί τινες ἀκούσαντες ὡς ἐντεῦθεν ἡ σμύρνα ἡγοῦνται βλαστάνειν ἐξ αὐτῆς ἱπποσέ-

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[1] *κωρύκῳ* conj. Sch.; *ἀγγείῳ* H.; *ἀγείῳ* P_2Ald. probably a gloss on *κωρύκῳ*, for which *cf.* 2. 8. 3 and reff. in note. Plin. *l.c.* has preserved the right word through an absurd blunder —*in Coryco monte Ciliciae.*

this last also produces a gum, though it does not exude from the bark, but is found in the 'bag'[1] of the leaves; there are also the juices from which come frankincense and myrrh; for these too are gums; so too are balsam of Mecca *khalbane*[2] and any others of the kind that there may be, such as, they say, the Indian *akantha*, from which comes something[3] resembling myrrh; and a similar substance forms on mastich and the spinous plant called *ixine* (pine-thistle), whence mastic-gum is made.

All these have a fragrant odour, as in general have those which contain a viscous substance and are fatty; while those that are not fatty have no scent, as gum and the juice which exudes from the almond. The pine-thistle[4] of Crete has also a gum, and so has the plant called tragacanth;[5] this was formerly supposed to grow only in Crete, but now it is well known to grow also in Achaia in the Peloponnese and elsewhere in Hellas and in Asia in the Median country. In all these plants the gum occurs in the stems the trunks and the branches, but in some plants it is found in the roots, as in alexanders scammony and many other medicinal plants. In some it is found in the stem and also in the root;[6] for of some[7] plants they tap the stem and the roots as well, as is done with silphium.

Now the juice of alexanders is like myrrh, and some, having heard that myrrh comes from it, have supposed that, if myrrh is sown, alexanders comes up

[2] *galbanum*. *cf.* Plin. 12. 121; 24. 21. Verg. *G.* 3. 415; 4. 264. See 9. 7. 2; 9. 9. 2 n.
[3] *τι* I conj.; *τὸ* MSS. [4] *ἰξία* = *ἰξίνη*. See Index.
[5] Plin. 13. 115. [6] *cf. C.P.* 6. 11. 15.
[7] *ἐνίων καὶ* conj. Sch.; *καὶ ἐνίων* Ald.

λινον· φυτεύεται γάρ, ὥσπερ ἐλέχθη, καὶ ἀπὸ δακρύου τὸ ἱπποσέλινον, καθάπερ ἡ κρινωνία καὶ ἄλλα. τὸ δὲ τοῦ σιλφίου δριμύ, καθάπερ αὐτὸ τὸ σίλφιον· ὁ γὰρ ὀπὸς καλούμενος τοῦ σιλφίου δάκρυόν ἐστιν. ἡ δὲ σκαμμωνία καὶ εἴ τι ἄλλο τοιοῦτον, ὥσπερ ἐλέχθη, φαρμακώδεις ἔχουσι τὰς δυνάμεις.

5 Πάντων δὲ τῶν εἰρημένων τὰ μὲν αὐτομάτως συνίσταται, τὰ δ' ἀπ' ἐντομῆς, τὰ δ' ἀμφοτέρωθεν· τέμνουσι δὲ δῆλον ὅτι τὰ χρήσιμα καὶ τὰ μᾶλλον ἐπιζητούμενα. τοῦ δ' ἀπὸ τῆς ἀμυγδαλῆς οὐδεμία χρεία δακρύου, δι' ὃ κοὐκ ἀφελκοῦσι. πλὴν ἐκεῖνό γε φανερὸν ὅτι ὧν αὐτόματος ἡ πῆξις
6 τούτων πλείων ἡ ἐπιρροὴ τῆς ὑγρότητος. οὐ τὴν αὐτὴν δ' ὥραν ἁπάντων αἱ ἐντομαὶ καὶ ἡ πῆξις, ἀλλὰ τὸ μὲν τῆς ἀμπέλου μάλιστα συνίστασθαί φασιν ἐὰν μικρὸν πρὸ τῆς βλαστήσεως τμηθῇ, τοῦ δὲ μετοπώρου καὶ ἀρχομένου τοῦ χειμῶνος ἧττον· καίτοι πρός γε καρποτοκίαν αἱ ὡραιότατα ταῖς γε πλείσταις αὗται. τῆς δὲ τερμίνθου καὶ τῆς πεύκης καὶ εἰ ἔκ τινων ἄλλων ῥητίνη γίνεται μετὰ τὴν βλάστησιν· τὸ δ' ὅλον οὐκ ἐπέτειος ἡ τούτων, ἀλλ' εἰς πλείω χρόνον ἡ ἐντομή. τὸν δὲ λιβανωτὸν καὶ τὴν σμύρναν ὑπὸ Κύνα φασὶ καὶ ταῖς θερμοτάταις ἡμέραις ἐντέμνειν· ὡσαύτως δὲ καὶ τὸ ἐν Συρίᾳ βάλσαμον.

7 Ἀκριβεστέρα δὲ καὶ ἐλάττων ἡ καὶ τούτων

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[1] ἐξ αὐτῆς conj. Scal.: *cf.* Plin. 19. 162, where *smyrnium* is given as a synonym; ἐν αὐτοῖς Ald.
[2] *cf.* 2. 2 1; 6. 6. 8; *C.P.* 1. 4. 6.
[3] 9. 1. 3. [4] *cf. C.P.* 6. 11. 15.

from it;[1] for, as was said,[2] this plant can be grown from an exudation, like the *krinonia* (lily) and other plants. The juice of silphium is pungent like the plant itself; for what is called the 'juice' of silphium is a gum. Scammony and similar plants, as was said,[3] have medicinal properties.

In all the plants mentioned the juice either forms naturally, or when incisions are made, or in both ways,[4] but it is obvious that men only make incisions in plants whose juice is of use and is specially sought after.[5] Now there is no use in the gum which exudes from the almond, wherefore men do not tap it.[6] However it is plain that in plants whose gum forms naturally the flow of juice is greater. The incisions and the clotting of the juice do not take place at the same season in all cases;[7] but the juice of the vine clots best they say if the incision is made a little before budding begins, less well in the autumn or at the beginning of winter; (although in regard to production of fruit these[8] seasons are the best in the case of most[9] vines). However with terebinth fir or any other tree which produces resin the best time is after the period of budding; yet in general these trees are not cut every year, but at longer intervals. The frankincense and myrrh trees they say should be cut at the rising of the Dogstar and on the hottest days, and so also the 'Syrian balsam' (balsam of Mecca).

The cutting of these is also a more delicate matter

[5] μᾶλλον ἐπιζητούμενα· τοῦ δ' ἀπὸ τῆς ἀ. conj. W. supported by G; μᾶλλον· ἐπὶ γοῦν τὸ ἀπὸ τῆς ἀ. UMAld.

[6] κοὐκ ἀφελκοῦσιν conj. Scal., *cf.* 9. 2. 1; κἀν ἀφέλκουσιν U; κἀν ἀφέλκωσι MAld. *cf.* Plin. 24. 105.

[7] Plin. 24. 106. [8] α *i*conj. W.; καὶ UPAld.

[9] γε conj. Sch.; δὲ Ald. *cf. C.P.* 3. 13. 2.

ἐντομή· καὶ γὰρ ἡ συρροὴ τῆς ὑγρότητος ἐλάττων· ὧν δὲ καὶ ὁ καυλὸς ἐντέμνεται καὶ ἡ ῥίζα, τούτων ὁ καυλὸς πρότερον, ὥσπερ καὶ τοῦ σιλφίου, καὶ καλοῦσι δὲ τῶν ὀπῶν τούτων τὸν μὲν καυλίαν τὸν δὲ ῥιζίαν· καί ἐστι βελτίων ὁ ῥιζίας· καθαρὸς γὰρ καὶ διαφανὴς καὶ ξηρότερος. ὁ δὲ καυλίας ὑγρότερος· καὶ διὰ τοῦτο ἄλευρον αὐτῷ περιπάττουσι πρὸς τὴν πῆξιν. τὴν ὥραν τῆς ἐντομῆς ἴσασιν οἱ Λίβυες· οὗτοι γὰρ οἱ σίλφιον λέγοντες. ὡσαύτως δὲ καὶ οἱ ῥιζοτόμοι καὶ οἱ τοὺς φαρμακώδεις ὀποὺς συλλέγοντες· καὶ γὰρ οὗτοι τοὺς καυλοὺς ὀπίζουσι πρότερον. ἁπλῶς δὲ πάντες καὶ οἱ τὰς ῥίζας καὶ οἱ τοὺς ὀποὺς συλλέγοντες τὴν οἰκείαν ὥραν ἑκάστων τηροῦσι. καὶ τοῦτο μὲν δὴ κοινόν.

II. Ἡ δὲ ῥητίνη γίνεται τόνδε τὸν τρόπον· ἐν μὲν τῇ πεύκῃ ὅταν ἀφελκωθείσης ἡ δᾷς ἐξαιρεθῇ, συρρεῖ γὰρ εἰς τὸ ἕλκωμα τοῦτο πλείων ἡ ὑγρότης, ἐν δὲ τῇ ἐλάτῃ καὶ τῇ πίτυϊ ὅταν γευσάμενοι τῶν ξύλων ἀφελκώσωσιν· οὐ γὰρ πᾶς ἀφορισμὸς ὁμοίως· ἀφελκοῦσι γὰρ καὶ τὰς τερμίνθους ἐν ἀμφοῖν καὶ ἐν τῷ στελέχει καὶ ἐν τοῖς ἀκρεμόσιν· αἰεὶ δὲ πλείων καὶ βελτίων ἡ εἰς τὸ στέλεχος συρρέουσα τῆς εἰς τοὺς ἀκρεμόνας.

2 Διαφέρουσι δὲ καὶ κατὰ τὰ δένδρα. βελτίστη μὲν γὰρ ἡ τερμινθίνη· καὶ γὰρ συνεστηκυῖα καὶ εὐωδεστάτη καὶ κουφοτάτη τῇ ὀσμῇ ἀλλ' ὀλίγη. δευτέρα δὲ ἡ ἐλατίνη καὶ πιτυΐνη, κουφότεραι γὰρ τῆς πευκίνης. πλείστη δὲ ἡ πευκίνη καὶ

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[1] *cf.* 6. 3. 2; *C.P.* 6. 11. 16.

[2] *σίλφιον* conj. St.; *σιλφίου* UM; *σιλφιολέγοντες* PAld.

and is done on a smaller scale; for the flow of juice is less. In those plants whose stem and root are both cut the stem is cut first, as also with silphium; and the juices so obtained are called respectively stalk-juice and root-juice, of which the latter is the better, for it is clear transparent and less liquid. The stalk-juice is more liquid, and for this reason they sprinkle meal [1] over it to make it clot. The Libyans know the season for cutting, for it is they that gather the silphium.[2] So also do the root-diggers and those that collect medicinal juices, for these too tap the stems earlier. And in general all those who collect whether roots or juices observe the season which is appropriate in each case. And this remark applies generally.

Of resinous trees and the methods of collecting resin and pitch.

II. [3] Resin is made in the following manner:—in fir it is done by removing the resinous wood after the tree has been tapped; for then the juice flows into the hole so made in greater abundance; in silver-fir and Aleppo pine it is done by tapping the wood, after tasting it. For there is no fixed rule for all alike; thus with terebinth they tap both the stem and the branches; but the juice which runs into the stem is always more abundant and better than that which flows into the branches.

There are also differences in [4] the resin obtained from different trees. The best is that of terebinth; for it sets firm, is the most fragrant, and has the most delicate smell; but the yield is not abundant. Next comes that of silver-fir and Aleppo pine, for these are more delicate than that of the fir. But that of the fir

[3] Plin. 16. 57. [4] κατὰ conj. W.; ταῦτα Ald. H.

βαρυτάτη καὶ πιττωδεστάτη διὰ τὸ μάλιστα ἔνδαδον εἶναι τὴν πεύκην. ἄγεται δὲ ἐν ἀσκοῖς ὑγρά, κἄπειτα οὕτω συνίσταται. καίτοι φασὶ καὶ τὴν τέρμινθον πιττοκαυτεῖσθαι[1] περὶ Συρίαν· ἔστι γὰρ ὄρος, καθάπερ ἐν τοῖς ἔμπροσθεν εἴπομεν, μέγα τερμίνθων μεστὸν ἅπαν μεγάλων.

3 Ἔνιοι δέ φασι καὶ τὴν πίτυν καὶ τὴν κέδρον δὲ τὴν Φοινικικήν· ἀλλὰ ταῦτα μὲν ὡς ἐνδεχόμενα ληπτέον διὰ τὸ σπάνιον· ἐπεὶ οἵ γε περὶ Μακεδονίαν οὐδὲ τὴν πεύκην πιττοκαυτοῦσιν ἀλλ' ἢ τὴν ἄρρενα· καλοῦσι γὰρ ἄρρενα τὴν μὴ καρποφόρον. τῆς δὲ θηλείας ἐάν τινα τῶν ῥιζῶν λάβωσιν· ἅπασα γὰρ ἔνδαδος πεύκη ταῖς ῥίζαις. καλλίστη δὲ πίττα γίνεται καὶ καθαρωτάτη ἡ ἐκ τῶν σφόδρα προσείλων καὶ προσβόρρων, ἐκ δὲ τῶν παλισκίων βλοσυρωτέρα καὶ βορβορώδης· ἐν γὰρ τοῖς σφόδρα παλισκίοις οὐδὲ φύεται πεύκη τὸ παράπαν.

4 Ἔστι δὲ καὶ ἀφορία τις καὶ εὐφορία καὶ πλήθους καὶ καλλονῆς· ὅταν μὲν γὰρ χειμὼν μέτριος γίνηται, πολλὴ γίνεται καὶ καλὴ καὶ τῷ χρώματι λευκοτέρα, ὅταν δὲ ἰσχυρός, ὀλίγη καὶ μοχθηροτέρα. καὶ ταῦτά γέ ἐστι τὰ ὁρίζοντα πλῆθος καὶ καλλονὴν πίττης, οὐχ ἡ πολυκαρπία τῶν πευκῶν.

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[1] πιττοκαυτεῖσθαι conj. Sch., *cf.* 9. 3. 4; πιττοκαυθίσαι U; πιττωθεῖσαι Ald. [2] 3. 2. 6.

[3] δὲ conj. W.; καὶ Ald.H. *cf.* 3. 12. 3.

[4] μὴ conj. W.; γε Ald.H.; γε μὴ Cod.Casaub.Vin.; γε μὴν Vo. (τὴν ἄκαρπον mBas.). *cf.* 3. 9. 2.

[5] Plin. 16. 59.

is the most abundant, the grossest and the most pitch-like, because this tree has the greatest amount of resinous wood. It is carried about in baskets in a liquid state, and so acquires the more solid form which we know. However they say that in Syria pitch is extracted even from the terebinth by burning[1]; for there is in that land a mountain which, as we said before,[2] is all covered with great terebinths.

Some[3] say the same of Aleppo pine and also of Phoenician cedar; but this must be taken as only indicating what *can* be done, the practice not being common; for the people of Macedonia do not extract pitch by burning even from fir, except from the 'male' kind (they call the kind which bears no fruit[4] the 'male'); the 'female' kind they only treat in this way when they have found roots containing pitch; for all firs have resinous wood extending to the roots. [5]The finest and purest pitch is that obtained from trees growing in a sunny position and facing north[6]; that obtained from trees growing in shade is coarser[7] and muddy; (in exceedingly shady places the fir does not even grow at all).

Again the yield may be either good or bad as to amount and as to quality; thus, when there is a moderate winter, it is abundant and good and whiter in colour, but, when there is a severe winter, it is scanty and of inferior quality. And it is these conditions, and not the tree's capacity for bearing fruit, which determine the amount and quality of pitch.

[6] Apparently because this is the dry quarter in the Balkan peninsula.

[7] *βλοσωρωτέρα* conj. Sch.; *βροσηροτέρα* M; *βλοσηροτέρα* Ald. *cf C.P.* 6. 12. 5.

5 Οἱ δὲ περὶ τὴν Ἴδην φασί, διαιροῦντες τὰς πεύκας καὶ τὴν μὲν καλοῦντες Ἰδαίαν τὴν δὲ παραλίαν, τὴν ἐκ τῆς Ἰδαίας πλείω καὶ μελαντέραν γίνεσθαι καὶ γλυκυτέραν καὶ τὸ ὅλον εὐωδεστέραν ὠμήν, ἑψηθεῖσαν δὲ ἐλάττω ἐκβαίνειν· πλείω γὰρ ἔχειν τὸν ὀρρόν, δι' ὃ καὶ λεπτοτέραν εἶναι. τὴν δὲ τῆς παραλίας ξανθοτέραν καὶ παχυτέραν ὠμήν, ὥστε καὶ τὴν ἄφεψιν ἐλάττω γίνεσθαι, δᾳδωδεστέραν δὲ τὴν Ἰδαίαν. ὡς δὲ ἁπλῶς εἰπεῖν ἐκ τῆς ἴσης δᾳδὸς πλείω καὶ ὑδαρεστέραν ἐν ταῖς ἐπομβρίαις γίνεσθαι ἢ ἐν τοῖς αὐχμοῖς, καὶ ἐκ τῶν χειμερινῶν καὶ παλισκίων τόπων ἢ ἐκ τῶν εὐείλων καὶ εὐδιεινῶν. ταῦτα μὲν οὖν οὕτως ἑκάτεροι λέγουσιν.

6 Ἀναπληροῦσθαι δὲ συμβαίνει τὰ κοιλώματα πρὸς τὸ πάλιν ἐξαιρεῖν τῶν μὲν ἀγαθῶν πευκῶν ἐνιαυτῷ, τῶν δὲ μετριωτέρων ἐν δυσὶν ἔτεσι, τῶν δὲ μοχθηρῶν ἐν τρισίν. ἡ δὲ ἀναπλήρωσις οὐ τοῦ ξύλου καὶ τῆς συμφύσεως ἀλλὰ τῆς πίττης ἐστίν· ἐπεὶ τὸ ξύλον ἀδύνατον συμφῦναι καὶ ἓν γενέσθαι πάλιν, ἀλλ' ἡ ἐργασία διὰ τοσούτου χρόνου γίνεται τῆς πίττης· ἀναγκαῖον δὲ δῆλον ὅτι καὶ τῷ ξύλῳ γίνεσθαί τινα πρόσφυσιν, εἴπερ

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[1] Plin. 16. 60.

[2] εὐωδεστέραν H.; εὐκρινωδεστέραν UMAld.; ? εὐκρινεστέραν καὶ εὐωδεστέραν W. *cf* 3. 9. 2.

[3] Plin. *l.c.*

The people of Mount Ida distinguish different kinds of fir, calling one 'that of Mount Ida' (Corsican pine), another the 'fir of the seashore,' (Aleppo pine);[1] and they say that the pitch obtained from the former is more abundant blacker sweeter and generally more fragrant[2] in the raw state, but that boiling down reduces the amount; for that it contains a larger proportion of watery matter, wherefore it is less substantial; but that derived from the 'fir of the seashore' is browner and thicker in the raw state, so that the amount is less reduced by boiling down; that the 'fir of Mount Ida' however contains more resinous wood. And, speaking generally, they say that from an equal amount of resinous wood more pitch is obtained and in a more liquid state in wet weather than during a drought, and from a wintry and shady position than from one that is sunny and enjoys fair weather. Such is the account given by the peoples of Mount Ida and of Macedonia respectively.

[3] The holes for the pitch fill up, so that the pitch can be again removed,[4] in good firs in a year, in those of more moderate quality in two years, in poor trees in three. The filling-up is composed of the pitch; it is not caused by closing up of the wood; for the wood cannot close up and become one again, but the effect which takes the time mentioned is due to the formation of the pitch.[5] However it is clearly inevitable that there should be some new growth of the wood too, seeing that the resinous wood is

[4] ἐξαιρεῖν conj. Sch.; ἐξαίρειν Ald.H.

[5] So W. explains ἀλλὰ . . . πιττῆς. Or perhaps (as Sch.), 'however this is the interval which must elapse before the pitch can be worked again.'

ἐξαιρουμένης τῆς ῥᾳδὸς καὶ καιομένης τῆς πίττης ἡ ἐκροή. τοῦτο μὲν οὖν οὕτω ληπτέον.

7 Οἱ δὲ περὶ τὴν Ἴδην φασίν, ὅταν λεπίσωσι τὸ στέλεχος,—λεπίζουσι δὲ τὸ πρὸς ἥλιον μέρος ἐπὶ δύο ἢ τρεῖς πήχεις ἀπὸ τῆς γῆς—ἐνταῦθα τῆς ἐπιρροῆς γινομένης ἐνῥᾳδοῦσθαι ἐνιαυτῷ μάλιστα, τοῦτο δ' ὅταν ἐκπελεκήσωσιν ἐν ἑτέρῳ πάλιν ἐνῥᾳδοῦσθαι καὶ τὸ τρίτον ὡσαύτως, μετὰ δὲ ταῦτα διὰ τὴν ὑποτομὴν ἐκπίπτειν τὸ δένδρον ὑπὸ τῶν πνευμάτων σαπέν· τότε δ' ἐξαιρεῖν αὐτοῦ τὴν καρδίαν, τοῦτο γὰρ μάλιστα ῥᾳδῶδες, ἐξαιρεῖν δὲ ἐκ τῶν ῥιζῶν· καὶ γὰρ ταύτας, ὥσπερ εἴπομεν, ἐνῥᾴδους πασῶν.

8 Εἰκὸς δὲ δῆλον ὅτι τὰς μὲν ἀγαθάς, ὥσπερ ἐλέχθη, συνεχῶς τοῦτο δρᾶν τὰς δὲ χείρονας διὰ πλείονος χρόνου· καὶ ταμιευομένων μὲν πλείω χρόνον ἀντέχειν, ἐὰν δὲ πᾶσαν ἐξαιρῶσιν ἐλάττω· δύναται δ' ὡς ἔοικε τρεῖς μάλιστα τοιαύτας ἐξαιρέσεις ὑπομένειν. οὐχ ἅμα δὲ καρποφοροῦσιν αἱ πεῦκαι καὶ ῥᾳδοφοροῦσι· καρποφοροῦσι μὲν γὰρ εὐθὺς νέαι, ῥᾳδοφοροῦσι δὲ ὕστερον πολλῷ πρεσβύτεραι γινόμεναι.

III. Τὴν δὲ πίτταν καίουσι τόνδε τὸν τρόπον· ὅταν κατασκευάσωσιν ὁμαλῆ τόπον ὥσπερ ἅλω

[1] *i.e.* and so this kind of wood at least is replaced by fresh growth. [2] Plin. 16. 57.

[3] *τῆς ἐπιρροῆς γινομένης ἐνῥᾳδοῦσθαι* conj. W.; *τὴν ἐπιρροὴν γινομένην ἔνῥᾳδον* Ald.; *τῆς ἐπιρροῆς γινομένης ἔνῥᾳδον γίνεσθαι* conj. Sch.

removed [1] and burnt when the discharge of pitch takes place. So much for this account.

[2] The people of Mount Ida however say that, when they bark the stem,—and they bark the side towards the sun to a height of two or three cubits from the ground,—the flow of pitch takes place in that part,[3] and in about a year the wood becomes full of pitch; and that, when they have hewn this part out, pitch forms again in the next year, and in the third year in like manner; after which [4] that the tree, because it has been cut away underneath, is rotted by the winds and falls; and that then [5] they take out its heart, for that is especially full of pitch, and that they also extract pitch from [6] the roots; for that these too, as we said,[7] are full of pitch in all firs.

Now it is plainly to be expected that they should, as was said, repeatedly thus treat a good tree, but an inferior one at longer intervals, and that, if the tree is husbanded, the supply should hold out longer, while, if they remove all the pitch, it will not hold out so long; it appears as a matter of fact that the tree will stand about three such removals of its substance. [8] However firs do not produce both fruit and pitch at once; they begin to bear fruit when they are quite young, but they only produce pitch much later, when they are older.

Of the making of pitch in Macedonia and in Syria.

III. This is the manner in which they make pitch by fire:—having prepared a level piece of ground,

[4] μετὰ δὲ ταῦτα conj. Sch.; τὰ δὲ ταῦτα UM; τὰ δὲ τοιαῦτα Ald.

[5] τότε conj. Sch. from G; τοὺς Ald.

[6] ἐκ Ald.; καὶ conj. W.

[7] 9. 2. 3. [8] *cf. C.P.* 5. 16. 2.

ποιήσαντες ἔχουσαν εἰς τὸ μέσον συρροὴν καὶ ταύτην ἐδαφίσωσι,[1] κατασχίσαντες τοὺς κορμοὺς συντιθέασι παραπλησίαν σύνθεσιν τῆς τῶν ἀνθρακευόντων, πλὴν οὐκ ἔμβοθρον· ἀλλὰ τὰς σχίζας ὀρθὰς πρὸς ἀλλήλας, ὥστε λαμβάνειν ὕψος αἰεὶ κατὰ πλῆθος· γίνεσθαι δέ φασιν, ὅταν ἡ σύνθεσις ᾖ κύκλῳ μὲν ὀγδοήκοντα καὶ ἑκατὸν πηχέων εἰς ὕψος δὲ ἑξήκοντα πλεῖστον ἢ πεντήκοντα ἢ ἑκατὸν ἀμφοτέροις, ἐάνπερ ἡ δᾷς τυγχάνῃ
2 πίειρα. συνθέντες οὖν αὐτὴν οὕτως καὶ κατασκεπάσαντες ὕλῃ γῆν ἐπιβαλόντες κατακρύπτουσιν ὅπως μηδαμῶς διαλάμψῃ τὸ πῦρ, ἀπόλλυται γὰρ ἡ πίττα τούτου συμβάντος. ὑφάπτουσι δὲ κατὰ τὴν ὑπολειπομένην δίοδον· εἶτα δὲ καὶ ταῦτα ἐπιφράξαντες τῇ ὕλῃ καὶ ἐπιχώσαντες τηροῦσιν ἀναβαίνοντες κατὰ κλίμακος, ᾗ ἂν ὁρῶσι τὸν καπνὸν ὠθούμενον, καὶ ἐπιβάλλουσιν αἰεὶ τῆς γῆς ὅπως μηδ' ἀναλάμψῃ. κατεσκεύασται δὲ ὀχετὸς τῇ πίττῃ διὰ τῆς συνθέσεως τῆς ἀπορροῆς εἰς βόθυνον ὅσον ἀπέχοντα πεντεκαίδεκα πήχεις· ἡ δ' ἀπορρέουσα τῆς πίττης
3 ψυχρὰ γίνεται κατὰ τὴν ἀφήν. καίεται δὲ μάλιστα δύο ἡμέρας καὶ νύκτας· τῇ γὰρ ὑστεραίᾳ πρὸ ἡλίου δύναντος ἐκκεκαυμένη γίνεται καὶ ἐνδέδωκεν ἡ πυρά· τοῦτο γὰρ συμβαίνει μηκέτι ῥεούσης. τοῦτον δὲ τὸν χρόνον ἅπαντα τηροῦσιν

[1] ἐδαφίσωσι: *cf.* 9. 4. 4.

[2] *cf.* 5. 9, where however the 'pit' is not described.

[3] γίνεσθαι δὲ. Something seems to have dropped out at the beginning of this clause. ? "and they say that the pile at largest is 180" . . .: so Sch. supplying μεγίστη after ᾗ. The omitted words might also throw light on the preceding sentence.

which they make like a threshing-floor with a slope for the pitch to run towards the middle, and having made it smooth,[1] they cleave the logs and place them in an arrangement like that used by charcoal-burners,[2] except that there is no pit; but the billets are set upright against one another, so that the pile goes on growing in height according to the number used. And they say that the erection is complete,[3] when the pile is 180 cubits in circumference, and fifty, or at most sixty, in height; or again when it is a hundred cubits in circumference and a hundred in height,[4] if the wood happens to be rich in pitch. Having then thus arranged the pile and having covered it in with timber they throw on earth and completely cover it, so that the fire may not by any means show through; for, if this happens, the pitch is ruined. Then they kindle the pile where the passage is left, and then, having[5] filled that part[6] up too with the timber and piled on earth, they mount a ladder and watch wherever they see the smoke pushing its way out, and keep on piling on the earth, so that the fire may not even shew itself. And a conduit is prepared for the pitch right though the pile, so that it may flow into a hole about fifteen cubits off, and the pitch as it flows out is now cold to the touch. The pile burns for nearly two days and nights; for on the second day before sunset it has burnt itself out and the pile has fallen in; for this occurs if the pitch is no longer flowing. All this time[7] they keep watch and do not

[1] *ἀμφοτέροις*: *ἀμφοτέρωσε* conj. Sch.

[2] *ἐπιφράξαντες* conj. Scal. from G, *stipant*; *ἐπάξαντες* UM Ald.; *ἐπισάξαντες* H.

[3] *ταῦτα* Ald.; *ταύτην* W. after Sch.'s conj.

[4] *τοῦτον δέ τὸν χρόνον* conj. Sch. from G, *totum tempus*; *τόνδε δὲ τὸν τρόπον* UMAld.H.

ἀγρυπνοῦντες, ὅπως μὴ διαλάμπῃ, καὶ θύουσι δὲ καὶ ἑορτάζουσιν εὐχόμενοι πολλήν τε καὶ καλὴν γίνεσθαι τὴν πίτταν· οἱ μὲν δὴ περὶ Μακεδονίαν καίουσι τὸν τρόπον τοῦτον.

4 Ἐν δὲ τῇ Ἀσίᾳ φασὶ περὶ Συρίαν οὐκ ἐκπελεκῶντας[1] τὴν δᾷδα ἀλλ' ἐπ' αὐτῷ τῷ δένδρῳ προσκαίειν φέροντας ὄργανόν τι περιπεποιημένον[2] καὶ τούτῳ περιάπτοντας, εἶθ' ὅταν ἐκτήξωσι ταύτην πάλιν ἐπ' ἄλλο καὶ ἄλλο μεταφέρειν· ὅρος δέ ἐστιν αὐτοῖς τις καὶ σημεῖα τοῦ παύεσθαι καὶ μάλιστα δῆλον ὅτι τὸ μηκέτι ῥεῖν. πιττοκαυτοῦσι δέ, ὥσπερ καὶ πρότερον ἐλέχθη, τὰς τερμίνθους· πεύκην γὰρ οὐ φέρουσιν οἱ τόποι. τὰ μὲν οὖν περὶ τὴν ῥητίνην καὶ τὴν πίτταν οὕτως ἔχει.

IV. Περὶ δὲ λιβανωτοῦ καὶ σμύρνης καὶ βαλσάμου καὶ εἴ τι τοιοῦτον ἕτερον ὅτι μὲν καὶ ἀπ' ἐντομῆς γίνεται καὶ αὐτομάτως εἴρηται. ποία δε τις ἡ τῶν δένδρων φύσις καὶ εἴ τι περὶ τὴν γένεσιν ἢ τὴν συλλογὴν ἢ τῶν ἄλλων ἴδιον αὐτοῖς ὑπάρχει πειρατέον εἰπεῖν, ὡσαύτως δὲ καὶ περὶ τῶν λοιπῶν εὐόσμων· σχεδὸν γὰρ τά γε πλεῖστα ἀπὸ τῶν τόπων ἐστὶ τῶν τε πρὸς μεσημβρίαν καὶ ἀνατολήν.

2 Γίνεται μὲν οὖν ὁ λίβανος καὶ ἡ σμύρνα καὶ ἡ κασία καὶ ἔτι τὸ κινάμωμον ἐν τῇ τῶν Ἀράβων Χερρονήσῳ περί τε Σαβὰ καὶ Ἀδραμύτα καὶ

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[1] *ἐκπελεκῶντας* conj. W.; *ἐκπλέκοντες* U; *ἐκπλέοντες* M; *ἐκπλήττοντες* Ald.

[2] The sense given to *περιπεποιημένον* is unexampled, and the word may be corrupt.

go to rest, in case the fire should come through; and they offer sacrifice and keep holiday, praying that the pitch may be abundant and good. Such is the manner in which the people of Macedonia make pitch by fire.

They say that in Asia in the Syrian region they do not extract the pitch by cutting[1] out of the tree the wood containing it, but use fire to the tree itself, applying an instrument fashioned on purpose,[2] with which they set fire to it.[3] And then, when they have melted out the pitch at once place, they shift the instrument to another. But they have a limit and indications when to stop, chiefly of course the fact that the pitch ceases to flow. They also, as was said before,[4] use fire to get pitch out of the terebinth; for the places where this tree grows do not produce the fir. Such are the facts about resin and pitch.

Of frankincense and myrrh: various accounts.

IV. As to frankincense myrrh balsam of Mecca and similar plants it has been said that the gum is produced both by incision and naturally. Now we must endeavour to say what[5] is the natural character of these trees and to mention any peculiarities as to the origin of the gum or its collection or anything[6] else. So too concerning the other fragrant plants; most of these come from places in the south and east.

Now frankincense myrrh cassia and also cinnamon are found in the Arabian peninsula[7] about

[3] *τούτῳ περιάπτοντας* seems to have been G's reading (Scal.); *τοῦτο περιαλείφοντας* MSS. [4] 9. 2. 2.
[5] *ποία* conj. W.; *πολλὴ* Ald. [6] *τι* before *τῶν* add. Sch.
[7] *Χερρονήσῳ* conj. Salm.; *χώρᾳ νήσῳ* Ald. *cf.* Plin. 6. 28.

Κιτίβαινα καὶ Μαμάλι. φύεται δὲ τὰ τοῦ λιβανωτοῦ καὶ τῆς σμύρνης δένδρα τὰ μὲν ἐν τῷ ὄρει τὰ δ' ἐν ταῖς ἰδίαις γεωργίαις ὑπὸ τὴν ὑπώρειαν, δι' ὃ καὶ τὰ μὲν θεραπεύεται τὰ δ' οὔ· τὸ δ' ὄρος εἶναί φασιν ὑψηλὸν καὶ δασὺ καὶ νιφόμενον, ῥεῖν δ' ἐξ αὐτοῦ καὶ ποταμοὺς εἰς τὸ πέδιον. εἶναι δὲ τὸ μὲν τοῦ λιβανωτοῦ δένδρον οὐ μέγα, πεντάπηχυ δέ τι καὶ πολύκλαδον, φύλλον δ' ἔχειν ἐμφερὲς τῇ ἀπίῳ, πλὴν ἔλαττον πολὺ καὶ τῷ χρώματι ποῶδες σφόδρα, καθάπερ τὸ πήγανον· λειόφλοιον δὲ πᾶν, ὥσπερ τὴν δάφνην.

3 Τὴν δὲ σμύρναν ἔλαττον ἔτι τῷ μεγέθει καὶ θαμνωδέστερον δέ, τὸ δὲ στέλεχος ἔχειν σκληρὸν καὶ συνεστραμμένον ἐπὶ τῆς γῆς, παχύτερον δὲ ἢ κνημοπαχές· φλοιὸν δὲ ἔχειν λεῖον ὅμοιον τῇ ἀνδράχλῃ. ἕτεροι δὲ οἱ φάσκοντες τεθεωρηκέναι περὶ μὲν τοῦ μεγέθους σχεδὸν συμφωνοῦσιν· οὐδέτερον γὰρ εἶναι μέγα τῶν δένδρων, ἔλαττον δὲ τὸ τῆς σμύρνης καὶ ταπεινότερον· φύλλον δὲ ἔχειν τὸ τοῦ λιβανωτοῦ δαφνοειδὲς καὶ λειόφλοιον δ' εἶναι· τὸ δὲ τῆς σμύρνης ἀκανθῶδες καὶ οὐ λεῖον, φύλλον δὲ προσεμφερὲς ἔχειν τῇ πτελέᾳ, πλὴν οὖλον ἐξ ἄκρου δὲ ἐπακανθίζον, ὥσπερ τὸ τῆς πρίνου.

4 Ἔφασαν δὲ οὗτοι κατὰ τὸν παράπλουν ὃν ἐξ Ἡρώων ἐποιοῦντο κόλπου ζητεῖν ἐκβάντες ὕδωρ ἐν τῷ ὄρει καὶ οὕτω θεωρῆσαι τὰ δένδρα καὶ τὴν συλλογήν. εἶναι δ' ἀμφοτέρων ἐντετμημένα καὶ

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[1] Plin. 12. 55 and 56. [2] Plin. 12. 67.

[3] ἔχειν conj. Sch.; ἔχει P_2Ald.

[4] λιβανωτοῦ δαφνοειδὲς καὶ λειόφλοιον δ' εἶναι conj. Sch.; λιβάνου τοῦ δαφνοειδὲς καὶ λειόφυλλον δ' εἶναι UM; λιβάνου δαφνοειδὲς

Saba Hadramyta Kitibaina and Mamali. The trees of frankincense and myrrh grow partly in the mountains, partly on private estates at the foot of the mountains; wherefore some are under cultivation, others not; the mountains, they say, are lofty, forest-covered and subject to snow, and rivers from them flow down to the plain. The frankincense-tree,[1] it is said, is not tall, about five cubits high, and it is much branched; it has a leaf like that of the pear, but much smaller and very grassy in colour, like rue; the bark is altogether smooth like that of bay.

The myrrh-tree[2] is said to be still smaller in stature and more bushy; it is said to have[3] a tough stem, which is contorted near the ground, and is stouter than a man's leg; and to have a smooth bark like that of andrachne. Others who say that they have seen it agree pretty closely about the size; neither of these trees, they say, is large, but that which bears myrrh is the smaller and of lower growth; however they say that, while the frankincense-tree[4] has a leaf like that of bay and smooth bark, that which bears myrrh is spinous and not smooth, and has a leaf like that of the elm, except that it is curly and spinous[5] at the tip like that of kermes-oak.

[6] These said that on the coasting voyage which they made from the bay of the Heroes they landed to look for water on the mountains and so saw these trees and the manner of collecting their gums. [7] They reported that with both trees incisions had

καὶ λειόφλοιον δ' εἶναι P_2; λιβάνου· ἀλλὰ τοῦ μὲν δαφνοειδὲς καὶ λειόφυλλον εἶναι Ald. H. *cf.* Plin. 12. 57.

[5] *cf.* 3. 10. 1; 3. 11. 3.

[6] *cf.* Arr. *Anab.* 3. 5. 4; 7. 20. 1 and 2.

[7] Plin. 12. 58–62.

τὰ στελέχη καὶ τοὺς κλάδους, ἀλλὰ τὰ μὲν ὥσπερ ἀξίνῃ δοκεῖν τετμῆσθαι τοὺς δὲ λεπτοτέρας ἔχειν τὰς ἐντομάς· τὸ δὲ δάκρυον τὸ μὲν καταπίπτειν τὸ δὲ καὶ πρὸς τῷ δένδρῳ προσέχεσθαι. ἐνιαχοῦ μὲν ὑποβεβλῆσθαι ψιάθους ἐκ φοινίκων πεπλεγμένας, ἐνιαχοῦ δὲ τὸ ἔδαφος μόνον ἠδαφίσθαι καὶ καθαρὸν εἶναι· καὶ τὸν μὲν ἐπὶ τῶν ψιάθων λιβανωτὸν εἶναι καὶ καθαρὸν καὶ διαφανῆ, τὸν δ' ἐπὶ τῆς γῆς ἧττον· τὸν δ' ἐπὶ τοῖς δένδροις προσεχόμενον ἀποξύειν σιδήροις, δι' ὃ καὶ φλοιὸν ἐνίοις
5 προσεῖναι. τὸ δὲ ὄρος ἅπαν μεμερίσθαι τοῖς Σαβαίοις, τούτους γὰρ εἶναι κυρίους, δικαίους δὲ τὰ πρὸς ἀλλήλους, δι' ὃ καὶ οὐδένα τηρεῖν· ὅθεν καὶ αὐτοὶ δαψιλῶς εἰς τὰ πλοῖα λαβόντες ἐνθέσθαι τοῦ λιβανωτοῦ καὶ τῆς σμύρνης ἐρημίας οὔσης καὶ ἀποπλεῖν. ἔλεγον δ' οὗτοι καὶ τόδε καὶ ἔφασαν ἀκούειν, ὅτι συνάγεται πανταχόθεν ἡ σμύρνα καὶ ὁ λιβανωτὸς εἰς τὸ ἱερὸν τὸ τοῦ ἡλίου· τοῦτο δ' εἶναι μὲν τῶν Σαβαίων ἁγιώτατον δὲ πολὺ τῶν περὶ τὸν τόπον, τηρεῖν δέ τινας Ἄραβας ἐνόπλους· ὅταν δὲ κομίσωσιν, ἕκαστον σωρεύ-
6 σαντα τὸν αὑτοῦ καὶ τὴν σμύρναν ὁμοίως καταλιπεῖν τοῖς ἐπὶ τῆς φυλακῆς, τιθέναι δὲ ἐπὶ τοῦ σωροῦ πινάκιον γραφὴν ἔχον τοῦ τε πλήθους τῶν μέτρων καὶ τῆς τιμῆς ἧς δεῖ πραθῆναι τὸ μέτρον ἕκαστον· ὅταν δὲ οἱ ἔμποροι παραγένωνται, σκοπεῖν τὰς γραφάς, ὅστις δ' ἂν αὐτοῖς ἀρέσκῃ

[1] πραθῆναι conj. Sch. from G; πρασθῆναι U; προσθεῖναι P_2 Ald.

been made both in the stems and in the branches, but that, while the stems looked as if they had been cut with an axe, in the branches the incisions were slighter; also that in some cases the gum was dropping, but that in others it remained sticking to the tree; and that in some places mats woven of palm-leaves were put underneath, while in some the ground underneath was merely made level and clean; and that the frankincense on the mats was clear and transparent, that collected on the ground less so; and that that which remained sticking to the trees they scraped off with iron tools, wherefore sometimes pieces of bark remained in it. The whole range, they said, belongs to the portion of the Sabaeans; for it is under their sway, and they are honest in their dealings with one another. Wherefore no one keeps watch; so that these sailors greedily took, they said, and put on board their ships some of the frankincense and myrrh, since there was no one about, and sailed away. They also reported another thing which they said they had been told, that the myrrh and frankincense are collected from all parts into the temple of the sun; and that this temple is the most sacred thing which the Sabaeans of that region possess, and it is guarded by certain Arabians in arms. And that when they have brought it, each man piles up his own contribution of frankincense and the myrrh in like manner, and leaves it with those on guard; and on the pile he puts a tablet on which is stated the number of measures which it contains, and the price for which each measure should be sold [1]; and that, when the merchants come, they look at the tablets, and whichsoever pile pleases them, they

μετρησαμένους τιθέναι τὴν τιμὴν εἰς τοῦτο τὸ χωρίον ἔνθεν ἂν ἕλωνται, καὶ τὸν ἱερέα παραγενόμενον τὸ τρίτον μέρος λαβόντα τῆς τιμῆς τῷ θεῷ τὸ λοιπὸν αὐτοῦ καταλιπεῖν καὶ τοῦτο σῶν εἶναι τοῖς κυρίοις, ἕως ἂν ἕλωνται παραγενόμενοι.

7 Ἄλλοι δέ τινες τὸ μὲν τοῦ λιβανωτοῦ δένδρον ὅμοιον εἶναί φασι σχίνῳ καὶ τὸν καρπὸν ταῖς σχινίσι φύλλον δὲ ὑπέρυθρον· εἶναι δὲ τὸν μὲν ἐκ τῶν νέων λιβανωτὸν λευκότερον καὶ ἀοδμότερον, τὸν δ' ἐκ τῶν παρηκμακότων ξανθότερον καὶ εὐοσμότερον· τὸ δὲ τῆς σμύρνης ὅμοιον τῇ τερμίνθῳ, τραχύτερον δ καὶ ἀκανθωδέστερον, φύλλον δὲ μικρῷ στρογγυλότερον, τῇ δὲ γεύσει διαμασωμένοις ὅμοιον τῷ τῆς τερμίνθου· εἶναι δὲ καὶ τούτων τὰ παρηκμακότα εὐοσμότερα.

8 Γίνεσθαι δὲ ἀμφότερα ἐν τῷ αὐτῷ τόπῳ· τὴν δὲ γῆν ὑπάργιλον καὶ πλακώδη, καὶ ὕδατα πηγαῖα σπάνια. ταῦτα μὲν οὖν ὑπεναντία τῷ νίφεσθαι καὶ ὕεσθαι καὶ ποταμοὺς ἐξιέναι· τὸ δὲ παρόμοιον εἶναι τὸ δένδρον τῇ τερμίνθῳ καὶ ἄλλοι τινὲς λέγουσιν, οἱ δὲ καὶ ὅλως τέρμινθον εἶναι· κομισθῆναι γὰρ ξύλα πρὸς Ἀντίγονον ὑπὸ τῶν Ἀράβων τῶν τὸν λιβανωτὸν καταγόντων, ἃ οὐδὲν διέφερε τῶν τῆς τερμίνθου· πλὴν οὗτοί γε μεῖζον

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[1] Plin. 12. 66 and 67. [2] Plin. 12. 53.

[3] πλακώδη: lit. 'with a crust'; so W., but the word does not seem to occur elsewhere in this sense.

[4] *cf.* 9. 4. 2.

measure, and put down the price on the spot whence they have taken the wares, and then the priest comes and, having taken the third part of the price for the god, leaves the rest of it where it was, and this remains safe for the owners until they come and claim it.

Others report that the tree which produces the frankincense is like mastich, and its fruit is like the fruit of that tree, but the leaf is reddish: also that the frankincense derived from young trees is whiter and less fragrant, while that derived from those which have passed their prime is yellower and more fragrant; also that the tree which produces myrrh is like the terebinth, but rougher and more thorny; that the leaf is somewhat rounder, and that, if one chews it, it resembles that of the terebinth in taste; also that of myrrh-trees too those that are past their prime give more fragrant myrrh.

[1] Both trees, it is said, grow in the same region; the soil is clayey [2] and caked,[3] and spring waters are scarce. Now these reports are contradictory to [4] that which says that the country is subject to snow and rain and sends forth rivers. However others make the statement [5] that the tree is like the terebinth; in fact some say that it is the same tree; for that logs of it were brought to Antigonus by the Arabs who brought the frankincense down to the sea, and that these did not differ at all from logs of terebinth.[6] However these informants were guilty

[5] *i.e.* the statement quoted of the myrrh-tree, § 7. The 'tree' is here the λιβανωτός, but these authorities did not distinguish it from the myrrh-tree. See below.

[6] τῶν conj. Sch.; τῷ UAld.

ἕτερον ἀγνόημα προσηγνόουν· ᾠοντο γὰρ ἐκ τοῦ αὐτοῦ δένδρου τόν τε λιβανωτὸν γίνεσθαι καὶ τὴν
9 σμύρναν· διόπερ ἐκεῖνος ὁ λόγος πιθανώτερος ὁ παρὰ τῶν ἀναπλευσάντων ἐξ Ἡρώων πόλεως· ἐπεὶ καὶ τὸ ὑπὲρ Σάρδεων πεφυκὸς τοῦ λιβανωτοῦ δένδρον ἐν ἱερῷ τινι δαφνοειδὲς ἔχει τὸ φύλλον, εἴ τι δεῖ σταθμᾶσθαι τοῦτο· ὁ λιβανωτὸς δ' ἔχει, καὶ ὁ ἐκ τοῦ στελέχους καὶ ὁ ἐκ τῶν ἀκρεμόνων, ὁμοίως καὶ τῇ ὄψει καὶ τῇ ὀσμῇ θυμιώμενος τῷ ἄλλῳ λιβανωτῷ. πέφυκε δὲ τοῦτο μόνον τὸ δένδρον οὐδεμιᾶς τυγχάνειν <θεραπείας>.

10 Ἔνιοι δὲ λέγουσιν ὡς πλείων μὲν ὁ λιβανωτὸς ἐν τῇ Ἀραβίᾳ γίνεται, καλλίων δὲ ἐν ταῖς ἐπικειμέναις νήσοις ὧν ἐπάρχουσιν· ἐνταῦθα γὰρ καὶ σχηματοποιεῖν ἐπὶ τῶν δένδρων οἷον ἂν θέλωσι· καὶ τάχα τοῦτό γε οὐκ ἀπίθανον· ἐνδέχεται <γὰρ> ὁποίαν ἂν βούλωνται ποιεῖν τὴν ἐντομήν. εἰσὶ δέ τινες καὶ μεγάλοι σφόδρα τῶν χόνδρων, ὥστ' εἶναι τῷ μὲν ὄγκῳ χειροπληθιαίους σταθμῷ δὲ πλέον ἢ τρίτον μέρος μνᾶς. ἀργὸς δὲ κομίζεται πᾶς ὁ λιβανωτός, ὅμοιος δὲ τῇ προσόψει φλοιῷ. τῆς σμύρνης δὲ ἡ μὲν στακτὴ ἡ δὲ πλαστή. δοκιμάζεται δ' ἡ μὲν ἀμείνων τῇ γεύσει, καὶ ἀπὸ ταύτης τὴν ὁμόχρων λαμβάνουσι. . περὶ μὲν οὖν λιβανωτοῦ καὶ σμύρνης σχεδὸν τοσαῦτα ἀκηκόαμεν ἄχρι γε τοῦ νῦν.

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[1] Plin. 15. 57 ; *cf.* 16. 135.

[2] δ' ἔχει conj. W.; *δίεται* P_2Ald.; om. H.

[3] *θεραπείας* add. Sch. from G ; *οὐδεμιᾶς τυγχάνειν* UMAld.; *οὐ μιᾶς τυγχάνειν* P_2. But there is no sign of a lacuna in the MSS., and *οὐδεμίας* is probably corrupt, as W. suggests. *οὐδε θερ.* is inconsistent with 9. 4. 2.

[4] *πλείων* conj. W.; *ἡδίων* P_2Ald.

of a further more important piece of ignorance; for they believed that the frankincense and the myrrh were produced by the same tree. Wherefore the account derived from those who sailed from the city of Heroes is more to be believed; [1] in fact the frankincense-tree which grows above Sardes in a certain sacred precinct has [2] a leaf like that of bay, if we may judge at all by this; and the frankincense derived both from its stem and its branches is like in appearance and in smell, when it is burnt as incense, to other frankincense. This is the only tree which can never be cultivated.[3]

Some say that the frankincense-tree is more abundant [4] in Arabia, but finer in the adjacent islands [5] over which the Arabians bear rule; [6] for there it is said that they mould the gum on the trees to any shape that they please. And perhaps this is not incredible, since it is possible to make any kind of incision that they like. Some of the lumps [7] of gum are very large, so that one is large enough in bulk to fill the hand and in weight is more than a third of a pound. All frankincense is gathered in the rough and is like bark in appearance. Myrrh [8] is either 'fluid' [9] (myrrh-oil) or 'solid' (agglutinated). That of better quality is tested by its taste, and of this they select that which is of uniform colour.[10] Now of frankincense and myrrh these are about all the facts that have come to our notice at present.

[5] Plin. 12. 60.
[6] *ἐπάρχουσιν* conj. Coraës; *ἐνυπάρχουσι* P_2Ald.
[7] *τῶν χόνδρων* conj. Sch.: *τῷ χόνδρῳ* P_2Ald.
[8] *i.e.* here the commodity so called.
[9] *cf. Odor.* 29.
[10] *δμόχρων* conj. Sch.; *δμόχρω* UM; *δμόχρουν* Ald.; *τὴν ἑτέραν καταλαμβάνουσι* P_2.

V. Περὶ δὲ κιναμώμου καὶ κασίας τάδε λέγουσι· θάμνους μὲν ἀμφότερα ταῦτ' εἶναι οὐ μεγάλους ἀλλ' ἡλίκους ἄγνου, πολυκλάδους δὲ καὶ ξυλώδεις. ὅταν δὲ ἐκκόψωσιν, ὅλον τὸ κινάμωμον διαιρεῖν εἰς πέντε μέρη· τούτων δὲ τὸ πρῶτον πρὸς τοῖς βλαστοῖς βέλτιστον εἶναι, ὃ τεμνεται σπιθαμιαῖον ἢ μικρῷ μεῖζον· ἑπόμενον δὲ τὸ δεύτερον, ὃ καὶ τῇ τομῇ ἔλαττον· εἶτα τὸ τρίτον καὶ τέταρτον· ἔσχατον δὲ τὸ χείριστον τὸ πρὸς τῇ ῥίζῃ· φλοιὸν γὰρ ἐλάχιστον ἔχειν· χρήσιμος δὲ οὗτος, οὐ τὸ ξύλον· δι' ὃ καὶ τὸ ἀκροφυὲς κράτιστον, πλεῖστον γὰρ ἔχειν καὶ τὸν φλοιόν. οἱ μὲν οὕτω λέγουσιν.

2 Ἄλλοι δὲ θαμνῶδες μὲν καὶ ἔτι μᾶλλον φρυγανῶδες εἶναί φασι· δύο δ' αὐτοῦ γένη, τὸ μὲν μέλαν τὸ δὲ λευκόν. λέγεται δέ τις καὶ μῦθος ὑπὲρ αὐτοῦ· φύεσθαι μὲν γάρ φασιν ἐν φάραγξιν, ἐν ταύταις δ' ὄφεις εἶναι πολλοὺς δῆγμα θανάσιμον ἔχοντας, πρὸς οὓς φραξάμενοι τὰς χεῖρας καὶ τοὺς πόδας καταβαίνουσι καὶ συλλέγουσιν, εἶθ' ὅταν ἐξενέγκωσι διελόντες τρία μέρη διακληροῦνται πρὸς τὸν ἥλιον, καὶ ἣν ἂν λάχῃ ὁ ἥλιος καταλείπουσιν· ἀπιόντες δ' εὐθὺς ὁρᾶν φασι καιομένην ταύτην· οὗτος μὲν οὖν τῷ ὄντι μῦθος.

3 Τὴν δὲ κασίαν φασὶ τὰς μὲν ῥάβδους παχυτέρας ἔχειν, ἰνώδεις δὲ σφόδρα καὶ οὐκ εἶναι περιφλεῦσαι· χρήσιμον δὲ καὶ ταύτης τὸν φλοιόν.

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[1] Plin. 12. 85–94.

[2] A similar tale is told of frankincense by Herodotus (3. 107), who has an equally surprising tale about cinnamon (3. 111).

Of cinnamon and cassia: various accounts.

V. [1] Of cinnamon and cassia the following account is given: both are shrubs, it is said, and not of large size, but of the same size as bushes of chaste-tree, with many branches and woody. When they cut down the whole cinnamon-tree, they divide it into five parts; of these the first is that which grows next the branches and this is the best: this is cut in lengths a span long or a little longer; next comes the second kind, which is cut in shorter lengths; then come the third and the fourth, and last the least valuable wood, which grows next the root; for this has least bark, and it is the bark and not the wood which is serviceable; wherefore the part which grows high up the tree is the best, since it has the most bark. Such is the account given by some.

Others say that cinnamon is shrubby or rather like an under-shrub; and that there are two kinds, one black, the other white. [2] And there is also a tale told about it; they say that it grows in deep glens, and that in these there are numerous snakes which have a deadly bite; against these they protect their hands and feet before they go down into the glens, and then, when they have brought up the cinnamon, they divide it in three parts and draw lots for it with the sun; and whatever portion falls to the lot of the sun they leave behind; and they say that, as soon as they leave the spot, they see this take fire. Now this is sheer fable.

[3] Cassia, they say, has stouter branches, which are very fibrous and difficult to strip of the bark[4]; and it is the bark of this tree also which is serviceable.

[3] Plin. 12. 95–97.

[4] περιφλοῖσαι H.; περιφλεῦσαι UMP_2Ald. *cf. de igne* 72.

ὅταν οὖν τέμνωσι τὰς ῥάβδους, κατακόπτειν ὡς διδάκτυλα· τὸ μῆκος ἢ μικρῷ μείζω, ταῦτα δ' εἰς νεόδορον βύρσαν καταρράπτειν· εἶτ' ἐκ ταύτης καὶ τῶν ξύλων σηπομένων σκωλήκια γίνεσθαι, ἃ τὸ μὲν ξύλον κατεσθίει, τοῦ φλοιοῦ δ' οὐχ ἅπτεται διὰ τὴν πικρότητα καὶ δριμύτητα τῆς ὀσμῆς. καὶ περὶ μὲν κασίας καὶ κιναμώμου τοσαῦτα λέγεται.

VI. Τὸ δὲ βάλσαμον γίνεται μὲν ἐν τῷ αὐλῶνι τῷ περὶ Συρίαν. παραδείσους δ' εἶναί φασι δύο μόνους, τὸν μὲν ὅσον εἴκοσι πλέθρων τὸν δ' ἕτερον πολλῷ ἐλάττονα. τὸ δὲ δένδρον μέγεθος μὲν ἡλίκον ῥόα μεγάλη πολύκλαδον δὲ σφόδρα· φύλλον δὲ ἔχειν ὅμοιον πηγάνῳ, πλὴν ἔκλευκον, ἀείφυλλον δὲ εἶναι· καρπὸν δὲ παρόμοιον τῇ τερμίνθῳ καὶ μεγέθει καὶ σχήματι καὶ χρώματι· εὐῶδες σφόδρα καὶ τοῦτο καὶ μᾶλλον τοῦ δακρύου.

2 Τὸ δὲ δάκρυον ἀπὸ ἐντομῆς συλλέγειν, ἐντέμνειν δὲ ὄνυξι σιδηροῖς ὑπὸ τὸ ἄστρον, ὅταν μάλιστα πνίγη ὦσι, καὶ τὰ στελέχη καὶ τὰ ἄνω. τὴν δὲ συλλογὴν ὅλον τὸ θέρος ποιεῖσθαι· οὐκ εἶναι δὲ πολὺ τὸ ῥέον, ἀλλ' ἐν ἡμέρᾳ τὸν ἄνδρα συλλέγειν ὅσον κόγχην· τὴν δ' ὀσμὴν διαφέρουσαν καὶ πολλήν, ὥστε ἀπὸ μικροῦ πολὺν ἐφικνεῖσθαι τόπον. ἀλλ' οὐ φοιτᾶν ἐνταῦθα ἄκρατον ἀλλὰ τὸ συνηγμένον κεκραμένον· πολλὴν γὰρ δέχεσθαι

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[1] *νεόδορον* conj. Sch.; *νεόδερον* P_2Ald. [2] Plin. 12 111–123. [3] *εὐῶδες . . . τοῦτο* P_2Ald.; *εὐώδη . . . τοῦτον* W. after Sch.'s conj. But the clause begins without a conjunction, and some

When then they cut off the branches, they chop them up into lengths of about two fingers' breadth or rather more, and these they sew up in raw [1] hide; and then from the leather and the decaying wood little worms are engendered, which devour the wood but do not touch the bark, because it is bitter and has a pungent odour. This is all the information forthcoming about cinnamon and cassia.

Of balsam of Mecca.

VI. [2] Balsam of Mecca grows in the valley of Syria. They say that there are only two parks in which it grows, one of about four acres, the other much smaller. The tree is as tall as a good-sized pomegranate and is much branched; it has a leaf like that of rue, but it is pale; and it is evergreen; the fruit is like that of the terebinth in size shape and colour, and this too is very fragrant,[3] indeed more so than the gum.

[4] The gum, they say, is collected by making incisions, which is done with bent pieces of iron at the time of the Dog-star, when there is scorching heat; and the incisions are made both in the trunks and in the upper parts of the tree. The collecting goes on throughout the summer; but the quantity which flows is not large; in a day a single man can collect a shell-full [5]; the fragrance is exceeding great and rich, so that that which comes from a small amount is perceived for a wide distance. However it does not reach us in a pure state; what is collected is mixed with other things; for it mixes freely with

words about the *flower* may have dropped out, to which this clause refers; *cf.* however *Odor.* 32.

[4] Diosc. 1. 19. [5] Plin. 12. 117.

κρᾶσιν· καὶ τὸ ἐν τῇ Ἑλλάδι πολλάκις εἶναι κεκραμένον· εὔοσμα δὲ σφόδρα καὶ τὰ ῥαβδία·
3 καθαίρειν γὰρ καὶ τῶνδε ἕνεκα καί του διαφόρου· πωλεῖσθαι <γὰρ> τίμια. καὶ τὴν ἐργασίαν τὴν περὶ τὰ δένδρα σχεδὸν ἐν ταὐτῇ αἰτίᾳ εἶναι καὶ τὴν βροχήν· βρέχεσθαι γὰρ συνεχῶς. συναιτίαν δὲ δοκεῖν εἶναι τοῦ μὴ μεγάλα γίνεσθαι τὰ δένδρα καὶ τὴν τῶν ῥαβδίων τομήν. διὰ γὰρ τὸ πολλάκις ἐπικείρεσθαι ῥάβδους ἀφιέναι καὶ οὐκ εἰς ἓν ἐκτείνειν τὴν ὁρμήν.

4 Ἄγριον δὲ οὐδὲν εἶναι βάλσαμον οὐδαμοῦ· γίνεσθαι δὲ ἐκ μὲν τοῦ μείζονος παραδείσου ἀγγεῖδια δώδεκα ὅσον ἡμιχοαῖα, ἐκ δὲ τοῦ ἑτέρου δύο μόνον· πωλεῖσθαι δὲ τὸ μὲν ἄκρατον δὶς πρὸς ἀργύριον τὸ δ' ἄλλο κατὰ λόγον τῆς μίξεως· καὶ τοῦτο μὲν διαφέρον τι φαίνεται κατὰ τὴν εὐοσμίαν.

VII. Ὁ δὲ κάλαμος γίνεται καὶ ὁ σχοῖνος ὑπερβάλλοντι τὸν Λίβανον μεταξὺ τοῦ τε Λιβάνου καὶ ἄλλου τινὸς ὄρους μικροῦ ἐν τῷ αὐλωνίσκῳ τούτῳ, καὶ οὐχ ὥς τινές φασι τοῦ Ἀντιλιβάνου· ὁ γὰρ Ἀντιλίβανος μακρὰν ἀπέχει τοῦ Λιβάνου καὶ μεταξὺ τούτων ἐστὶν ὃν αὐλῶνα καλοῦσι πεδίον πολὺ καὶ καλόν. ὅπου δὲ ὁ κάλαμος καὶ ὁ σχοῖνος φύεται λίμνη μεγάλη τυγχάνει, πρὸς ταύτην δὲ ἐν τῷ ἕλει τῷ ἀνεξηραμμένῳ πεφύκασι·

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[1] *του* I conj. ; *τοῦ* MSS. G's rendering shews that the explanation of the 'different reason' (*i.e.* to strengthen the tree) has dropped out of our texts. [2] *γὰρ* add. Sch.

other things; and what is known in Hellas is generally mixed with something else. The boughs are also very fragrant. In fact it is on account of these boughs, they say, that the tree is pruned (as well as for a different reason[1]), since[2] the boughs cut off can be sold for a good price. In fact the culture of the trees has the same motive[3] as the irrigation (for they are constantly irrigated). And the cutting of the boughs seems likewise to be partly the reason why the trees do not grow tall; for, since they are often cut about, they send out branches instead of putting out all their energy in one direction.

Balsam is said not to grow wild anywhere. From the larger park are obtained twelve vessels containing each about three pints, from the other only two such vessels; the pure gum sells for twice its weight in silver, the mixed sort at a price proportionate to its purity. Balsam then appears to be of exceptional fragrance.

Of other aromatic plants—all oriental, except the iris.

VII. [4] Sweet-flag and ginger-grass grow beyond the Libanus between that range and another small range, in the depression thus formed; and not, as some say, between Libanus and Anti-Libanus. For Anti-Libanus is a long way from Libanus, and between them is a wide fair plain called 'The Valley.' But, where the sweet-flag and ginger-grass grow, there is a large lake,[5] and they grow near it in the dried up marshes, covering an extent

[3] The 'motive' is the production of boughs. *ἐν ταὐτῇ αἰτίᾳ* I conj.; *ταύτην αἰτίαν* UMP$_2$Ald.; *ἐν ταύτῃ αἰτίᾳ* conj. W.
[4] Plin. 12. 104 and 105. [5] *cf. C.P.* 6. 18. 2.

τοπον δὲ ἔχουσι πλεῖον ἢ τριάκοντα σταδίων. οὐκ ὄζουσι δὲ χλωροὶ ἀλλὰ ξηρανθέντες, τῇ προσόψει δὲ οὐδὲν διαφέρουσι τῶν ἄλλων· εἰσβάλλοντι δ' εἰς τὸν τόπον εὐθὺς ὀσμὴ προσ-
2 βάλλει· οὐ μὴν πορρωτέρω γε ἡ ἀποπνοὴ γίνεται, καθάπερ τινές φασι, ταῖς προσφερομέναις ναυσὶ πρὸς τὴν χώραν· καὶ γὰρ ὁ τόπος οὗτος ἀπὸ θαλάττης ἀπέχει πλείους ἢ ἑκατὸν πεντήκοντα σταδίους· ἀλλ' ἐν τῇ Ἀραβίᾳ τὴν ἀποπνοὴν εἶναί φασι τὴν ἀπὸ τῆς χώρας εὔοσμον.

Ἐν μὲν οὖν Συρίᾳ τὰ περιττὰ τῇ ὀσμῇ σχεδὸν ταῦτ' ἐστίν· ἡ γὰρ χαλβάνη βαρύτερον καὶ μᾶλλον φαρμακῶδες· ἐπεὶ καὶ αὕτη γίνεται περὶ Συρίαν ἐκ τοῦ πανάκους καλουμένου. τὰ δὲ ἄλλα πάντα τὰ εὔοσμα οἷς πρὸς τὰ ἀρώματα χρῶνται, τὰ μὲν ἐξ Ἰνδῶν κομίζεται κἀκεῖθεν ἐπὶ θάλατταν καταπέμπεται, τὰ δ' ἐξ Ἀραβίας, οἷον πρὸς τῷ κιναμώμῳ καὶ τῇ κασίᾳ καὶ κώμακον· ἕτερον δ' εἶναι τὸ κώμακον καρπόν· τὸ δ' ἕτερον παραμίσγουσιν εἰς τὰ σπουδαιότατα τῶν μύρων. τὸ δὲ καρδάμωμον καὶ ἄμωμον οἱ μὲν ἐκ Μηδείας, οἱ δ' ἐξ Ἰνδῶν καὶ ταῦτα καὶ τὴν νάρδον καὶ τὰ ἄλλα ἢ τὰ πλεῖστα.

3 Οἷς μὲν οὖν εἰς τὰ ἀρώματα χρῶνται σχεδὸν τάδε ἐστί· κασία κινάμωμον καρδάμωμον νάρδος ναῖρον βάλσαμον ἀσπάλαθος στύραξ ἶρις νάρτη

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[1] οὐκ ὄζουσι conj. Guilandinus, *cf. C.P.* 6. 14. 8; οὐ δοκοῦσι P_2Ald.H.

[2] *cf. C.P.* 6. 18. 1. τῶν ἄλλων: sc. καλάμων καὶ σχοίνων.

[3] προσφερομέναις ναυσὶ πρὸς conj. Scal.; προσφ. εἶναι πρὸς P_2 Ald.

[4] *cf.* 9. 9. 2 n. 'The plant,' *i.e. one* of the plants so called.

[5] Plin. 12. 135; *cf.* 13. 18.

of more than thirty furlongs. They have no fragrance[1] when they are green, but only when they are dried, and in appearance they do not differ[2] from ordinary reeds and rushes; but, as you approach the spot, immediately a sweet smell strikes you. However it is not true, as some say, that the fragrance is wafted to ships approaching[3] the country; for indeed this district is more than 150 furlongs from the sea. However it is said that in Arabia the breezes wafted from the land are fragrant.

Such then are the plants in Syria which have remarkable fragrance. For that of *khalbane* is more oppressive and somewhat medicinal; [4]for this perfume also is produced in Syria from the plant called all-heal. As to all the other fragrant plants used for aromatic odours, they come partly from India whence they are sent over sea, and partly from Arabia, for instance, *komakon*[5]—as well as cinnamon and cassia. The *fruit* called *komakon* is said to be distinct[6] from this; the *komakon* of which we are speaking is a perfume which they mix with the choicest unguents. Cardamom and Nepaul cardamom some say come from Media; others say that these come from India, as well as spikenard and most, if not all, of the other species.

Now this is a general list of the plants used for perfumes:—cassia cinnamon cardamom spikenard *nairon* balsam of Mecca *aspalathos* storax iris *narte*

[6] εἶναι has no government, and W. considers the passage corrupt. Comparison of Plin. *l.c.* suggests that the original text may have been something like this: τὸ κώμακον καρπὸν ὄν· τὸν δὲ χυλὸν κ.τ.λ., *i.e.* '*komakon* is of different character from these, being a fruit, whose juice—.' Plin. calls κ, a kind of cinnamon.

κόστος πάνακες κρόκος σμύρνα κύπειρον σχοῖνος κάλαμος ἀμάρακον λωτὸς ἄννητος. τούτων δὲ τὰ μὲν ῥίζαι τὰ δὲ φλοιοὶ τὰ δὲ κλῶνες τὰ δὲ ξύλα τὰ δὲ σπέρματα τὰ δὲ δάκρυα τὰ δὲ ἄνθη. καὶ τὰ μὲν πολλαχοῦ γίνεται, τὰ δὲ περιττότατα καὶ εὐοδμότατα πάντα ἐκ τῆς Ἀσίας καὶ ἐκ τῶν ἀλεεινῶν τόπων. ἐκ γὰρ αὐτῆς Εὐρώπης οὐδέν ἐστιν ἔξω τῆς ἴριδος.

4 Αὕτη δ' ἀρίστη ἐν Ἰλλυριοῖς, οὐκ ἐν τῇ πρὸς θάλατταν χώρᾳ, ἀλλ' ἐν τῇ ἀνακεχωρηκυίᾳ κειμένῃ δὲ μᾶλλον πρὸς ἄρκτον. τόποι δὲ τόπων διαφέρουσιν ἐν οἷς ἀμείνων· ἐργασία δὲ περὶ αὐτὴν οὐδεμία πλὴν τοῦ περικαθήραντα ἀναξηρᾶναι.

Τὰ γὰρ ἐν τῇ Θρᾴκῃ φυόμενα ῥιζία, καθάπερ τό τε τῇ νάρδῳ προσεμφερῆ τὴν ὀσμὴν ἔχον καὶ ἕτερ' ἄττα, μικράν τινα καὶ ἀσθενῆ τὴν εὐωδίαν ἔχει. καὶ περὶ μὲν τῶν εὐόσμων ἐπὶ τοσοῦτον εἰρήσθω.

VIII. Περὶ δὲ τῶν ὀπῶν ὅσα μὴ πρότερον εἴρηται, λέγω δ' οἷον εἴ τινες φαρμακώδεις ἢ καὶ ἄλλας ἔχουσι δυνάμεις, πειρατέον ὁμοίως εἰπεῖν· ἅμα δὲ καὶ περὶ ῥιζῶν, καὶ γὰρ τῶν ὀπῶν τινες ἐκ τούτων καὶ χωρὶς αὐταὶ καθ' αὑτὰς πολλὰς καὶ παντοίας ἔχουσι δυνάμεις, ὅλως δὲ περὶ πάντων φαρμακωδῶν, οἷον καρποῦ χυλισμοῦ φύλλων ῥιζῶν πόας· καλοῦσι γὰρ καὶ πόαν ἔνια τῶν φαρμακωδῶν οἱ ῥιζοτόμοι.

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[1] *cf. C.P.* 6. 14. 8; 6. 18. 12; Plin. 21. 40.
[2] See Index App. (25).

kostos all-heal saffron-crocus myrrh *kypeiron* ginger-grass sweet-flag sweet marjoram *lotos* dill. Of these it is the roots, bark, branches, wood, seeds, gum or flowers which in different cases yield the perfume. Some of them grow in many places, but the most excellent and most fragrant all come from Asia and sunny regions. From Europe itself comes none of them except the iris.

[1] This is best in Illyria, not in the part near the sea, but in that which is further inland and lies more to the north. In different districts it varies in quality; no special attention is needed, except to scrape the roots clean and dry them.

As for the roots which grow in Thrace, such as one[2] which has a smell like spikenard and certain others, their fragrance is but slight and feeble. Let this suffice for an account of sweet-smelling plants.

Of the medicinal juices of plants and the collection of them: general account.

VIII. Now we must endeavour to speak in like manner of those juices which have not been mentioned already, I mean, such as are medicinal or have other properties; and at the same time we must speak of roots; for some of the juices are derived from roots, and apart from that roots have in themselves divers properties of all kinds; and in general we must discuss medicinal things of all kinds, as fruit, extracted juice,[3] leaves, roots, 'herbs'; for the herb-diggers call some medicinal things by this name.

[3] χυλισμοῦ P_2Ald.H; καυλοῦ conj. W. The list is of the aspects in which the herbalist would regard the plant, not of the parts of the plant.

Τῶν δὲ ῥιζῶν πλείους μέν εἰσιν αἱ δυνάμεις καὶ πρὸς πλείω· ζητοῦνται δὲ μάλιστα αἱ φαρμακώδεις ὡς χρησιμώταται, διαφέρουσαι τῷ τε μὴ πρὸς ταὐτὰ καὶ τῷ μὴ ἐν τοῖς αὐτοῖς ἔχειν τὴν δύναμιν. ὡς δ' οὖν ἐπὶ πᾶν αἱ πλεῖσται μὲν ἐν αὑταῖς ἔχουσι καὶ τοῖς καρποῖς καὶ τοῖς ὀποῖς, ἔνιαι δὲ καὶ ἐν τοῖς φύλλοις· τὰς δὲ φυλλώδεις δυνάμεις τὰς πολλὰς σχεδὸν πόας καλοῦσιν, ὥσπερ εἴρηται μικρῷ πρότερον, οἱ ῥιζοτόμοι.

2 Ὁ μὲν οὖν ὀπισμὸς γίνεται τῶν ὀπιζομένων ὡς ἐπὶ τὸ πολὺ τοῦ θέρους, τῶν μὲν ἑνισταμένου τῶν δὲ προεληλυθότος. ἡ δὲ ῥιζοτομία γίνεταί τινων καὶ ὑπὸ πυροτομίαν καὶ μικρῷ πρότερον, οὐ μὴν ἀλλ' ἥ γε πλείων τοῦ μετοπώρου μετ' Ἀρκτοῦρον, ὅταν φυλλορροήσωσιν, ὅσων δὲ καὶ ὁ καρπὸς χρήσιμος, ὅταν ἀμερθῶσι τὸν καρπόν. ἔστι δὲ ὁ ὀπισμὸς ἢ ἀπὸ τῶν καυλῶν, ὥσπερ τοῦ τιθυμάλλου καὶ τῆς θριδακίνης καὶ σχεδὸν τῶν πλείστων, ἢ ἀπὸ τῶν ῥιζῶν, ἢ τρίτον ἀπὸ τῆς κεφαλῆς, ὥσπερ τῆς μήκωνος· ταύτης γὰρ μόνης οὕτω καὶ τοῦτ' ἴδιον αὐτῆς. τῶν μὲν οὖν καὶ αὐτόματος ὁ ὀπὸς

[1] From this point to 9. 19. 4, *γίνεσθαι*, the text is repeated in U, with considerable variations, as a tenth book. Ald. also repeats the first few lines of this passage (down to end of § 1) as a fragment of a tenth book. The two Medicean MSS also repeat 9. 8. 1, *τῶν δὲ ῥιζῶν*, down to 9. 10. 3, *βέλτιστοι δὲ καὶ οἷς*, as part of a tenth book. The 'tenth book' readings in each case are distinguished by a *.

[2] *ῥιζῶν*: *ῥίζα* signifies a medicinal plant in general (*cf.* *ῥιζότομοι*) as well as 'root'; the double sense makes translation of this section awkward: I print it 'root' where it has the wider sense.

[1] The properties of 'roots' [2] are numerous and they have numerous uses; but those which have medicinal virtues are especially sought after, as being the most useful; and they differ in not all being applied to the same [3] purposes and in not all having their virtue in the same parts of them.[4] To speak generally, most 'roots' have it in themselves [5]; or else it is found in the fruits or the juices of the plant; and in some cases in the leaves as well, and it is to the virtues of the leaves in most cases that the herb-diggers refer, when they speak, as has just been said,[6] of 'herbs.'

The collection of the juice from plants from which it is collected is mostly done in summer, in some cases at the beginning of that season, in others when it is well advanced. The digging of roots is done in some cases at the time of wheat-harvest or a little earlier, but the greater part of it in autumn after the rising of Arcturus when the plants have shed their leaves, and, in the case of those whose fruit is serviceable, when they have lost their fruit. The collection of juice is made either from the stalks,[7] as with *tithymallos* (spurge) wild lettuce and the majority of plants, or from the roots, or thirdly from the head, as in the case of the poppy; for this is the only plant which is so treated [8] and this is its peculiarity. In some plants the juice collects of its own accord in

[3] *ταὐτὰ* conj. Scal. from G; *ταῦτα* Ald.

[4] After *δύναμιν* U*Ald.* add *ὥσπερ εἴρηται μικρῷ πρότερον*; omitted here by Sch.: see below.

[5] Sc. in the roots.

[6] *ὥσπερ . . . πρότερον* inserted here by Sch.: see above; *ὥσπερ εἴρηται* Ald.

[7] *καυλῶν* Vin.Vo.Cod.Cas.: so also G; *καρπῶν* Ald.HM*.

[8] *μόνης οὕτω καὶ* conj. W.; *μόνης καὶ* Ald.H; *μόνον οὕτω καὶ* M*.

συνίσταται δακρυώδης τις, ὥσπερ καὶ τῆς τραγακάνθης· ταύτην γὰρ οὐδὲ τέμνειν ἐστί· τῶν δὲ πλείστων ἀπὸ τῆς ἐντομῆς. ὧν ἐνίους μὲν εὐθὺς εἰς ἀγγεῖα συνάγουσιν, ὥσπερ καὶ τὸν τοῦ τιθυμάλλου ἢ μηκωνίου, καλοῦσι γὰρ ἀμφοτέρως, καὶ ἁπλῶς ὅσα πολύοπα τυγχάνει· τῶν δὲ μὴ πολυόπων ἐρίῳ λαμβάνουσιν ὥσπερ καὶ τῆς θριδακίνης.

3 Ἐνίων δ' οὐδ' ὀπισμὸς ἀλλ' οἷον χυλισμός ἐστιν, ὥσπερ ὅσα κόψαντες ἢ τρίψαντες καὶ ὕδωρ ἐπιχέαντες ἀπηθοῦσι καὶ λαμβάνουσι τὴν ὑπόστασιν· ξηρὸς δὲ δῆλον ὅτι καὶ ἐλάττων ὁ χυλὸς τούτων. ἔστι δὲ τῶν μὲν ἄλλων ῥιζῶν τὸ χύλισμα ἀσθενέστερον τοῦ καρποῦ, τοῦ κωνείου δὲ ἰσχυρότερον, καὶ τὴν ἀπαλλαγὴν ῥᾴω ποιεῖ καὶ θάττω μικρὸν πάνυ καταπότιον δοθέν· ἐνεργότερον δὲ καὶ εἰς τὰς ἄλλας χρείας. ἰσχυρὸν δὲ καὶ τὸ τῆς θαψίας. τὰ δὲ ἄλλα πάντα ἀσθενέστερα. οἱ μὲν οὖν ὀπισμοὶ σχεδὸν τοσαυταχῶς γίνονται.

4 Τῆς δὲ ῥιζοτομίας οὐκ ἔστι τοιαύτη διαφορὰ πλὴν ἐν ταῖς ὥραις οἷον θέρους ἢ μετοπώρου, καὶ τῷ τάσδε ἢ τάσδε τῶν ῥιζῶν· οἷον τοῦ ἐλλεβόρου τὰς κάτω τὰς λεπτάς· τὴν γὰρ ἄνω τὴν παχεῖαν τὴν κεφαλώδη φασὶν ἀχρεῖον εἶναι καὶ διδόναι

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[1] *cf.* Diosc. 2. 136 ; Plin. 20. 58.
[2] *cf.* Diosc. 3. 7.
[3] ῥᾴω conj. Sch.; ῥαιο U; ῥᾳδίως M*Ald.

the form of a sort of gum, as with tragacanth; for incision of this plant cannot be made; but in most it is obtained by incision. In some cases the juice is collected straight into vessels, for instance that of *tithymallos* (spurge) or *mekonion* (for the plant has both names) and in general the juice of specially juicy plants is so collected. But that of those which do not yield abundant juice is taken with a piece of wool, as also that of wild lettuce.[1]

[2] In some cases there can be no collection of juice, but there is a sort of extraction of it, for instance in the case of plants which are cut down or bruised; they then pour water over them and strain off the fluid, keeping the sediment; but it is plain that in these cases the juice obtained is dry and less copious. In most 'roots' the juice thus extracted is less powerful than that of the fruit, but in hemlock it is stronger and it causes an easier[3] and speedier[4] death even when administered in a quite small pill; and it is also more effective for other uses. [5] That of *thapsia* is also powerful, while all the rest are less so. Such then is a general account of the various ways of obtaining the juices of plants.

Of the cutting of roots for medicinal purposes, and of certain superstitions connected therewith.

As to cutting of the roots there is no such diversity of practice, except as to the season, which may be summer or autumn, and as to the particular roots selected. [6] Thus in hellebore the slender lower roots are taken, for they say that the thick upper part[7] which forms a sort of head is useless, and that

[4] *θάττω* conj. Sch.; *ἐλάττω* UM; *θᾶττον* U*M*Ald.
[5] *cf.* Plin. 13. 125. [6] Plin. 25. 53. [7] *i.e.* rhizome.

ταῖς κυσὶν ὅταν βούλωνται καθαίρειν. καὶ ἐφ ἑτέρων δέ τινων τοιαύτας λέγουσι διαφοράς.

5 Ἔτι δὲ ὅσα οἱ φαρμακοπῶλαι καὶ οἱ ῥιζοτόμοι τὰ μὲν ἴσως οἰκείως τὰ δὲ καὶ ἐπιτραγωδοῦντες λέγουσι. κελεύουσι γὰρ τὰς μὲν κατ' ἄνεμον ἱσταμένους τέμνειν, ὥσπερ ἑτέρας τέ τινας καὶ τὴν θαψίαν, ἀλειψάμενον λίπα· τὸ γὰρ σῶμα ἀνοιδεῖν ἐὰν ἐξ ἐναντίας. κατ' ἄνεμον δὲ καὶ τοῦ κυνοσβάτου τὸν καρπὸν συλλέγειν, εἰ δὲ μὴ κίνδυνον εἶναι τῶν ὀφθαλμῶν. τὰς δὲ νύκτωρ τὰς δὲ μεθ' ἡμέραν, ἐνίας δὲ πρὶν τὸν ἥλιον ἐπιβάλλειν, οἷον καὶ τὸ καλούμενον κλύμενον.

6 Καὶ ταῦτα μὲν καὶ τὰ παραπλήσια τούτοις τάχ' ἂν οὐκ ἀλλοτρίως δόξειεν λέγειν· ἐπισινεῖς γάρ τινων αἱ δυνάμεις· ἐξάπτειν γάρ φασιν ὥσπερ πῦρ καὶ κατακαίειν· ἐπεὶ καὶ ὁ ἐλλέβορος ταχὺ καρηβαρεῖν ποιεῖ, καὶ οὐ δύνανται πολὺν χρόνον ὀρύττειν, δι' ὃ καὶ προεσθίουσι σκόροδα καὶ ἄκρατον ἐπιπίνουσιν. ἀλλὰ τὰ τοιαῦτα ὥσπερ ἐπίθετα καὶ πόρρωθεν, οἷον τὴν παιωνίαν, οἱ δὲ γλυκυσίδην καλοῦσι, νύκτωρ κελεύουσιν ὀρύττειν· ἐὰν γὰρ ἡμέρας καὶ ὀφθῇ τις ὑπὸ δρυοκολάπτου τὸν μὲν καρπὸν ἀπολέγων κινδυνεύειν τοῖς ὀφθαλμοῖς, τὴν δὲ ῥίζαν τέμνων ἐκπίπτειν τὴν ἕδραν.

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[1] ἔτι δὲ ὅσα conj. Sch. from G ; ἔτι δ' ὡς U*; ἔτι δὲ ὡς Ald. H ; ἐστι δὲ ὡς M*.

it is only given to dogs when it is desired to purge them. And in certain other plants also such differences are mentioned.

Further we may [1] add statements made by druggists and herb-diggers, which in some cases may be to the point, but in others contain exaggeration. Thus they enjoin that in cutting some roots one should stand to windward,—for instance, in cutting *thapsia* among others, and that one should first anoint oneself with oil,[2] for that one's body will swell up if one stands the other way. Also that the fruit of the wild rose must be gathered standing to windward, since otherwise there is danger to the eyes. Also that some roots should be gathered at night, others by day, and some before the sun strikes on them, for instance those of the plant called honeysuckle.[3]

These and similar remarks may well seem to be not off the point, for the properties of these plants are hurtful; they take hold, it is said, like fire and burn; [4] for hellebore too soon makes the head heavy, and men cannot go on digging it up for long; wherefore they first eat garlic and take a draught of neat wine therewith. On the other hand the following ideas may be considered far-fetched and irrelevant; [5] for instance they say that the peony, which some call *glykyside*, should be dug up at night, for, if a man does it in the day-time and is observed by a woodpecker while he is gathering the fruit, he risks the loss of his eyesight; and, if he is cutting the root at the time, he gets *prolapsus ani*.

[2] Plin. 13. 124; Diosc. 4. 153.
[3] *cf.* 9. 18. 6. [4] Plin. 25. 50.
[5] Plin. 27. 85; 25. 29.

7 Φυλάττεσθαι δὲ καὶ τὴν κενταυρίδα τέμνοντα τριόρχην, ὅπως ἂν ἄτρωτος ἀπέλθῃ. καὶ ἄλλας δέ τινας αἰτίας. τὸ δ' ἐπευχόμενον τέμνειν οὐθὲν ἴσως ἄτοπον· ἀλλ' εἴ τι καὶ ἄλλο προστιθέασιν, οἷον ὅταν τὸ πάνακες τὸ Ἀσκληπίειον καλούμενον· ἀντεμβάλλειν γὰρ τῇ γῇ παγκαρπίαν <καὶ> μελιττοῦταν· ὅταν δὲ τὴν ξίριν, τριμήνου μελιττούτας ἀντεμβάλλειν μισθόν· τέμνειν δὲ ἀμφήκει ξίφει περιγράψαντα εἰς τρίς· καὶ ὅτι ἂν πρῶτον τμηθῇ μετέωρον ἔχειν εἶθ' οὕτω τὸ ἕτερον τέμνειν.

8 Καὶ ἄλλα δὲ τοιαῦτα πλείω. περιγράφειν δὲ καὶ τὸν μανδραγόραν εἰς τρὶς ξίφει, τέμνειν δὲ πρὸς ἑσπέραν βλέποντα. τὸν δ' ἕτερον κύκλῳ περιορχεῖσθαι καὶ λέγειν ὡς πλεῖστα περὶ ἀφροδισίων. τοῦτο δ' ὅμοιον ἔοικε τῷ περὶ τοῦ κυμίνου λεγομένῳ κατὰ τὴν βλασφημίαν ὅταν σπείρωσι. περιγράφειν δὲ καὶ τὸν ἐλλέβορον τὸν μέλανα καὶ τέμνειν ἱστάμενον πρὸς ἕω καὶ κατευχόμενον· ἀετὸν δὲ φυλάττεσθαι καὶ ἐκ δεξιᾶς καὶ ἐξ ἀριστερᾶς· κίνδυνον γὰρ εἶναι τοῖς τέμνουσιν, ἐάνπερ ἐγγὺς ἐπιγένηται ὁ ἀετός, ἀπο-

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[1] Plin. 25. 69 adds that this plant was therefore also called τρίορχις. *cf.* Diosc. 4. 162.

[2] καὶ . . . αἰτίας U*M*; ? καὶ ἄλλα δὲ τοιαῦτα W.

[3] Plin. 25. 30 and 31.

It is also said that, while cutting feverwort[1] one must beware of the buzzard-hawk, if one wishes to come off unhurt; and other reasons for caution[2] are also given. That one should be bidden to pray while cutting is not perhaps unreasonable, but the additions made to this injunction are absurd; for instance as to cutting the kind of all-heal which is called that of Asklepios;[3] for then it is said that one should put in the ground in its place an offering made of all kinds of fruits and a cake; and that, when one is cutting gladwyn,[4] one should put in its place to pay for it cakes of meal from spring-sown wheat,[5] and that one should cut it with a two-edged sword, first making a circle round it three times,[6] and that the piece first cut must be held up in the air while the rest is being cut.

And many similar notions are mentioned. Thus it is said that one should draw three circles round mandrake with a sword, and cut it with one's face towards the west; and at the cutting of the second piece one should dance round the plant and say as many things as possible about the mysteries of love. (This seems to be like the direction given about cummin,[7] that one should utter curses at the time of sowing.) One should also, it is said, draw a circle round the black hellebore and cut it standing towards the east and saying prayers, and one should look out for an eagle both on the right and on the left; for that there is danger to those that cut, if your eagle should come near, that

[1] *cf.* Plin. 21. 42, who read *Ἶριν*. *cf.* Diosc. 4. 22, where *ξυρίς* is called a kind of *Ἶρις*; so also Plin. 21. 142.

[5] *τριμήνου* conj. Salm.; *τριμήνους* M*Ald.H.

[6] *τρὶς* conj. Sch.; *τρεῖς* U*M*P_2Ald. So also in next section.

[7] *cf.* 7. 3. 3.

θνήσκειν ἐνιαυτῷ. ταῦτα μὲν οὖν ἐπιθέτοις ἔοικεν, ὥσπερ εἴρηται. τρόποι δ' οὐκ εἰσὶ τῶν ῥιζοτομιῶν πλὴν οὓς εἴπομεν.

IX. Ἔστι δέ, ὥσπερ ἐλέχθη, τῶν μὲν πάντα χρήσιμα καὶ ἡ ῥίζα καὶ ὁ καρπὸς καὶ ὁ ὀπός, ὥσπερ ἄλλων τε καὶ τοῦ πανάκους· τῶν δὲ ἡ ῥίζα καὶ ὁ ὀπός, οἷον τῆς σκαμμωνίας καὶ τοῦ κυκλαμίνου καὶ τῆς θαψίας καὶ ἑτέρων, καθάπερ καὶ τοῦ μανδραγόρου· τοῦ γὰρ μανδραγόρου τὸ φύλλον χρήσιμον εἶναί φασι πρὸς τὰ ἕλκη μετ' ἀλφίτου, τὴν δὲ ῥίζαν πρὸς ἐρυσίπελας ξυσθεῖσάν τε καὶ ὄξει δευθεῖσαν καὶ πρὸς τὰ ποδαγρικὰ καὶ πρὸς ὕπνον καὶ πρὸς φίλτρα· διδόασι δ' ἐν οἴνῳ ἢ ὄξει· τέμνουσι δὲ τροχίσκους ὥσπερ ῥαφανῖδος καὶ ἐνείραντες ὑπὲρ γλεύκους ἐκρέμασαν ἐπὶ καπνῷ.

2 Ὁ δὲ ἑλλέβορος ἐπὶ ταὐτὰ τῇ τε ῥίζῃ καὶ τῷ καρπῷ χρήσιμος, εἴπερ οἱ ἐν Ἀντικύρᾳ, καθάπερ φασί, τῷ καρπῷ καθαίρουσιν· ἔχει δὲ <τὸν> σησαμώδη τοῦτον.

Πλείω δὲ καὶ τοῦ πανάκους τὰ χρήσιμα καὶ οὐ πάντα πρὸς τὰ αὐτά· ἀλλ' ὁ μὲν καρπὸς πρὸς τὰς ἐξαμβλώσεις καὶ τὰς δυσουρίας, ὁ δὲ ὀπὸς ἡ χαλβάνη καλουμένη πρός τε τὰς ἐξαμβλώσεις καὶ πρὸς τὰ σπάσματα καὶ τοὺς τοιούτους πόνους, ἔτι δὲ πρὸς τὰ ὦτα καὶ τὰς φωνασκίας·

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[1] *ἐάνπερ ἐγγὺς ἐπιγένηται* conj. W.; *ἐὰν δὲ ὁ ἐγγὺς μὴ ἀποτέμνῃ ὁ αὐτὸς ἀποθνήσκει ἐνιαυτῷ* UMAld. Similar confusion with variations in U*M*PP$_2$: restoration a makeshift. *cf.* Plin. 25. 50.

[2] 9. 8. 1.

[3] Diosc. 4. 75; Plin. 26. 104 and 121.

[4] *cf.* 9. 12. 1.

they may die[1] within the year. These notions then seem to be irrelevant, as has been said. There are however no methods of root-cutting besides those which we have mentioned.

Of the medicinal uses of divers parts of plants.

IX. As was said,[2] of some plants the root, fruit and juice are all serviceable, as of all-heal among others; of some the root and the juice, as of scammony[3] cyclamen thapsia and others, such as mandrake; for the leaf of this, they say, used with meal, is useful for wounds, and the root for erysipelas, when scraped and steeped in vinegar, and also for gout, for sleeplessness, and for love potions. It is administered in wine or vinegar; they cut little balls of it, as of[4] radishes, and making a string of them hang them up in the smoke over must.

[5] Of hellebore both root and fruit are useful for the same purposes,[6]—if it is true, as is said, that the people of Anticyra use the fruit as a purge; this fruit contains the well-known[7] drug called *sesamodes*.

Various parts of all-heal are also useful, and not all for the same purposes; the fruit is used in cases of miscarriage and for disorders of the bladder, while the juice,[8] which is called *khalbane*, is used in cases of miscarriage and also for sprains and such-like troubles; also for the ears, and to strengthen the

[5] Diosc. 4. 108, 109 and 162.

[6] *ταὐτὰ* conj. Sch. from G; *ταῦτα* U*M*Ald.

[7] I have inserted *τὸν*. *cf.* 9. 14. 4; Plin. 22. 133; 25. 52 and 64; Diosc. *l.c.* The drug was actually called *σησαμοειδές* or *σησαμοειδήs*. For the sense of *τοῦτον cf.* 3. 7. 3; 3. 8. 3 and reff.

[8] This seems to be a mistake. *cf.* 9. 7. 2; Diosc. 3. 83; Plin. 12. 126.

ἡ δὲ ῥίζα πρός τε τοὺς τόκους καὶ τὰ γυναικεῖα καὶ πρὸς ὑποζυγίων φύσας· χρησίμη δὲ καὶ πρὸς τὸ ἴρινον μύρον διὰ τὴν εὐωδίαν· ἰσχυρότερον δὲ τὸ σπέρμα τῆς ῥίζης. γίνεται δὲ περὶ Συρίαν καὶ τέμνεται περὶ πυραμητόν.

3 Τοῦ δὲ κυκλαμίνου ἡ μὲν ῥίζα πρός τε τὰς ἐκπυήσεις[1] τῶν φλεγμονῶν καὶ πρόσθετον γυναιξὶ καὶ πρὸς τὰ ἕλκη ἐν μέλιτι· ὁ δὲ ὀπὸς πρὸς τὰς ἀπὸ κεφαλῆς καθάρσεις ἐν μέλιτι ἐγχεόμενος, καὶ πρὸς τὸ μεθύσκειν, ἐὰν ἐν οἴνῳ διαβρέχων διδῷ τις πίνειν. ἀγαθὴν δὲ τὴν ῥίζαν καὶ ὠκυτόκιοι περίαπτον καὶ εἰς φίλτρα· ὅταν δὲ ὀρύξωσι, κατακαίουσιν εἶτ' οἴνῳ δεύσαντες τροχίσκους ποιοῦσιν, ὥσπερ τῆς τρυγὸς ἢ ῥυπτόμεθα.

4 Καὶ τοῦ σικύου δὲ τοῦ ἀγρίου τὴν μὲν ῥίζαν <πρὸς> ἀλφοὺς καὶ ψώρας βοσκημάτων· τὸ δὲ σπέρμα χυλισθὲν ποιεῖ τὸ ἐλατήριον. συλλέγεται δὲ τοῦ φθινοπώρου· τότε γὰρ βέλτιστον.

5 Τῆς δὲ χαμαίδρυος τὰ μὲν φύλλα πρὸς τὰ ῥήγματα καὶ πρὸς τὰ τραύματα ἐν ἐλαίῳ τριβόμενα καὶ πρὸς τὰ νεμόμενα ἕλκη· τὸν δὲ καρπὸν καθαίρειν χολήν· ἀγαθὸν δὲ καὶ ὀφθαλμοῖς· πρὸς δὲ τὰ ἄργεμα προσάγειν τὸ φύλλον τρίψαντα ἐν ἐλαίῳ. ἔχει δὲ φύλλα μὲν οἱάπερ δρῦς, τὸ δὲ ἀνάστημα τῆς ὅλης ὅσον σπιθαμιαῖον· εὔοσμον δὲ καὶ ἡδύ.

Τὸ μὲν οὖν μὴ πρὸς ταὐτὸ πάντα τὰ μέρη χρήσιμα τυγχάνειν οὐκ ἴσως ἄτοπον· τὸ δὲ τῆς

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[1] ἐκπυήσεις conj. Coraës from Plin. 26. 120, *eruptiones*; ἐκπνεύσεις M*Ald.

[2] Diosc. 2. 164; Plin. 25. 133; 26. 149.

[3] *cf.* Plin. 23. 63.

voice. The root is used in childbirth, for diseases of women, and for flatulence in beasts of burden. It is also useful in making the iris-perfume because of its fragrance; but the seed is stronger than the root. It grows in Syria and is cut at the time of wheat-harvest.

Of cyclamen the root is used for suppurating[1] boils; also as a pessary for women and, mixed with honey, for dressing wounds; the juice for purgings of the head,[2] for which purpose it is mixed with honey and poured in; it also conduces to drunkenness, if one is given a draught of wine in which it has been steeped. They say also that the root is a good charm for inducing rapid delivery and as a love potion; [3] when they have dug it up, they burn it, and then, having steeped the ashes in wine, make little balls like those made of wine-lees which we use as soap.

[4] Of 'wild cucumber' (squirting cucumber) the root is used for[5] white leprosy and for mange in sheep, while the extracted juice makes the drug called 'the driver.'[6] It is collected in autumn, for then it is best.

Of germander the leaves pounded up in olive-oil are used for fractures and wounds and for spreading sores; the fruit purges bile, and is good also for the eyes; for ulcers[7] in the eye they pound up the leaf in olive-oil before applying it. It has leaves like the oak, but its entire growth is only about a palm high; and it is sweet both to smell and taste.

Now that all parts are not serviceable for the same purpose is perhaps not strange; it is more

[4] Diosc. 4. 150; Plin. 20. 3. [5] πρὸς add. St.
[6] *cf.* 9. 14. 1 and 2. [7] *cf.* 7. 6. 2; Diosc. 3. 98.

αὐτῆς ῥίζης τὸ μὲν ἄνω τὸ δὲ κάτω καθαίρειν θαυμασιώτερον, οἷον καὶ τῆς θαψίας καὶ τῆς ἰσχάδος, οἱ δ' ἄπιον καλοῦσι, καὶ τῆς λιβανωτίδος· ὅτι γὰρ αὖ καὶ κάτω καὶ ἄνω ταὐτὰ δύναται [καθαίρειν], καθάπερ τὸ ἐλατήριον, οὐθὲν ἄτοπον.

6 Ἔχει δὲ ἡ θαψία φύλλον μὲν ὅμοιον τῷ μαράθῳ πλὴν πλατύτερον καυλὸν δὲ ναρθηκώδη ῥίζαν δὲ λευκήν.

Ἡ δ' ἰσχὰς ἢ ἄπιος φύλλον μὲν ἔχει πηγανῶδες βραχὺ καυλοὺς δ' ἐπιγείους τρεῖς ἢ τέτταρας ῥίζαν δὲ οἵανπερ ὁ ἀσφόδελος πλὴν λεπυριώδη· φιλεῖ δὲ ὀρεινὰ χωρία καὶ κοχλακώδη. συλλέγεται δὲ τοῦ ἦρος. τοῦτο μὲν οὖν ἴδιον τῶν εἰρημένων.

X. Ὁ δὲ ἑλλέβορος ὅ τε μέλας καὶ ὁ λευκὸς ὥσπερ ὁμώνυμοι φαίνονται· περὶ δὲ τῆς ὄψεως διαφωνοῦσιν· οἱ μὲν γὰρ ὁμοίους εἶναι, πλὴν τῷ χρώματι μόνον διαφέρειν τὴν ῥίζαν τοῦ μὲν λευκὴν τοῦ δὲ μέλαιναν· οἱ δὲ τοῦ μὲν μέλανος τὸ φύλλον δαφνῶδες τοῦ δὲ λευκοῦ πρασῶδες, τὰς δὲ ῥίζας ὁμοίας πλὴν τῶν χρωμάτων. οἱ δ' οὖν ὁμοίους λέγοντες τοιάνδε φασὶν εἶναι τὴν μορφήν· καυλὸν μὲν ἀνθερικώδη βραχὺν σφόδρα· φύλλον δὲ πλατύσχιστον, παρόμοιον σφόδρα τῷ τοῦ νάρθηκος, μῆκος δ' ἔχον· εὐθὺ δ' ἐκ τῆς ῥίζης

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[1] ὅτι γὰρ conj. W.; ὅσα γὰρ UU*M*; τὰ γὰρ M; τὸ γὰρ Ald.
[2] Diosc. 4. 153; Plin. 13. 124. [3] Diosc. 4. 175.

surprising that part of the same 'root' should purge upwards and another part downwards, as is the case with *thapsia* and *iskhas*—which some call *apios* (spurge)—and with *libanotis*; for [1] it is not strange that on the other hand the same parts should purge both upwards and downwards, as is the case with 'the driver.'

[2] *Thapsia* has a leaf like fennel, but broader, a stalk like that of ferula, and a white root.

[3] *Iskhas* (or *apios*) has a leaf like rue and short, three or four prostrate stems, and a root like that of asphodel, except that it is composed of scales; [4] it loves mountain districts with a gravelly soil. It is collected in spring. Now this account applies only to the above-mentioned plants.

Of hellebores, the white and the black: their uses and distribution.

X. [5] The white and the black hellebore appear to have nothing in common except the name. But accounts differ as to the appearance of the plants; some say that the two are alike and differ only in colour, the root of the one being white, of the other black; some however say that the leaf of the 'black' is like that of bay, that of the white like that of the leek, but that the roots are alike except for their respective colours. Now those who say that the two plants are alike describe the appearance [6] as follows:—the stem is like that of asphodel and very short; the leaf has broad divisions, and is extremely like that of ferula, but is long; it is closely attached to the root and

[4] *cf.* Diosc. 3. 134.

[5] Plin. 25. 47–61. See Index. *cf.* 9. 11. 5 n.

[6] *i.e.* of the two plants regarded as one; but the text of the following description seems to be hopelessly confused.

ἠρτημένον καὶ ἐπιγειόφυλλον· πολύρριζον δ' εὖ μάλα ταῖς λεπταῖς καὶ χρησίμοις.

2 Ἀναιρεῖν δὲ τὸν μὲν μέλανα καὶ ἵππους καὶ βοῦς καὶ ὗς, δι' ὃ καὶ οὐδὲν νέμεσθαι τούτων· τὸν δὲ λευκὸν νέμεσθαι τὰ πρόβατα καὶ ἐκ τούτου πρῶτον συνοφθῆναι τὴν δύναμιν καθαιρομένων ἐκείνων· ὡραῖος δὲ μετοπώρου, τοῦ δ' ἦρος ἄωρος· ἀλλὰ πρὸς τὴν πυλαίαν οἱ ἐκ τῆς Οἴτης συλλέγουσι· πλεῖστος γὰρ ἐνταῦθα φύεται καὶ ἄριστος· μοναχοῦ δὲ φύεται τῆς Οἴτης περὶ τὴν Πυράν.

Μίσγεται δὲ πρὸς τὴν πόσιν, ὅπως εὐεμὲς ᾖ, τὸ τῆς ἐλλεβορίνης σπέρμα· τοῦτο δ' ἐστὶ ποάριον.

3 Φύεται δὲ ὁ μὲν μέλας πανταχοῦ· καὶ γὰρ ἐν τῇ Βοιωτίᾳ καὶ ἐν Εὐβοίᾳ καὶ παρ' ἄλλοις πολλοῖς· ἄριστος δὲ ὁ ἐκ τοῦ Ἑλικῶνος, καὶ ὅλως τὸ ὄρος εὐφάρμακον. ὁ δὲ λευκὸς ὀλιγαχοῦ· βέλτιστοι δὲ καὶ οἷς χρῶνται μάλιστα τέτταρες ὁ Οἰταῖος ὁ Ποντικὸς ὁ Ἐλεάτης ὁ Μαλιώτης. φασὶ δὲ τὸν Ἐλεάτην ἐν τοῖς ἀμπελῶσι φύεσθαι καὶ ποιεῖν τὸν οἶνον οὕτω διουρητικὸν ὥστε λαγαροὺς εἶναι πάνυ τοὺς πίνοντας.

4 Ἄριστος δὲ πάντων καὶ τούτων καὶ τῶν ἄλλων ὁ Οἰταῖος. ὁ δὲ Παρνάσιος καὶ ὁ Λιτωλικός, γίνεται γὰρ καὶ ἐνταῦθα καὶ πολλοὶ καὶ ὠνοῦνται καὶ πωλοῦσιν οὐκ εἰδότες, [οὐχ ὅτε] σκληροὶ καὶ

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[1] Which were held apparently at Thermopylae regularly in autumn and sometimes in spring: the meeting would give opportunities for sale. ἀλλὰ implies a spring meeting.

creeps on the ground; the plant has numerous roots, to wit, the slender roots which are serviceable.

Also they say that the black is fatal to horses oxen and pigs, wherefore none of these animals eat it; while the white is eaten by sheep, and from this circumstance the virtue of the plant was first observed, since it purges them; it is at its prime in autumn, and past its prime when spring comes. However the people of Mount Oeta gather it for the meetings[1] of the Amphictyons; for it grows there in greatest abundance and best, though at only one place in the district of Oeta, namely about Pyra.

(The seed of rupture-wort is mixed with the potion given to promote easy vomiting; this plant is a small herb).

The black kind of hellebore grows everywhere; it is found in Boeotia, in Euboea and in many other places; but best is that from Mount Helicon, which mountain is in general rich in medicinal herbs. The white occurs in few places; the best and that which is most used comes from one of four places, Oeta,[2] Pontus, Elea, and Malea.[3] They say that that of Elea grows in the vineyards and makes the wine so diuretic that those who drink it become quite emaciated.

But best of all these and better than that found anywhere else is that of Mount Oeta, while that of Parnassus and that of Aetolia (for the plant is common in these parts too and men buy and sell it, not knowing[4] the difference) are tough and ex-

[2] ὁ before Οἰταῖος add. Sch.

[3] Μαλιώτης conj. Hahnemann, *cf.* Strabo 9. 3. 3; Μασσαλιώτης Ald. Plin. *l.c.* gives Parnassus as the fourth locality: *cf.* § 4.

[4] The words οὐχ ὅτε may have arisen from οὐκ εἰδότες.

ἄγαν περισκελεῖς. ταῦτα μὲν οὖν ὅμοια ταῖς μορφαῖς ὄντα ταῖς δυνάμεσι διαφέροντα.

Καλοῦσι δὲ τὸν μέλανά τινες ἔκτομον Μελαμπόδιον, ὡς ἐκείνου πρῶτον τεμόντος καὶ ἀνευρόντος. καθαίρουσι δὲ καὶ οἰκίας αὐτῷ καὶ πρόβατα συνεπᾴδοντές τινα ἐπῳδὴν καὶ εἰς ἄλλα δὲ πλείω χρῶνται.

XI. Πολλὰ δέ ἐστι καὶ τὰ πανάκη καὶ οἱ τιθύμαλλοι καὶ ἕτερ' ἄττα. πάνακες γὰρ καλοῦσι πρῶτον μὲν τὸ ἐν Συρίᾳ, περὶ οὗ μικρῷ πρότερον εἴρηται. ἄλλα δὲ τὰ τρία, τὸ μὲν Χειρώνειον καλούμενον τὸ δ' Ἀσκληπίειον τὸ δ' Ἡράκλειον. ἔχει δὲ τὸ μὲν Χειρώνειον φύλλον μὲν ὅμοιον λαπάθῳ μεῖζον δὲ καὶ δασύτερον, ἄνθος δὲ χρυσοειδές, ῥίζαν δὲ μικράν· φιλεῖ δὲ μάλιστα τὰ χωρία τὰ πίονα· χρῶνται δὲ πρός τε τοὺς ἕξεις καὶ τὰ φαλάγγια καὶ τοὺς σῆπας καὶ τὰ ἄλλα ἑρπετὰ διδόντες ἐν οἴνῳ καὶ ἀλείφοντες μετ' ἐλαίου· τοῦ δ' ἕχεως τὸ δῆγμα καὶ καταπλάττοντες καὶ ἐν ὀξίνῃ πιεῖν διδόντες· ἀγαθὴν δέ φασι καὶ ἑλκῶν ἐν οἴνῳ καὶ ἐλαίῳ καὶ φυμάτων ἐν μέλιτι.

2 Τὸ δ' Ἀσκληπίειον τὴν ῥίζαν μῆκος μὲν ὡς σπιθαμὴν λευκὴν δὲ καὶ παχεῖαν σφόδρα, καὶ φλοιὸν παχὺν καὶ ἁλυκώδη· καυλὸν δὲ ἔχει γονατώδη πανταχόθεν, φύλλον δὲ οἱόνπερ ἡ θαψία πλὴν παχύτερον· ἀγαθὸν δὲ εἶναί φασι ἑρπετῶν

[1] From this phrase ἔκτομον came to be used as a synonym for 'black hellebore.' *cf.* Plin. 25. 47; Diosc. 4. 149; Hesych. and Galen, *Lex. Hipp. s.v.*

[2] 9. 9. 2. [3] Plin. 25. 32; 26. 139.

[4] μικρὰν conj. H. from Plin. 25. 32. *radix parva*; μακρὰν U* Ald.

ceeding harsh. These plants then, while resembling the best form in appearance, differ in their virtues.

Some call the black the 'hellebore of Melampus,'[1] saying that he first cut and discovered it. Men also purify horses and sheep with it, at the same time chanting an incantation; and they put it to several other uses.

Of the various kinds of all-heal.

XI. There are also several kinds of all-heal *tithymallos* (spurge) and other herbs. To begin with, one plant called all-heal is the one found in Syria, of which we have recently spoken.[2] [3]Then come the three other kinds, known as that of Chaeronea, that of Asclepios, and that of Heracles. That of Chaeronea has a leaf like monk's rhubarb, but larger and rougher, a golden flower, and a small [4] root; and it specially loves rich ground; they use it for the bites of snakes, spiders, vipers [5] and other reptiles, administering it in wine or anointing the place with it mixed with olive-oil. In treating a snake-bite they use a plaster of it, and also give a draught of it mixed with vinegar [6]; and they also say that it is good for sores [7] when mixed with wine and olive-oil, and for tumours when mixed with honey.

[8]The kind called after Asklepios has a white and very stout root about a span long and a thick bark which is crusted with salt [9]; its stem is jointed all the way up, its leaf like that of *thapsia*, but thicker; it is said that it is good to scrape and drink

[5] *σῆτας* conj. Scal., *cf.* Arist. *Mir. Ausc.* 164; *σῆτας* Ald.
[6] *καὶ ἐν ὀξίνῃ* conj. Sch., *cf.* 9. 13. 3; *ἐν ὀξίνῃ καὶ* PAld.
[7] For the genitive *cf.* §§ 2, 3; Xen. *Mem.* 3. 8. 3.
[8] Plin. 25. 30; Diosc. 3. 49.
[9] *ἀλυκώδη*: ? 'has a briny taste.'

τε ξύοντα πίνειν, καὶ σπληνὸς ὅταν αἷμα περὶ αὐτὸν ἐν μελικράτῳ, καὶ κεφαλαίας τρίβοντα ἐν ἐλαίῳ ἀλείφειν καὶ ἄλλο τι ἐὰν πονῇ τις ἀφανές, καὶ γαστρὸς ὀδύνης ἐν οἴνῳ ξύοντα. δύνασθαι δὲ καὶ τὰς μακρὰς ἀρρωστίας ἐκκλίνειν. ἔπειτα τῶν ἑλκῶν τῶν μὲν ὑγρῶν ξηρὸν ἐπιπάττοντα προκατακλύζοντα ἐν οἴνῳ θερμῷ, τῶν δὲ ξηρῶν ἐν οἴνῳ δεῦσαι καὶ καταπλάττειν.

3 Τὸ δ' Ἡράκλειον φύλλον μὲν ἔχει μέγα καὶ πλατὺ καὶ τρισπίθαμον πανταχῇ, ῥίζαν δὲ ὡς δακτύλου τὸ πάχος δίκραν ἢ τρίκραν, τῇ γεύσει μὲν ὑπόπικρον τῇ δ' ὀσμῇ καθάπερ λιβανωτοῦ καθαροῦ· ἀγαθὴν δὲ τῆς ἱερᾶς νόσου μιγνυμένην φώκης πιτύᾳ ὅσον τεταρτημόριον πίνειν, καὶ ὀδύνης κατὰ γαστέρα ἐν οἴνῳ γλυκεῖ, καὶ ἑλκῶν τῶν μὲν ὑγρῶν ξηρὰν τῶν δὲ ξηρῶν ἐν μέλιτι. αὗται μὲν οὖν ταύτας ἔχουσι διαφοράς τε καὶ δυνάμεις.

4 Ἄλλα δὲ πανάκη τὸ μὲν λεπτόφυλλον τὸ δὲ οὔ· αἱ δὲ δυνάμεις ἀμφοῖν αἱ αὐταί, πρόσθετόν τε γυναιξὶ καὶ κατάπλασμα μετ' ἀλφίτου καὶ πρὸς τὰ ἕλκη τὰ ἄλλα καὶ πρὸς τὰ νεμόμενα.

5 Συνόψυμοι δὲ καὶ οἱ στρύχνοι καὶ οἱ τιθύμαλ-

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[1] κεφαλαίας conj. Sch.; κεφαλῆς Ald.

[2] τῶν ἑλκῶν conj. Sch.; τῶν δὲ ἑλκώδων (*sic*) U*; τῶν ἑλκωδῶν Ald. H. *cf.* § 3.

[3] Plin. 25. 32; Diosc. 3. 48.

[4] δίκραν ἢ τρίκραν conj. Sch.; δίκραν ἢ τρίκαν UM; δικρανῆ πικρὰν U*; δικρανῆ ἢ τρικρανῆ Ald.

it against bites of reptiles, to take it in a posset of honey for disorders of the spleen, when the blood collects about it, and against headache[1] to pound it up in olive-oil and anoint the head; that it is of use also in other obscure troubles, and against stomach-ache, if scraped and taken in wine. It is said also to be able to prevent long periods of sickness. Again for running sores[2] one may sprinkle it on in hot wine, first washing the place, while for dry sores one may soak it in wine and apply a plaster.

[3] The kind named after Herakles has a large broad leaf, three spans each way, a root as thick as a man's finger, forking in two or three[4]; in taste it is somewhat bitter, in smell like pure frankincense[5]; [6] it is good to drink it against epilepsy, mixed with the rennet of a seal in the proportion of one to four, or in sweet wine against pain[7] in the stomach; it may be used dry[8] for running sores, and mixed with honey for dry ones. Such are the special features about these plants and their respective virtues.

[9] There are also other kinds of all-heal, of which one has a fine leaf, the other not; the properties of both kinds are the same; namely they are used as a pessary for women, and a plaster may be made of them mixed with meal for spreading sores as well as for ordinary sores.

Of the various plants called strykhnos.

As to *strykhnos* again and *tithymallos* (spurge) there is in either case more than one form of the plant

[5] λιβανωτοῦ καθαροῦ conj. Sch.; λιβανωτὸν καθαρὸν UM; λιβανωτοῦ U*; λιβανωτοῦ καθαρῶν Ald.H καθαροῦ perhaps due to καθάπερ. [6] *cf.* Fr. 175; Diosc. 2. 75.

[7] ὀδύνης conj. W.; ὀδύναι UMU*Ald.

[8] ξηρὰν conj. Sch.; ξηρὰ U*Ald.; ξηραὶ M. [9] Plin. 35. 33.

λοι. τῶν γὰρ στρύχνων ὁ μὲν ὑπνώδης ὁ δὲ μανικός. καὶ ὁ μὲν ὑπνώδης ἐρυθρὰν ἔχων τὴν ῥίζαν ὥσπερ αἷμα ξηραινομένην, ὀρυττομένην δὲ λευκήν, καὶ καρπὸν ἐρυθρότερον κρόκου, φύλλον δὲ τιθυμάλλῳ ὅμοιον ἢ μηλέᾳ τῇ γλυκείᾳ καὶ αὐτὸ δασὺ καὶ πυγμὴν μέγα. τούτου τῆς ῥίζης τὸν φλοιὸν κόπτοντες λίαν καὶ βρέχοντες ἐν οἴνῳ ἀκράτῳ διδόασι πιεῖν καὶ ποιεῖ καθεύδειν. φύεται δὲ ἐν χαράδραις καὶ τοῖς μνήμασιν.

6 Ὁ δὲ μανικός, οἱ δὲ θρύορον καλοῦσιν αὐτὸν οἱ δὲ περιττόν, λευκὴν ἔχει τὴν ῥίζαν καὶ μακρὰν ὡς πήχεως καὶ κοίλην. δίδοται δ' αὐτῆς, ἐὰν μὲν ὥστε παίζειν καὶ δοκεῖν ἑαυτῷ κάλλιστον εἶναι, δραχμὴ σταθμῷ· ἐὰν δὲ μᾶλλον μαίνεσθαι καὶ φαντασίας τινὰς φαίνεσθαι, δύο δραχμαί· ἐὰν δ' ὥστε μὴ παύεσθαι μαινόμενον τρεῖς, καὶ συμπαραμιγνύναι φασὶν ὀπὸν κενταυρίου· ἐὰν δὲ ὥστε ἀποκτεῖναι, τέτταρες. ἔχει δὲ τὸ μὲν φύλλον ὅμοιον εὐζώμῳ πλὴν μεῖζον, τὸν δὲ καυλὸν ὥσπερ ὀργυίας, κεφαλὴν δὲ ὥσπερ γηθύου μείζω δὲ καὶ δασυτέραν· ἔοικε δὲ καὶ πλατάνου καρπῷ.

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[1] *cf.* 7. 15. 4, where a third *στρύχνος* is mentioned, which is *ὁμώνυμος*, not *συνώνυμος*, *i.e.* which has nothing in common with these two *στρύχνοι* except the name. *cf.* also 9. 15. 5.

[2] *κρόκου* conj. Dalec. from Diosc. 4. 72, *καρπὸν . . . κροκίζοντα*; *κόκκου* MSS.

[3] *πυγμὴν μέγα* U; *πυθμὴν μέγας* U*Ald.H.; W. adopts Bod.'s conjecture *σπιθαμὴν μέγα*.

[4] Plin. 21. 177–179; Diosc. 4. 73.

[5] *θρύορον* Ald.H.; *θρυόρον* U*; *βρυόρον* U; *βρύορον* MmBas.;

denoted by the name. [1] Of the plants called *strykhnos* one induces sleep, the other (thorn-apple) causes madness. The first-mentioned has a root which becomes red like blood as it dries, but when first dug up it is white; its fruit is a deeper orange than saffron,[2] its leaf like that of *tithymallos* or the sweet apple; and it is itself rough, and about a foot high.[3] The 'bark' of the root of this they bruise severely, and soaking it in neat wine give it as a draught, and it induces sleep. It grows in water-courses and on tombs.

[4] The kind which produces madness (which some call *thryoron*[5] and some *peritton*[6]) has a white hollow root about a cubit long. Of this three twentieths of an ounce in weight is given, if the patient is to become merely sportive and to think himself a fine fellow; twice this dose[7] if he is to go mad outright and have delusions[8]; thrice the dose, if he is to be permanently insane; (and then they say that the juice of centaury is mixed with it); four[9] times the dose is given, if the man is to be killed. The leaf is like that of rocket, but larger, the stem about a fathom long; the 'head'[10] is like that of a long onion, but larger and rougher. And it also resembles the fruit of the plane-tree.

briorem G. Plin. *l.c.* seems to have read *ἐρυθρὸν*; Diosc. *l.c.* *βρύον*.

[6] *περιττὸν* Ald.H., *i.e.* 'violent'; *pissum* G; Plin. *l.c.* *perisson*; Diosc. *l.c.* *πέρσιον*.

[7] *δραχμαὶ* conj. Sch.; *δραχμὰς* Ald.

[8] *καὶ . . . φαίνεσθαι* om. UM: ungrammatical, and possibly a gloss; but *cf.* Diosc. and Plin. *l.c.*

[9] *τέτταρες* conj. Sch.; *τέτταρας* Ald; *τέσσαρας* U*.

[10] 7. 4. 10 it was said that *γήθυον* has no 'head,' *i.e.* bulb; here the 'head' seems to be the inflorescence. *cf.* Diosc. and Plin. *l.c.*

7 Τῶν δὲ τιθυμάλλων ὁ μὲν παράλιος καλούμενος κόκκινον φύλλον ἔχει περιφερές, καυλὸν δὲ καὶ τὸ ὅλον μέγεθος ὡς σπιθαμῆς τὸν δὲ καρπὸν λευκόν. ἀμᾶται δὲ ὅταν ἄρτι περκάζῃ σταφυλή, καὶ ξηρανθεὶς ὁ καρπὸς δίδοται πίνειν τριφθεὶς ὅσον τρίτον μέρος ὀξυβάφου.

8 Ὁ δ' ἄρρην καλούμενος τὸ μὲν φύλλον ἐλαιῶδες ἔχει, τὸ δὲ ὅλον μέγεθος πηχυαῖον. τοῦτον ὀπίζουσιν ἅμα τρυγητῷ καὶ θεραπεύσαντες οὕτως ὡς δεῖ χρῶνται· καθαίρει δὲ κάτω μᾶλλον.

9 Ὁ δὲ μυρτίτης καλούμενος τιθύμαλλος λευκός· τὸ μὲν φύλλον ἔχει καθάπερ ὁ μύρρινος, πλὴν ἀκανθῶδες ἀπ' ἄκρου· κλήματα δ' ἀφίησιν ἐπὶ τὴν γῆν ὡς σπιθαμιαῖα, ταῦτα δ' οὐχ ἅμα φέρει τὸν καρπὸν ἀλλὰ παρ' ἔτος, τὰ μὲν νῦν τὰ δ' εἰς νέωτα, πεφυκότα ἀπὸ τῆς αὐτῆς ῥίζης. φιλεῖ δὲ ὀρεινὰ χωρία. ὁ δὲ καρπὸς αὐτοῦ καλεῖται κάρυον. ἀμῶσι δ' ὅταν ἀδρύνωνται αἱ κριθαὶ καὶ ξηραίνοντες καὶ ἀποκαθαίροντες· αὐτὸν τὸν καρπὸν πλύναντες ἐν ὕδατι καὶ πάλιν ξηράναντες διδόασι πιεῖν συμμιγνύντες δύο μέρη τῆς μελαίνης μήκωνος, τὸ δὲ συναμφότερον ὅσον ὀξύβαφον· καθαίρει δὲ φλέγμα κάτω· ἐὰν δὲ τὸ κάρυον αὐτὸ διδῶσι, τρίψαντες ἐν οἴνῳ γλυκεῖ διδόασιν ἢ ἐν σησάμῳ πεφρυγμένῳ κατατραγεῖν. ταῦτα μὲν οὖν τοῖς τε φύλλοις καὶ τοῖς ὀποῖς καὶ τοῖς καρποῖς χρήσιμα.

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[1] Plin. 26. 68.

[2] *κόκκινον* conj. W.; *κόκκος* MSS. *cf.* Plin. *l.c. ramis rubentibus.* [3] Diosc. 4. 164; Plin. 26. 62-65.

[4] *οὕτως ὡς δεῖ χρ.* conj. Sch.; *οὕτως ὡς δὴ χρ.* U*; *οὕτως χρ.* Ald.

Of the various kinds of tithymallos.

[1] Of the various plants called *tithymallos* (spurge) that which is called sea-spurge has a round scarlet[2] leaf; the stem (and the size of the plant generally) is about a span long, and the fruit is white. It is gathered when the grape is just turning, and the dried fruit is given in a draught, the dose being the twenty-fourth part of a pint.

[3] That which is called the 'male' has a leaf like the olive, and the height of the whole plant is a cubit. Of this they collect the juice at the time of vintage, and, after preparing it, use it as occasion demands[4]; and it purges chiefly downwards.

[5] The kind of *tithymallos* called 'myrtle-like' is white; it has a leaf like the myrtle, but spinous at the tip; it puts out earthward twigs about a span long, and these bear the fruit[6] not all at the same time but in alternate years, so that from the same root grow fruits partly this and partly next year. It loves hill-country. The fruit of it is called a 'nut.' They gather it when the barley is ripening and dry and clean it; (it is the actual fruit[7] which they clean); they wash it in water and, after drying it again, give it in a draught, mixing with it two parts of 'black[8] poppy'; and the whole dose amounts to about an eighth of a pint. It purges phlegm downwards. If they administer the 'nut' itself, they first pound it up in sweet wine, or give it in parched sesame to bite up. These plants then have leaves juices or fruits which are serviceable.

[5] Diosc. 4. 164; Plin. 26. 66. [6] *cf. C.P.* 4. 6. 9.

[7] W. adds δὲ after *αὐτὸν*. The treatment of the leaves has perhaps dropped out. *cf.* Plin. *l.c.* G's version is even shorter.

[8] *μέλαινα* must here mean 'dark,' *i.e.* red. See Index.

10 Τῶν δὲ λιβανωτίδων, δύο γάρ εἰσιν, ἡ μὲν ἄκαρπος ἡ δὲ κάρπιμος, ἡ μὲν καὶ τῷ καρπῷ καὶ τῷ φύλλῳ χρησίμη ἡ δὲ μόνον τῇ ῥίζῃ. καλεῖται δὲ ὁ καρπὸς κάχρυ. ἔχει δὲ αὕτη τὸ μὲν φύλλον ἐοικὸς σελίνῳ ἐλείῳ μεῖζον δὲ πολύ, καυλὸν δὲ μέγεθος πήχεως ἢ μείζω, ῥίζαν δὲ μεγάλην καὶ παχεῖαν λευκὴν ὄζουσαν ὥσπερ λιβανωτοῦ, καρπὸν δὲ λευκὸν τραχὺν προμήκη· φύεται δὲ μάλιστα ὅπου ἂν αὐχμηρὰ χωρία ᾖ καὶ πετρώδη· χρησίμη δὲ ἡ μὲν ῥίζα πρός τε τὰ ἕλκη καὶ πρὸς τὰ γυναικεῖα πινομένη ἐν οἴνῳ αὐστηρῷ μέλανι· ὁ δὲ καρπὸς πρός τε τὰς στραγγουρίας καὶ πρὸς τὰ ὦτα καὶ ἄργεμα καὶ πρὸς ὀφθαλμίας καὶ ὥστε γάλα γυναιξὶν ἐμποιεῖν.

11 Ἡ δὲ ἄκαρπος ἔχει τὸ φύλλον ὅμοιον θριδακίνης τῆς πικρᾶς τραχύτερον δὲ καὶ λευκότερον, ῥίζαν δὲ βραχεῖαν. φύεται δὲ ὅπουπερ ἐρείκη πλείστη. δύναται δὲ ἡ ῥίζα καθαίρειν καὶ ἄνω καὶ κάτω· τὸ μὲν γὰρ πρὸς τὴν βλάστην ἄνω, τὸ δὲ πρὸς τὴν γῆν κάτω· κωλύει δὲ καὶ εἰς ἱμάτια τιθεμένη τοὺς σῆτας. συλλέγεται δὲ περὶ πυροτομίας.

XII. Χαμαιλέων δὲ ὁ μὲν λευκὸς ὁ δὲ μέλας· αἱ δὲ δυνάμεις τῶν ῥιζῶν καὶ αὐταὶ δὲ αἱ ῥίζαι τοῖς εἴδεσι διάφοροι. τοῦ μὲν γὰρ λευκὴ καὶ παχεῖα καὶ γλυκεῖα καὶ ὀσμὴν ἔχουσα βαρεῖαν· χρήσιμον δέ φασι πρός τε τοὺς ῥοῦς, ὅταν ἐψηθῇ

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[1] Diosc. 3. 74; Plin. 19. 187.
[2] *cf.* Plin. 24. 99 and 101.
[3] *cf.* 7. 6. 2; 9. 9. 5.
[4] ὅπουπερ ἐρείκη conj. Dalec. etc. from Diosc. *l.c.*; ὅπουπερ εἴρηται Ald.H.; ὁπότε ἐρείκη U*.

Of the two herbs called libanotis.

[1]Of the plants called *libanotis*, (for there are two) one is barren, the other fruitful, the latter having both fruit and leaves that are serviceable, the former only a serviceable root. The fruit is called *kakhry*.[2] This plant has a leaf like marsh celery, but much larger, a stem a cubit long or more, a large stout white root, which smells like frankincense, and a white rough elongated fruit. It grows chiefly wherever there is parched and rocky soil; the root is serviceable for sores, and for diseases of women when given in a draught of dry black wine. The fruit is good for strangury, for the ears, for ulcers[3] on the eye, for ophthalmia and for producing milk in women.

The barren kind has a leaf like that of the bitter lettuce, but rougher and paler; the root is short. It grows where there is abundance of heather.[4] The root can purge both upwards and downwards, the upper part being used for the former, that nearer the ground for the latter purpose. Also, if it is put among clothes, it prevents moth. It is gathered at the time of wheat-harvest.

Of the two kinds of chamaeleon.

XII. [5]Of chamaeleon there is the white kind and the dark; the properties of the roots are different, and the roots also differ[6] in appearance. In the one case the root is white stout and sweet, and it has a heavy smell; they say that when cooked it is serviceable against flux; it is chopped up like

[5] Diosc. 3. 8; Plin. 22. 45 and 46, who explains the name (*mutat cum terra colores*). See Index.

[6] διαφέρουσαι conj. W.; διαφέρει U; διαφέρουσι δὲ M; διάφορον Ald.

κατατμηθεῖσα καθάπερ ῥαφανὶς ἐνειρομένη ἐφ ὁλοσχοίνου, καὶ πρὸς τὴν ἕλμινθα τὴν πλατεῖαν, ὅταν ἀσταφίδα προφάγῃ πίνειν ἐπιξέοντα ταύτην ὅσον ὀξύβαφον ἐν οἴνῳ αὐστηρῷ. ἀναιρεῖ δὲ καὶ κύνα καὶ σῦν· κύνα μὲν ἐν ἀλφίτοις ἀναφυραθεῖσα μετὰ ἐλαίου καὶ ὕδατος, σῦν δὲ μετὰ ῥαφάνων μεμιγμένη τῶν ὀρείων. γυναικὶ δὲ δίδοται ἐν τρυγὶ γλυκείᾳ ἢ ἐν οἴνῳ γλυκεῖ. καὶ ἐὰν βούληταί τις ἀσθενοῦντος ἀνθρώπου διαπειρᾶσθαι εἰ βιώσιμος, λούειν κελεύουσι τρεῖς ἡμέρας, κἂν περιενέγκῃ βιώσιμος. φύεται δὲ ὁμοίως παντα-χοῦ, καὶ ἔχει τὸ φύλλον ὅμοιον σκολύμῳ μεῖζον δέ· αὐτὸ δὲ πρὸς τῇ γῇ τινα κεφαλὴν ἔχει ἀκανοειδῆ μεγάλην, οἱ δὲ καὶ ἄκανον καλοῦσιν.

2 *Ὁ δὲ μέλας τῷ μὲν φύλλῳ παρόμοιος, σκολυμῶδες γὰρ ἔχει πλὴν ἔλαττον καὶ λειότερον, αὐτὸς δ' ὅλος ἐστὶν ὥσπερ σκιάδιον, ἡ δὲ ῥίζα παχεῖα καὶ μέλαινα διαρραγεῖσα δὲ ὑπόξανθος. χωρία δὲ φιλεῖ ψυχρὰ καὶ ἀργά· δύναται δὲ λέπραν τε ἐξελαύνειν ἐν ὄξει τριβόμενος καὶ ξυσθεὶς ἐπαλειφόμενος καὶ ἀλφὸν ὡσαύτως· ἀναιρεῖ δὲ καὶ τοὺς κύνας.*

3 *Μήκωνες δ' εἰσὶν ἄγριαι πλείους· ἡ μὲν κερατῖτις καλουμένη μέλαινα· ταύτης τὸ φύλλον ὥσ-*

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[1] *cf.* 9. 9. 1.

[2] *cf.* Pseudo-Diosc. 4. 175 and Index.

[3] ἀκανοειδῆ conj. Sch.; κονοειδῆ U*; κωνοειδῆ mP; ὁμοίαν ἀκανῷ PAld.

[4] δὲ after τὴν om. Sch.; ? τινα κεφαλὴν W.

radishes[1] and the pieces strung on a rush; it is also good against the broad maw-worm; the patient first eats a bunch of raisins and then drinks about an eighth of a pint of this scraped up in a draught of dry wine. It is fatal to dogs and pigs; to kill a dog it is well mixed up in a meal paste with oil and water, to kill a pig it is mixed with 'mountain cabbage' (spurge).[2] It is given to a woman in sweet wine-lees or sweet wine. And if one wishes to discover whether a man that is sick will recover, they say that he should be washed with this for three days, and, if he survives the experience, he will recover. It grows everywhere alike and has a leaf like the golden thistle, but larger; the plant itself has a large thistle-like[3] head[4] close to the ground; some actually[5] call it the thistle.

[6] The dark kind resembles the other in leaf, which is like that of the golden thistle but smaller and smoother; the plant itself is in general appearance like a sunshade; the root is stout and black, and when broken is yellowish. It likes cold uncultivated soil: it has the property of expelling leprosy; for this it is given pounded up in vinegar, or else scrapings of it are made into a plaster; and it is also used for the white leprosy. This plant is also fatal to dogs.[7]

Of the various plants called 'poppy.'

[8] There are several kinds of wild poppy: the one called the horned poppy is black: the leaf of this is

[5] δὲ καὶ ἄκανον I conj.; δ' ἄκανθαν U*mPar., so also Diosc. *l.c.*; δ' ἄκανον PAld.G.

[6] Diosc. 3. 9; Plin. *l.c.*

[7] κύνας: κυνορραΐστας, dog-ticks, conj. Reinesius from Plin. *ricinos canum.*

[8] Diosc. 4. 64; Plin. 20. 205 and 206.

περ φλόμου τῆς μελαίνης ἧττον δὲ μέλαν, τοῦ δὲ καυλοῦ τὸ ὕψος ὡς πηχυαῖον, ῥίζα δὲ παχεῖα καὶ ἐπιπόλαιος, ὁ δὲ καρπὸς καμπύλος ὥσπερ κεράτιον· συλλέγεται δὲ περὶ πυροτομίας. δύναται δὲ καθαίρειν κοιλίαν, τὸ δὲ φύλλον ἄργεμα προβάτοις ἀφαιρεῖν. φύεται δὲ παρὰ θάλατταν, οὗ ἂν ᾖ πετρώδη χωρία.

4 Ἑτέρα δὲ μήκων ῥοιὰς καλουμένη παρομοία κιχορίῳ τῷ ἀγρίῳ, δι' ὃ καὶ ἐσθίεται· ἐν τοῖς ἀρουραίοις δὲ φύεται, μάλιστα ἐν ταῖς κριθαῖς· ἄνθος δ' ἔχει ἐρυθρὸν κωδύαν δ' ὅσην ὄνυχα τοῦ δακτύλου. συλλέγεται δὲ πρὸ τοῦ θερισμοῦ τῶν κριθῶν, ἐγχλωροτέρα δὲ μᾶλλον. καθαίρει δὲ κάτω.

5 Ἑτέρα δὲ μήκων Ἡρακλεία καλεῖται τὸ μὲν φύλλον ἔχουσα οἷον στρουθός, ᾧ τὰ ὀθόνια λευκαίνουσι, ῥίζαν δὲ λεπτὴν ἐπιπόλαιον, τὸν δὲ καρπὸν λευκόν. ταύτης ἡ ῥίζα καθαίρει ἄνω· χρῶνται δέ τινες πρὸς τοὺς ἐπιλήπτους ἐν μελικράτῳ. ταῦτα μὲν οὖν ὥσπερ ὁμωνυμίᾳ τινὶ συνείληπται.

XIII. Τῶν δὲ ῥιζῶν καὶ ἐν τοῖς χυμοῖς αἱ διαφοραὶ καὶ ἐν ταῖς ὀσμαῖς· αἱ μὲν γάρ εἰσι δριμεῖαι αἱ δὲ πικραὶ αἱ δὲ γλυκεῖαι, καὶ αἱ μὲν εὔοδμοι αἱ δὲ βαρεῖαι. γλυκεῖα μὲν ἥ τε νυμφαία καλουμένη· φύεται δ' ἐν ταῖς λίμναις καὶ ἐν τοῖς ἑλώδεσιν, οἷον ἔν τε τῇ Ὀρχομενίᾳ καὶ Μαραθῶνι

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[1] ὥσπερ κεράτιον conj. W.; ὥσπερ κέρας UM; ὥσπερ τῶν κερατίων U*Ald.

[2] Diosc. *l.c.*; Plin. 19. 167–169.

[3] Diosc. 4. 66; Plin. 20. 207, *cf.* 19. 21.

like that of the black mullein, but it is not so black; the stem grows about a cubit high, the root is stout and shallow, the fruit is twisted like a little horn[1]: it is gathered at the time of wheat harvest. It has the property of purging the belly, and the leaf is used for removing ulcers on sheep's eyes. It grows by the sea, wherever there is rocky ground.

[2] Another kind of poppy is that called *rhoias*, which is like wild chicory, wherefore it is even eaten: it grows in cultivated fields and especially among barley. It has a red flower, and a head as large as a man's finger-nail. It is gathered before the barley-harvest, when it is still somewhat green. It purges downwards.

[3] Another kind of poppy is called *Herakleia*: it has a leaf like soap-wort, with which [4] they bleach linen: the root is slender and does not run deep, and the fruit is white. The root of this plant purges upwards: and some use it in a posset of mead for epileptics.

[5] These kinds then are distinct plants, though they come under one name.

Of roots possessing remarkable taste or smell.

XIII. The differences between roots are shown in their tastes [6] and in their smells: some are pungent, some bitter, some sweet: some again have a pleasant, others a disagreeable smell. The plant called yellow water-lily [7] is sweet: it grows in lakes and marshy places, as in the district of Orchomenus, at

[4] This appears to refer to *στρουθός*, not to *Ἡρακλεία*, as Plin. takes it. *cf.* 6. 4. 3 and Index, *στρούθιον* (2).

[5] *i.e.* *ῥοιάς* and *Ἡρακλεία* are popularly called 'poppies.' *ὁμωνυμίᾳ τινι* conj. W.; *ὁμώνυμα τινα* Ald.; *ὁμώνυμα τινι* U*. *cf.* 7. 15. 4.

[6] *χυμοῖς* conj. Sch.; *χυλοῖς* Ald. Plin. 25. 75.

καὶ περὶ Κρήτην· καλοῦσι δ' αὐτὴν οἱ Βοιωτοὶ μαδωνάϊν καὶ τὸν καρπὸν ἐσθίουσιν. ἔχει δὲ τὸ φύλλον μέγα ἐπὶ τοῦ ὕδατος· εἶναι δέ φασιν ἴσχαιμον, ἐὰν τρίψας τις ἐπὶ τὴν πληγὴν ἐπιθῇ·

2 χρησίμη δὲ καὶ πρὸς δυσεντερίαν πινομένη. Γλυκεῖα δὲ καὶ ἡ Σκυθική· καὶ ἔνιοι δὲ καλοῦσιν εὐθὺς γλυκεῖαν αὐτήν· γίνεται δὲ περὶ τὴν Μαιῶτιν· χρησίμη δὲ πρός τε τὰ ἄσθματα καὶ πρὸς τὴν βῆχα ξηρὰν καὶ ὅλως τοὺς περὶ τὸν θώρακα πόνους· ἔτι δὲ πρὸς τὰ ἕλκη ἐν μέλιτι· δύναται δὲ καὶ τὴν δίψαν παύειν, ἐάν τις ἐν τῷ στόματι ἔχῃ· δι' ὃ ταύτῃ τε καὶ τῇ ἱππακῇ διάγειν φασὶ τοὺς Σκύθας ἡμέρας καὶ ἕνδεκα καὶ δώδεκα.

3 [Ἡ δὲ ἀριστολοχία τῇ ὀσφρήσει μὲν εὔοδμος τῇ δὲ γεύσει πικρὰ σφόδρα τῇ χροιᾷ δὲ μέλαινα. φύεται δὲ ἐν τοῖς ὄρεσιν ἡ βελτίστη· φύλλον δὲ ἔχει προσεμφερὲς τῇ ἀλσίνῃ πλὴν στρογγυλότερον· χρησίμη δὲ πρὸς πολλά, καὶ ἀρίστη πρὸς κεφαλῆς ἀγαθὴ δὲ καὶ πρὸς τὰ ἄλλα ἕλκη, καὶ πρὸς τὰ ἑρπετὰ καὶ πρὸς ὕπνον καὶ πρὸς ὑστέραν. τὰ μὲν οὖν προσάγειν κελεύουσιν ἐν ὕδατι ἀναδεύσαντα καὶ καταπλάττοντα, τὰ δὲ ἄλλα εἰς μέλι ἐνξύσαντα καὶ ἔλαιον· πρὸς δὲ τὰ τῶν ἑρπετῶν ἐν οἴνῳ ὀξίνῃ πίνειν καὶ ἐπὶ τὸ δῆγμα ἐπιπλάττειν· εἰς ὕπνον δὲ ἐν οἴνῳ μέλανι αὐστηρῷ κνίσαι· ἐὰν δὲ αἱ μῆτραι προπέσωσι, τῷ ὕδατι ἀποκλύζειν.]

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[1] Diosc 3. 5; Plin. 25. 82.

[2] γλυκεῖαν : γλυκόρριζαν conj. Dalec., whence 'liquorice.' *cf.* Plin. 11. 284.

[3] *cf.* Plin. *l.c.*, who took ἱππακή to be a plant.

Marathon and in parts of Crete: the Boeotians, who eat the fruit, call it *madonaïs*. It has a large leaf which lies on the water: and it is said that it acts as a styptic if it is pounded up and put on the wound: it is also serviceable in the form of a draught for dysentery.

[1] 'Scythian root' (liquorice) is also sweet; some indeed call it simply 'sweet-root.' [2] It is found about Lake Maeotis: it is useful against asthma or a dry cough and in general for troubles in the chest: also, administered in honey, for wounds: also it has the property of quenching thirst, if one holds it in the mouth: wherefore they say that the Scythians, with the help of this and mares' milk cheese [3] can go eleven or twelve days without drinking.

[4] [Birthwort is fragrant to the smell but in taste is very bitter: in colour it is black. The best grows on the mountains: it has a leaf like *alsine*, but rounder: it is useful for many purposes, and is best for sores on the head [5] and other sores, also for bites of reptiles, for inducing sleep and for disorders of the womb.[6] It is directed that it should be applied as a plaster, steeped in water, and for the other purposes should be given shredded into honey and olive-oil: for snake-bites it should be taken in sour wine and also used as a plaster on the bite: to induce sleep it should be scraped up [7] and administered in black dry wine; in cases of *prolapsus uteri* a lotion of it mixed with water should be applied.]

[4] Diosc. 3. 4; Plin. 25. 95. This section is repeated 9. 20. 4. with considerable variations: that seems to be its proper place.

[5] *κεφαλῆς* conj. W.; *κεφαλὴν* Ald. *cf.* § 20, *κεφαλόθλαστα.*

[6] *ὑστέραν* conj. W., *cf.* below, *ἐὰν δὲ αἱ μῆτραι κ.τ.λ.* and the duplicate passage § 20; *ἕτερα* MSS.

[7] *κνίσαι* conj. W.; *κνίσας* U*Ald.

4 Αὗται μὲν οὖν γλυκεῖαι. ἄλλαι δὲ πικραί, αἱ δὲ βαρεῖαι τῇ γεύσει. γίνονται δέ τινες τῶν γλυκειῶν αἱ μὲν ἐκστατικαί, καθάπερ ἡ ὁμοία τῷ σκολύμῳ περὶ Τέγεαν, ἣν καὶ Πάνδειος ὁ ἀνδριαντοποιὸς φαγὼν ἐργαζόμενος ἐν τῷ ἱερῷ ἐξέστη. αἱ δὲ θανατηφόροι, καθάπερ ἡ περὶ τὰ μέταλλα ἐν τοῖς ἔργοις τοῖς ἐν Θράκῃ· κούφη δὲ καὶ ἡδεῖα πάνυ τῇ γεύσει καὶ τὸν θάνατον ὑπνώδη τινὰ ποιοῦσα καὶ ἐλαφρόν. ἔχουσι δὲ καὶ τοῖς χρώμασι διαφορὰς οὐ τῷ λευκῷ καὶ μέλανι καὶ ξανθῷ μόνον, ἀλλ᾽ ἔνιαι καὶ οἰνοχρῶτες, αἱ δ᾽ ἐρυθραί, καθάπερ ἡ τοῦ ἐρευθεδανοῦ.

5 Ἡ δὲ τοῦ πενταφύλλου ἢ πενταπετοῦς, καλοῦσι γὰρ ἀμφοτέρως, ὀρυττομένη ἐρυθρὰ ξηραινομένη δὲ μέλαινα γίνεται καὶ τετράγωνος· ἔχει δὲ τὸ φύλλον ὥσπερ οἴναρον μικρὸν δὲ καὶ τὴν χροιὰν ὅμοιον· καὶ αὐξάνεται καὶ φθίνει ἅμα τῇ ἀμπέλῳ· πάντα δὲ πέντε τὰ φύλλα, δι᾽ ὃ καὶ ἡ προσηγορία· καυλοὺς δὲ ἐπὶ γῆν ἵησι λεπτοὺς καὶ κνήμας ἔχει.

6 Τὸ δὲ ἐρευθεδανὸν φύλλον ὅμοιον κιττῷ πλὴν στρογγυλότερον· φύεται δ᾽ ἐπὶ γῆς ὥσπερ ἄγρωστις, φιλεῖ δὲ παλίσκια χωρία. οὐρητικὴ δέ, δι᾽ ὃ καὶ χρῶνται πρὸς τὰ τῆς ὀσφύος ἀλγήματα καὶ πρὸς τὰς ἰσχιάδας.

Ἔνιαι δὲ ἰδιόμορφοί τινες, ὥσπερ ἥ τε τοῦ σκορπίου καλουμένου καὶ ἡ τοῦ πολυποδίου. ἡ

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[1] These words shew that § 3 is out of place.
[2] *cf. C.P.* 6. 4. 5.
[3] ἡ conj. Sch.; αἱ U*Ald.
[4] ἐν τοῖς ἔργοις τοῖς W. from U*. ? a gloss on μέταλλα. τὰ μετ. τὰ ἐν Θ. Ald. H.
[5] Plin. 25. 139.

[1] These then are sweet: other roots are bitter, and some unpleasant to the taste. Of those that are sweet [2] there are some that cause mental derangement, as the plant like the golden thistle which grows near Tegea: of this Pandeios the sculptor ate, and went mad while he was working in the temple. Others have fatal effects, as that [3] which grows near the mines in the fields of [4] Thrace: this however is inoffensive and quite sweet to the taste, and the death which it causes is easy and like falling asleep. There are also differences in colour, not merely as to being black or white or yellow, but some are quite wine-coloured and some are red, as the root of madder.

[5] The root of *pentaphyllon* or *pentapetes* (cinquefoil) [6] (for the plant bears both names) is red when it is dug up, but as it dries it becomes black and square: its leaf is like a vine-leaf, and it is small and like it in colour: it grows and fades along with the vine. It only has five leaves in all, whence its name: it sends out long slender stems on the ground, and it has joints.[7]

[8] Madder has a leaf like ivy, but it is rounder: it grows along the ground like dog's-tooth grass and loves shady spots. It has diuretic properties, wherefore it is used for pains in the loins or hip-disease.

Some roots are of peculiar shape, as that of the plant called 'scorpion-plant' (leopard's bane) [9] and that of polypody. For the former is like a scorpion

[6] *πενταπετοῦς* conj. Sch.; *πενταπέτου* UAld.; *πεντεπέτου* M U*. *cf.* Diosc. 4. 42.

[7] *καὶ κνήμας ἔχει* U*; *και κν. ἐ. πυκνάς* Ald.; *καὶ κνίκας ἔχει πυκνάς* UM. *cf.* *πολύκνημος*, Diosc. 3. 94. Text probably defective, as nothing is said of the plant's medicinal use.

[8] Diosc. 3. 143; Plin. 19. 47.

[9] *cf.* 9. 18. 2.

μὲν γὰρ ὁμοία σκορπίῳ καὶ χρησίμη δὲ πρὸς τὴν πληγὴν αὐτοῦ καὶ πρὸς ἄλλ' ἄττα. ἡ δὲ τοῦ πολυποδίου δασεῖα καὶ ἔχουσα κοτυληδόνας, ὥσπερ αἱ τοῦ πολύποδος πλεκτάναι. καθαίρει δὲ κάτω· κἂν περιάψηταί τις οὔ φασιν ἐμφύεσθαι πολύπουν. ἔχει δὲ φύλλον ὅμοιον τῇ πτερίδι τῇ μεγάλῃ καὶ φύεται ἐν ταῖς πέτραις.

XIV. Πασῶν δὲ τῶν ῥιζῶν αἱ μὲν πλείω χρόνον αἱ δὲ ἐλάττω διαμένουσιν. ὁ μὲν γὰρ ἑλλέβορος καὶ τριάκοντα ἔτη χρήσιμος, ἡ δὲ ἀριστολοχία πέντε ἢ ἕξ, χαμαιλέων δὲ ὁ μέλας τετταράκοντα, κενταυρὶς δὲ δέκα ἢ δώδεκα· πίειρα δὲ ἡ ῥίζα καὶ πυκνή· πευκέδανον δὲ πέντε ἢ ἕξ, ἀμπέλου δὲ ἀγρίας ἐνιαυτόν, ἐὰν ἐν σκιᾷ ᾖ καὶ ἄπληκτος, εἰ δὲ μή, σαπρὰ καὶ σομφώδης· ἄλλαι δὲ ἄλλους ἔχουσαι χρόνους. πάντων δὲ ὅλως τῶν φαρμάκων πλεῖστον διαμένει χρόνον τὸ ἐλατήριον, καὶ τὸ παλαιότατον ἄριστον. ἰατρὸς δ' οὖν τις ἔλεγεν οὐκ ἀλαζὼν οὐδὲ ψεύστης ὡς εἴη παρ' αὐτῷ καὶ διακοσίων ἐτῶν θαυμαστὸν δὲ τῇ
2 ἀρετῇ, δοῦναι δὲ αὐτῷ τινα δῶρον. αἰτία δὲ τῆς χρονιότητος ἡ ὑγρότης· διὰ γὰρ ταύτην καὶ ὅταν κόψωσι τιθέασι εἰς τέφραν ὑγρόν, καὶ οὐδ' ὡς γίνεται ξηρόν, ἀλλ' ἄχρι πεντήκοντα ἐτῶν σβέννυσι προσαγομενον τοὺς λύχνους. φασὶ δὲ μόνον

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[1] *cf.* the mediaeval doctrine of 'signatures.'
[2] Diosc. 4. 186.
[3] *τις οὐ* conj. Sch.; *τις ὡς* Ald.; *τίς* UM; *τίς ὥς* U*.
[4] Plin. 27. 143. [5] *cf.* 9. 8. 7. [6] *cf* 9. 20. 3.
[7] *ἄπληκτος*: ? by worms. *cf. ἄκοπος.*

and is also useful[1] against the sting of that creature and for certain other purposes. [2]The root of polypody is rough and has suckers like the tentacles of the polyp. It purges downwards: and, if one wears it as an amulet, they say that one[3] does not get a polypus. It has a leaf like the great fern, and it grows on rocks.

Of the time for which roots can be kept without losing their virtue.

XIV. [4]Some roots keep a longer, some a shorter time. Hellebore retains its usefulness for as much as thirty years, birthwort five or six, the black chamaeleon for forty, feverwort[5] (whose root is thick and compact) for ten or twelve. Sulphur-wort keeps five or six years, the root of the 'wild vine'[6] (bryony) for a year, if it be kept in the shade and not damaged:[7] otherwise it rots and becomes spongy.[8] Others keep for various periods. But, to speak generally, of all plants used as drugs the 'driver'[9] keeps longest, and, the older it is, the better it is. At least a certain physician, who was no boaster nor liar, said that he had some which was 200 years old and of marvellous virtue, and that it was a present to him from some one. The cause of its keeping so long is its moisture: [10]for to secure this, as soon as they have cut it, they put it among ashes without drying it, and not even so does it become dry, but up to fifty years it will put the lamp[11] out if it is brought near it. And they say that alone of all

[8] *σομφώδης* conj. Sch.; *σογκώδης* Ald.H.
[9] A manufactured drug. *cf.* 9. 9. 4.
[10] Diosc. 4. 150; Plin. 20. 5.
[11] *λύχνους* conj Sch.: so Vin.Cod.Cas.GPlin. *l.c.*; *αὐχμοὺς* U*Ald.; *χρόνους* UM.

ἢ μάλιστα ὑπέρινον ἄνω ποιεῖν τῶν φαρμάκων· αὕτη μὲν οὖν ἰδιότης τις δυνάμεως.

3 Τῶν δὲ ῥιζῶν ὅσαι μὲν γλυκύτητά τινα ἔχουσι ξυμβαίνει θριπηδέστους γίνεσθαι χρονιζομένας, ὅσαι δὲ δριμεῖαι, τοῦτο μὲν μὴ πάσχειν ἀμαυροῦσθαι δ' αὐτῶν τὰς δυνάμεις μανουμένων καὶ κενουμένων. τῶν δ' ἔξω θηρίων ἄλλο μὲν οὐδὲν ἅπτεται ῥίζης δριμείας, ἡ δὲ σφονδύλη πασῶν· τοῦτο μὲν οὖν ἴδιον τῆς τοῦ ζώου φύσεως.

4 Πᾶσαν δὲ χείρω γίνεσθαι ῥίζαν, ἐὰν ἐάσῃ τις τελειωθῆναι καὶ ἀδρυνθῆναι τὸν καρπόν· ὡσαύτως δὲ καὶ τὸν καρπόν, ἐὰν ὀπίσῃς τὴν ῥίζαν· ὡς ἐπὶ τὸ πολὺ δὲ αἱ φαρμακώδεις οὐκ ὀπίζονται, ὧν δ' ἂν τὰ σπέρματα φαρμακώδη, αὗται δὴ ὀπίζονται· χρῆσθαι δέ τινές φασι μᾶλλον ταῖς ῥίζαις, ὅτι ἰσχυρότερος ὁ καρπὸς ὥσθ' ὑπενεγκεῖν τὸ σῶμα. φαίνεται δὲ οὐ καθ' ὅλου τοῦτο ἀληθές· ἐπεὶ καὶ οἱ ἐν Ἀντικύρᾳ τοῦ σησαμώδους [ἐλλεβόρου] διδόασιν, [ὅτι ὁ καρπὸς ὅμοιος σησάμῳ].

XV. Φαρμακώδεις δὲ δοκοῦσιν εἶναι τόποι μάλιστα τῶν μὲν ἔξω τῆς Ἑλλάδος οἱ περὶ τὴν Τυρρηνίαν καὶ τὴν Λατίνην, ἐν ᾗ καὶ τὴν Κίρκην εἶναι λέγουσιν· καὶ ἔτι μᾶλλόν γε, ὡς Ὅμηρός

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[1] Plin. 27. 143.
[2] *i.e.* not engendered in the root.
[3] A beetle? *cf.* Arist. *H.A.* 5. 8.
[4] This section is omitted in U*. Plin. 27. 144.

drugs, or to a greater degree than any, it effects a thorough purge upwards: this then is a virtue peculiar to it.

Those roots which contain any sweetness become worm-eaten in course of time, but those that are pungent are not so affected, though their virtues diminish as they become flabby and waste away. [1] No creature coming from without [2] touches a pungent root, but the *sphondyle* [3] attacks them all; this then is a peculiarity of this creature.

[4] Any root, they say, deteriorates if one lets the fruit grow to maturity and ripen: and so in like manner does the fruit, if you drain the root of its juice: and in general roots with medicinal properties do not have the juice of their roots taken, and only those whose seeds are medicinal are thus treated. But some say that they use the roots for choice, because the fruit is too powerful for the human body to be able to bear it. However this does not appear to be true as a universal rule, seeing that the people of Anticyra administer [5] doses of the drug [6] *sesamodes* made from hellebore, which is so called because its fruit is like sesame.

Of the localities which specially produce medicinal herbs.

XV. The places outside Hellas which specially produce medicinal herbs seem to be the parts of Tyrrhenia and Latium (where they say that Circe dwelt), and still more parts of Egypt, as Homer says:

[5] *i.e.* and it is in this case the *fruit* which is used. The drug in question, as well as the plant, was called σησαμοειδές or σησαμοειδής. *cf.* 9. 9. 2 n.; Diosc. 4. 149.

[6] Or (if ἐλλεβόρου is sound) 'of the sesame-like hellebore,' *i.e.* he 'black.' ὅτι . . . σησάμῳ I have bracketed, as a gloss on σησαμώδους: ἐλλεβόρου is probably also a gloss.

φησι, τὰ περὶ Αἴγυπτον· ἐκεῖθεν γὰρ τὴν Ἑλένην φησὶ λαβεῖν "ἐσθλὰ τά οἱ Πολύδαμνα πόρεν Θῶνος παράκοιτις Αἰγυπτίη· τόθι πλεῖστα φύει ζείδωρος ἄρουρα φάρμακα, πολλὰ μὲν ἐσθλὰ τετυγμένα πολλὰ δὲ λυγρά." ὧν δὴ καὶ τὸ νηπενθὲς ἐκεῖνό φησιν εἶναι καὶ ἄχολον, ὥστε λήθην ποιεῖν καὶ ἀπάθειαν τῶν κακῶν. καὶ σχεδὸν αὗται μὲν ἐοίκασιν ὥσπερ ὑπὸ τῶν ποιητῶν ὑποδεδεῖχθαι. καὶ γὰρ Αἰσχύλος ἐν ταῖς ἐλεγείαις ὡς πολυφάρμακον λέγει τὴν Τυρρηνίαν· "Τυρρηνὸν γενεάν, φαρμακοποιὸν ἔθνος."

2 Οἱ δὲ τόποι πάντες πως φαίνονται μετέχειν τῶν φαρμάκων, ἀλλὰ [τῷ μᾶλλον καὶ ἧττον διαφέρειν· καὶ γὰρ οἱ πρὸς ἄρκτον καὶ μεσημβρίαν καὶ οἱ πρὸς ἀνατολὰς ἔχουσι θαυμαστὰς δυνάμεις. ἐν Αἰθιοπίᾳ γὰρ ᾗ τοὺς ὀϊστοὺς χρίουσι ῥίζα τίς ἐστι θανατηφόρος. ἐν δὲ Σκύθαις αὕτη τε καὶ ἕτεραι πλείους, αἱ μὲν παραχρῆμα ἀπαλλάττουσαι τοὺς προσενεγκαμένους, αἱ δ' ἐν χρόνοις αἱ μὲν ἐλάττοσιν αἱ δ' ἐν πλείοσιν, ὥστ' ἐνίους καταφθίνειν. ἐν Ἰνδοῖς δὲ καὶ ἕτερα γένη πλείω, περιττότατα δέ, εἴπερ ἀληθῆ λέγουσιν, ἥ τε δυναμένη τὸ αἷμα διαχεῖν καὶ οἷον ὑποφεύγειν, καὶ πάλιν ἡ συνάγουσα καὶ πρὸς ἑαυτὴν ἐπισπωμένη, ἃ δή φασιν εὑρῆσθαι πρὸς τὰ τῶν ὀφιδίων θανατηφόρων δήγματα.

3 Περὶ δὲ τὴν Θρᾴκην εἶναι μὲν καὶ ἑτέρας οὐκ ὀλίγας, ἰσχυροτάτην δὲ ὡς εἰπεῖν τὴν ἴσχαιμον, ἣν δὴ λέγουσιν οἱ μὲν κεντηθείσης τῆς φλεβὸς

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[1] *Od.* 4. 221 foll.

[2] ὧν δὴ conj. Sch.; ωί δὴ U*; ἐν οἷς δὴ PAld.

for thence he says[1] that Helen brought "things of virtue which Polydamna, the Egyptian wife of Thon, gave her; there the grain-bearing earth produces most drugs, many that are good, and many baneful." Among these[2] he says was *nepenthes*, the famous drug which cures sorrow and passion, so that it causes forgetfulness and indifference to ills. So these lands seem to have been pointed out, as it were, by the poets. For Aeschylus too in his elegies speaks of Tyrrhenia as rich in drugs, for he tells of the "Tyrrhenian stock, a nation that makes drugs."

It seems that almost all places take their share in producing drugs, but that they differ in the extent to which they do so; for the regions of the North, South, and East have herbs of marvellous virtue. Thus in Ethiopia there is a certain deadly root[3] with which they smear their arrows. And in Scythia there is this and there are also others, some of which kill at once those who eat them, some after an interval, shorter or longer, so that in the latter case men have a lingering death. In India there are many other kinds,[4] but the most extraordinary,[5] if they tell the truth, are these: there is one which has the power to make the blood disperse and as it were to put it to flight,[6] and another which collects it and draws it to itself; these they say were discovered as remedies for the bites of deadly serpents.

In Thrace it is said there are fairly numerous other kinds, but that about the most powerful is 'blood-stancher,'[7] which stops and prevents the flow

[3] Somali arrow-poison. Index App. (27).
[4] *γένη* conj. Dalec.; *μέρη* Ald.
[5] *περιττότατα* conj. W.; *περιττοτάτη* Ald.
[6] ? add *ποιεῖν* after *ὑποφεύγειν*. [7] Plin. 25. 83.

οἱ δὲ καὶ σφοδροτέρως διατμηθείσης ἴσχειν καὶ κωλύειν τὴν χύσιν. [ταῦτα μὲν οὖν, ὥσπερ εἴπομεν, ἔοικε δηλοῦν τὸ κοινόν.] τῶν μὲν οὖν ἔξω τόπων οἱ φαρμακωδέστατοι οὗτοι.

4 Τῶν δὲ περὶ τὴν Ἑλλάδα τόπων φαρμακωδέστατον τό τε Πήλιον τὸ ἐν Θετταλίᾳ καὶ τὸ Τελέθριον τὸ ἐν Εὐβοίᾳ καὶ ὁ Παρνασός, ἔτι δὲ καὶ ἡ Ἀρκαδία καὶ ἡ Λακωνική· καὶ γὰρ αὗται φαρμακώδεις ἀμφότεραι· διὸ καὶ οἵ γε Ἀρκάδες εἰώθασιν ἀντὶ τοῦ φαρμακοποτεῖν γαλακτοποτεῖν περὶ τὸ ἔαρ, ὅταν οἱ ὀποὶ μάλιστα τῶν τοιούτων φύλλων ἀκμάζωσι· τότε γὰρ φαρμακωδέστατον τὸ γάλα· πίνουσι δὲ βόειον· δοκεῖ γὰρ πολυνομώτατον καὶ παμφαγώτατον εἶναι πάντων ὁ βοῦς.

5 Φύεται δὲ παρ' αὐτοῖς ὅ τε ἐλλέβορος ἀμφότερος καὶ ὁ λευκὸς καὶ ὁ μέλας· ἔτι δὲ δαῦκον δαφνοειδὲς κροκόεν, καὶ ἦν ἐκεῖνοι μὲν ῥάφανον ἀγρίαν καλοῦσι τῶν δ' ἰατρῶν τινες κεράϊν, καὶ ἦν οἱ μὲν ἀλθαίαν ἐκεῖνοι δὲ μαλάχην ἀγρίαν, καὶ ἡ ἀριστολοχία καὶ τὸ σέσελι καὶ τὸ ἱπποσέλινον καὶ τὸ πευκέδανον καὶ ἡ Ἡράκλεια καὶ ὁ στρύχνος ἀμφότερος ὅ τε φοινικοῦν ἔχων τὸν καρπὸν καὶ ὁ μέλανα.

6 Φύεται δὲ καὶ ὁ σίκυος ὁ ἄγριος, ἐξ οὗ τὸ ἐλατήριον συντίθεται· καὶ ὁ τιθύμαλλος, ἐξ οὗ τὸ ἱπποφάες· ἄριστον δὲ τοῦτο περὶ Τεγέαν κἀκεῖνο μάλιστα σπουδάζεται· φύεται δ' ἐκεῖ ἐπὶ πλέον·

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[1] I omit *ταῦτα . . . κοινόν* as apparently out of place and a duplicate of the last sentence of § 8.

[2] Plin. 25. 94; *cf.* 4. 5. 2. [3] Plin. 25. 110.

of blood, some say if the vein is merely pricked, others even if it is deeply cut into.[1] These then of the places outside Hellas are those that are most productive of drugs.

[2] Of places in Hellas those most productive of drugs are Pelion in Thessaly, Telethrion in Euboea, Parnassus, and also Arcadia and Laconia, for both these states produce medicinal herbs; wherefore the Arcadians are accustomed, instead of drinking medicine, to drink milk in spring when the juices of such plants are at their best, for then the milk has most medicinal virtue. It is cows' milk that they drink, since it appears that the cow eats more than any other animal and is more impartial as to what she eats.

[3] Both kinds of hellebore, the white and the black, grow in their country, and also carrot,[4] a saffron-coloured plant like bay, and a plant which the Arcadians call 'wild cabbage'[5] (spurge) but some physicians *keraïs*; also a plant called by some marsh mallow,[6] also birthwort hartwort alexanders sulphurwort *Herakleia*, and both kinds of *strykhnos*,[7] that which has a scarlet and that which has a black fruit.

There also grow there the 'wild cucumber' (squirting cucumber), of which the drug 'driver'[8] is compounded, and the *tithymallos* (spurge) of which *hippophaës*[9] is made; this is best about Tegea, and that kind is much sought after; it grows there in

[4] δαῦκον. This name recurs §8 and 9. 20. 2. Text must be defective here: the epithets are unintelligible, and perhaps belong to another plant whose name has dropped out. See Index.

[5] *cf.* 9. 12. 1. and Index.

[6] ἀλθαίαν conj. Sch., *cf.* 9. 18. 1; ἀλθέαν Ald. *cf.* Plin. 20. 222.

[7] *cf.* 9. 11. 5. [8] *cf.* 9. 9 4; 9. 14. 1.

[9] ἱπποφάες is elsewhere the name of a plant: *cf.* Diosc. 4. 159. ἐξ οὗ may be corrupt, or the text defective.

πλεῖστον δὲ καὶ κάλλιστον φύεται περὶ τὴν Κλειτορίαν.

7 Ἡ δὲ πανάκεια γίνεται κατὰ τὸ πετραῖον περὶ Ψωφίδα καὶ πλείστη καὶ ἀρίστη. τὸ δὲ μῶλυ περὶ Φενεὸν καὶ ἐν τῇ Κυλλήνῃ. φασὶ δ' εἶναι καὶ ὅμοιον ᾧ ὁ Ὅμηρος εἴρηκε, τὴν μὲν ῥίζαν ἔχον στρογγύλην προσεμφερῆ κρομύῳ τὸ δὲ φύλλον ὅμοιον σκίλλῃ· χρῆσθαι δὲ αὐτῷ πρός τε τὰ ἀλεξιφάρμακα καὶ τὰς μαγείας· οὐ μὴν ὀρύττειν γ' εἶναι χαλεπόν, ὡς Ὁμηρός φησι.

8 Τὸ δὲ κώνειον ἄριστον περὶ Σοῦσα καὶ ἐν τοῖς ψυχροτάτοις τόποις. γίνεται δὲ καὶ ἐν τῇ Λακωνικῇ τὰ πολλὰ τούτων· καὶ γὰρ αὕτη πολυφάρμακος. ἐν Ἀχαίᾳ δὲ ἥ τε τραγάκανθα πολλὴ καὶ οὐδὲν χείρων ὡς οἴονται τῆς Κρητικῆς ἀλλὰ καὶ τῇ ὄψει καλλίων· καὶ δαῦκον περὶ τὴν Πατραϊκὴν διαφέρον· τοῦτο δὲ θερμαντικὸν φύσει, ῥίζαν δὲ ἔχει μέλαιναν. φύεται δὲ τὰ πολλὰ τούτων καὶ ἐν τῷ Παρνασῷ καὶ περὶ τὸ Τελέθριον. καὶ ταῦτα μὲν κοινὰ πλειόνων χώρων.

XVI. Τὸ δὲ δίκταμνον ἴδιον τῆς Κρήτης, θαυμαστὸν δὲ τῇ δυνάμει καὶ πρὸς πλείω χρήσιμον μάλιστα δὲ πρὸς τοὺς τόκους τῶν γυναικῶν. ἔστι δὲ τὸ μὲν φύλλον παρόμοιον τῇ βληχοῖ, ἔχει δέ τι καὶ κατὰ τὸν χυλὸν ἐμφερὲς τὰ δὲ κλωνία λεπτότερα. χρῶνται δὲ τοῖς φύλλοις, οὐ τοῖς κλωσὶν οὐδὲ τῷ καρπῷ· χρήσιμον δὲ πρὸς πολλὰ μὲν καὶ ἄλλα, μάλιστα δέ, ὥσπερ ἐλέχθη, πρὸς

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[1] Plin. 25. 30–33. [2] κατὰ conj. St.; καὶ Ald.H.
[3] Plin. 25. 151.
[4] Σοῦσα: *cf.* 9. 16. 8; Λοῦσα (a town in Arcadia) conj. Sch. (usually Λοῦσοι), the other places mentioned being all in

considerable abundance, but in greatest abundance and best about Kleitoria.

[1] All-heal grows in great abundance and best in [2] the rocky ground about Psophis, moly about Pheneos and on Mount Kyllene. They say that this plant is like the moly mentioned by Homer, that it has a round root like an onion and a leaf like squill, and that it is used against spells and magic arts, but that it is not, as Homer says, difficult to dig up.

[3] Hemlock is best about Susa [4] and in the coldest spots. Most of these plants occur also in Laconia, for this too is a land rich in medicinal herbs. In Achaia tragacanth [5] is abundant and is as good as that of Crete, it is believed, and even fairer in appearance. *Daukon* [6] again is excellent in the country about Patrai [7]; this is by nature healing, and it has a black root. Most of these grow also on Mount Parnassus and about Telethrion. So these plants are common to several lands.

Of the medicinal herbs peculiar to Crete.

XVI. [8] But dittany is peculiar to Crete. This plant is marvellous in virtue and is useful for many purposes, but especially for women in child-birth. Its leaf is like pennyroyal, to which it also bears some resemblance in taste; but the twigs are slenderer. They use the leaves, not the twigs nor the fruit: and the leaf is useful for many other purposes, but above all,

Hellas. But Plin. 25. 154 has Susa: it can hardly be the Persian town.

[5] Plin. 13. 115.

[6] Repeated 9. 20. 2; *cf.* 9. 15. 5 and Index.

[7] Πατραΐκὴν conj. Sch., *cf.* 9. 20. 2; πατρικὴν Ald.; σπαρτιακὴν U*; σπαρτικὴν MP; *Patrensi agro* G.

[8] Plin. 25. 92.

τὰς δυστοκίας τῶν γυναικῶν· ἢ γὰρ εὐτοκεῖν φασι ποιεῖν ἢ παύειν γε τοὺς πόνους ὁμολογουμένως· δίδοται δὲ πίνειν ἐν ὕδατι. σπάνιον δέ ἐστι· καὶ γὰρ ὀλίγος ὁ τόπος ὁ φέρων, καὶ τοῦτον αἱ αἶγες ἐκνέμονται διὰ τὸ φιληδεῖν. ἀληθὲς δέ φασιν εἶναι καὶ τὸ περὶ τῶν βελῶν, ὅτι φαγούσαις ὅταν τοξευθῶσι ἐκβάλλει. τὸ μὲν οὖν δίκταμνον τοιοῦτόν τε καὶ τοιαύτας ἔχει τὰς δυνάμεις.

2 Τὸ δὲ ψευδοδίκταμνον τῷ μὲν φύλλῳ ὅμοιον τοῖς κλωνίοις δ' ἔλαττον τῇ δυνάμει δὲ πολὺ λειπόμενον. βοηθεῖ μὲν γὰρ καὶ ταὐτά, χεῖρον δὲ πολλῷ καὶ ἀσθενέστερον. ἔστι δὲ εὐθὺς ἐν τῷ στόματι φανερὰ τοῦ δικτάμνου ἡ δύναμις· διαθερμαίνει γὰρ ἀπὸ μικροῦ σφόδρα. τιθέασι δὲ τὰς δεσμίδας ἐν νάρθηκι ἢ καλάμῳ πρὸς τὸ μὴ ἀποπνεῖν· ἀσθενέστερον γὰρ ἀποπνεῦσαν. λέγουσι δέ τινες ὡς ἡ μὲν φύσις μία ἡ τοῦ δικτάμνου καὶ ἡ τοῦ ψευδοδικτάμνου, διὰ δὲ τὸ ἐν εὐγειοτέροις φύεσθαι τόποις χεῖρον γίνεσθαι, καθάπερ καὶ ἄλλα πολλὰ πλείω τούτων κατὰ τὰς δυνάμεις. τὸ γὰρ δίκταμνον φιλεῖ χώραν τραχεῖαν.

3 Ἔστι δὲ καὶ ἕτερον δίκταμνον ὥσπερ ὁμώνυμον, οὔτε τὴν ὄψιν οὔτε τὴν δύναμιν ἔχον τὴν αὐτήν· φύλλον γὰρ ἔχει ὅμοιον σισυμβρίῳ τοὺς δὲ κλῶνας μείζους· ἔτι δὲ τὴν χρείαν καὶ τὴν δύναμιν οὐκ ἐν τοῖς αὐτοῖς. τοῦτο μὲν οὖν, ὥσπερ ἐλέχθη, θαυμαστὸν ἅμα καὶ ἴδιον τῆς νήσου. φασὶ δέ

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[1] ἐκβάλλει conj. Sch.; ἐκβάλλειν Ald.

[2] Plin. 25. 93.

[3] νάρθηκι ἢ conj Sch.; ναρθηκίδη ἢ U; ναρθηκίδι ἢ M; νάρθηκι καὶ Ald.

as was said, against difficult labour in women; for it is said that either it makes labour quite easy or at least it confessedly makes the pains to cease: it is given as a draught in water. It is a scarce plant: for the region which bears it is not extensive, and the goats graze it down because they are fond of it. The story of the arrows is also said to be true,—that, if goats eat it when they have been shot, it rids them [1] of the arrow. Such then is dittany and such its properties.

[2] 'False dittany' is like it in leaf, but has smaller twigs, and in virtue is far inferior. For it is of service in the same ways, but is feebler and not nearly so powerful. The virtue of dittany is perceived directly it is taken into the mouth: for a small piece of it has a very warming effect. The bunches of it are put in the hollow stem of ferula [3] or a reed, so that it may not exhale its virtue: for, if it does so, it is less effective. Some say that dittany and 'false dittany' are essentially the same plant, but that the latter is an inferior form produced by growing in places with richer soil; just as many other things [4] become inferior in their properties for the same cause. For dittany loves rough ground.

[5] There is also another plant called 'dittany,' though it has nothing in common with these except the name. This has neither the same appearance nor the same virtue; for its leaf is like bergamot-mint and its twigs are larger, and further its use and virtue are differently shewn. The true plant is, as was said, marvellous, and is also peculiar to the island of Crete. Indeed some say that the plants

[4] πλείω τούτων Ald., probably a duplicate of ἄλλα πολλὰ; not represented in G; ἀλλοιοῦται conj. W. [5] Plin. 25. 94.

τινες ὅλως τῶν φύλλων καὶ τῶν ὀροδάμνων καὶ ἁπλῶς τῶν ὑπὲρ γῆς τὰ ἐν Κρήτῃ διαφέρειν, τῶν δὲ ἄλλων τῶν γε πλείστων τὰ ἐν τῷ Παρνασῷ.

4 Τὸ δ' ἀκόνιτον γίνεται μὲν καὶ ἐν Κρήτῃ καὶ ἐν Ζακύνθῳ, πλεῖστον δὲ καὶ ἄριστον ἐν Ἡρακλείᾳ τῇ ἐν Πόντῳ. ἔχει δὲ φύλλον μὲν κιχοριῶδες, ῥίζαν δὲ ὁμοίαν τῷ σχήματι καὶ τῷ χρώματι καρίδι, τὴν δὲ δύναμιν τὴν θανατηφόρον ἐν ταύτῃ· τὸ δὲ φύλλον καὶ τὸν καρπὸν οὐθέν φασι ποιεῖν· καρπὸς δέ ἐστι πόας οὐχ ὑλήματος. βραχεῖα δὲ ἡ πόα καὶ οὐδὲν ἔχουσα περιττόν, ἀλλὰ παρομοία τῷ σίτῳ τὸ δὲ σπέρμα οὐ σταχυηρόν. φύεται δὲ πανταχοῦ καὶ οὐκ ἐν ταῖς Ἀκόναις μόνον, ἀφ' ὧν ἔχει τὴν προσηγορίαν· αὕτη δέ ἐστι κώμη τις τῶν Μαριανδυνῶν· φιλεῖ δὲ μάλιστα τοὺς πετρώδεις τόπους· οὐ νέμεται δὲ οὔτε πρόβατον οὔτ' ἄλλο
5 ζῶον οὐδέν. συντίθεσθαι δὲ τρόπον τινὰ πρὸς τὸ ἐργάζεσθαι καὶ οὐ παντὸς εἶναι· δι' ὃ καὶ τοὺς ἰατροὺς οὐκ ἐπισταμένους συντιθέναι σηπτικῷ τε χρῆσθαι καὶ πρὸς ἄλλα ἄττα· πινόμενον δ' οὐδεμίαν αἴσθησιν ποιεῖν οὔτ' ἐν οἴνῳ οὔτ' ἐν μελικράτῳ· συντίθεσθαι δὲ ὥστε κατὰ χρόνους τακτοὺς ἀναιρεῖν, οἷον δίμηνον τρίμηνον ἑξάμηνον ἐνιαυτόν, τοὺς δὲ καὶ δύο ἔτη· χείριστα δὲ ἀπαλ-

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[1] ὀροδάμνων: this word seems to occur only here in T.
[2] Diosc. 4. 76 and 77; Plin. 27. 9 and 10.
[3] καρίδι conj. W.; καρίαι U; καρύα Ald. *cf.* Diosc. *l.c.*
[4] *cf.* 9. 8. 1.
[5] Plin. 6. 4, *portus Acone veneno aconito dirus.* But in 27. 10. he apparently did not recognise Ἀκόναις as a proper name,

of Crete are superior in leaves boughs[1] and in general all the parts above ground to those of other places; while those of Parnassus are superior to most of those found elsewhere.

Of wolf's-bane and its habitat, and of meadow-saffron.

[2] Wolf's-bane grows in Crete and in Zakynthos, but is most abundant and best at Herakleia in Pontus. It has a leaf like chicory, a root like in shape and colour to a prawn,[3] and in this root resides its deadly property, whereas they say that the leaf and the fruit produce no effects. The fruit is that of a herb,[4] not that of a shrub or tree. It is a low-growing herb and shows no special feature, but is like corn, except that the seed is not in an ear. It grows everywhere and not only at Akonai,[5] from whence it gets its name (this is a village of the Mariandynoi)[6]: and it specially likes rocky ground. Neither sheep nor any other animals eat it.[7] In order to be effective it is said that it must be compounded in a certain manner, and that not everyone can do this: and so that physicians, not knowing how to compound it, use it as a septic and for other purposes: and[8] that, if drunk mixed in wine or a honey-posset, it produces no sensation: but that it can be so compounded as to prove fatal at a certain moment which may be in two three or six months, or in a year, or even in two years: and that the

and translates it *in nudis cautibus*, misled perhaps by *τοὺς πετρώδεις τόπους* below.

[6] *Μαριανδυνῶν* conj. Meurs.; *περιανδύνων* U*Ald.H.

[7] U* adds here *βοηθεῖαι δὲ τοῖς ἐνεγκαμένοις εἰσί* and omits §§ 5, 6 . . . *εἰδέναι*, continuing *πυλλάκις γὰρ φασὶ τὰ ἀνδράποδα.*

[8] *δὲ* add. Sch.

λάττειν τοὺς ἐν πλείστῳ χρόνῳ καταφθίνοντος τοῦ σώματος, ῥᾷστα δὲ τοὺς παραχρῆμα. λυτικὸν δὲ φάρμακον οὐχ εὑρῆσθαι, καθάπερ ἀκούομεν ἑτέρων τι φύεσθαι. ἀλλὰ τοὺς ἐγχωρίους ἀνασώζειν τινὰς μέλιτι καὶ οἴνῳ καὶ τοιούτοις τισί, σπανίως δὲ καὶ τούτους καὶ ἐργωδῶς.

6 Ἀλλὰ τοῦ ἐφημέρου τὸ φάρμακον εὑρῆσθαι· ἕτερον γάρ τι ῥίζιον εἶναι ὃ ἐφήμερον ἀπαλλάττει· τοῦτο δὲ φύλλον ὅμοιον ἔχειν τῷ ἐλλεβόρῳ ἢ τῷ λειρίῳ· καὶ τοῦτο πάντας εἰδέναι· δι' ὃ καὶ τὰ ἀνδράποδά φασι πολλάκις παροργισθέντα χρῆσθαι, κἄπειτα ἰατρεύειν αὐτὰ πρὸς τοῦτο ὁρμῶντα, καὶ γὰρ οὐδὲ ταχεῖαν ποιεῖσθαι τὴν ἀπαλλαγὴν οὐδὲ ἐλαφρὰν ἀλλὰ δυσχερῆ καὶ χρόνιον· εἰ μὴ ἄρα διὰ τὸ εὐθεράπευτον εἶναι καὶ ἀκατασκεύαστον ὡς δεῖ. φασὶ γοῦν καὶ παραχρῆμα ἀπαλλάττεσθαι καὶ ὕστερον χρόνῳ τοὺς δὲ καὶ εἰς ἐνιαυτὸν ἄγειν, καὶ τὰς δόσεις ἀβοηθήτους εἶναι.

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[1] *i.e.* no *herb* having that effect.

[2] *ἑτέρων* conj. Sch.; *ἕτερόν τι φύεσθαι* UAld.H.; *ἕτερόν τι φυόμενον* conj. W. G seems to have had a fuller text.

[3] *ἀλλὰ τοὺς ἐγχ.* UM; *ἀλλά τινες τοῖς ἐνεγκαμένοις βοήθειαι εὕρηνται· τοὺς γὰρ ἐγχ.* Ald.H., which the indicative *εὕρηνται* shews to be a gloss.

[4] *τοῦ ἐφημέρου* U; *τὰ ἐφ' ἡμέρου* M; *καὶ τὸ ἐφήμερον* Ald. The passage about *ἐφήμερον*, which interrupts the account of *ἀκόνιτον*, is confused, and the text probably defective; translation a makeshift. The sense of *εἰ μὴ . . . ὡς δεῖ* being perhaps irrecoverable, the connexion of what follows is obscured. W. gives up the passage.

longer the time the more painful the death, since the body then wastes away, while, if it acts at once, death is quite painless. And it is said that no antidote [1] which can counteract it has been discovered, like the natural antidotes to other [2] poisonous herbs of which we are told: though the country-folk [3] can sometimes save a man with honey and wine and such like things, only however occasionally and with difficulty.

(On the other hand they say that for meadow-saffron [4] the antidote has been found: for that there is another root which counteracts that herb: [5] and that it [6] has a leaf like hellebore [7] or the madonna lily: [8] and that this [9] is generally known. Wherefore they say that slaves often take meadow-saffron when greatly provoked, and then themselves have recourse [10] to the antidote and effect a cure,—seeing that the poison does not cause a speedy and easy death, but [11] one that is lingering and slow,—unless indeed, merely because the cure is so easy,[12] the antidote has not been properly prepared.[13] At least they say that though death may ensue at once, sometimes it only occurs after a considerable interval, which in some cases extends to a year, and that in these latter cases the dose given has incurable effects: and that

[5] ὃ *ἐφήμερον* PH.; *ὁ ἐφημεραῖον* U; *ὁ ἐφ' ἡμεραῖον* M; *ὁ οὐκ ἐφήμερον* Ald.

[6] *τοῦτο δὲ* Ald.; *τόνδε δὲ καὶ* U; *τῶνδε δὲ καὶ* M.

[7] *i.e.* the 'black': see Index.

[8] λειρίῳ conj. Guilandinus from Diosc. 4. 84 (*κρίνῳ*); *αἰρίῳ* Ald. H.

[9] *τοῦτο* Ald.; *τοῦτο μὲν* UM.

[10] After *ὁρμῶντα* UM add *καὶ τοὺς οἰκέτας ἐπὶ τοῦτο ὁρμᾶν* and omit *καὶ γὰρ . . . θανατηφόρων.*

[11] *ἀλλὰ* Ald.; *οὐδὲ* U*.

[12] *εὐθεράπευτον* Ald.; *ἀθεράπευτον* U*P.

[13] In which case apparently the slave outwits himself as well as his master by 'dying on him.'

ταῦτα δὲ ἐξακριβωθῆναι μάλιστα παρὰ τοῖς Τυρ-
7 ρηνοῖς τοῖς ἐν Ἡρακλείᾳ. τοῦτο μὲν <οὖν>[1] οὐδὲν ἄτοπον, εἰ τρόπον μέν τινα ἀβοήθητον ἄλλως δὲ βοηθήσιμον, ὥσπερ καὶ ἕτερα τῶν θανατηφόρων.

Τὸ δὲ ἀκόνιτον ἄχρηστον, ὥσπερ εἴρηται, τοῖς μὴ ἐπισταμένοις· οὐδὲ κεκτῆσθαι δὲ ἐξεῖναι, ἀλλὰ θάνατον τὴν ζημίαν· τὴν δὲ τῶν χρόνων διαφορὰν ἀκολουθεῖν[2] κατὰ τὰς συλλογάς· ἰσοχρόνους γὰρ τοὺς θανάτους γίνεσθαι τοῖς ἀπὸ τῆς συλλογῆς χρόνοις.

8 Θρασύας δ' ὁ Μαντινεὺς εὑρήκει τι τοιοῦτον, ὥσπερ ἔλεγεν, ὥστε ῥᾳδίαν ποιεῖν καὶ ἄπονον τὴν ἀπόλυσιν τοῖς ὀποῖς χρώμενος κωνείου τε καὶ μήκωνος καὶ ἑτέρων τοιούτων, ὥστε εὔογκον εἶναι σφόδρα καὶ μικρὸν ὅσον εἰς δραχμῆς ὁλκήν. ἀβοήθητον δὲ πάντη καὶ δυνάμενον διαμένειν ὁποσονοῦν χρόνον καὶ οὐδὲν ἀλλοιούμενον. ἐλάμβανε δὲ τὸ κώνειον οὐχ ὅθεν ἐτύγχανεν ἀλλ' ἐκ Σούσων καὶ εἴ τις ἄλλος τόπος ψυχρὸς καὶ παλίσκιος· ὡσαύτως δὲ καὶ τἆλλα. συνετίθει δὲ καὶ ἕτερα φάρμακα πολλὰ καὶ ἐκ πολλῶν. δεινὸς δὲ καὶ Ἀλεξίας ὁ μαθητὴς αὐτοῦ καὶ οὐχ ἧττον ἔντεχνος ἐκείνου· καὶ γὰρ τῆς ἄλλης ἰατρικῆς ἔμπειρος.

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[1] οὖν add. W.

[2] ἀκολουθεῖν κατὰ conj. W.; ἀκούειν εἶναι κατὰ Ald. H.; ἀκουεῖν εἶναι καὶ M.

these facts have been most carefully ascertained among the Tyrrhenians of Herakleia. Now[1] it is not surprising that in some circumstances the effects of the poison should be incurable, and yet in others that a cure should be possible, this being also the case with other deadly poisons.)

To return—wolf's bane, as has been said, is useless to those who do not understand it; in fact it is said that it is not lawful even to have it in one's possession, under pain of death; also that the length of time which it takes to produce its effects depends on[2] the time when it is gathered; for that the time which it takes to kill is equal to that which has elapsed since it was gathered.

Of two famous druggists and of the virtues of hemlock.

Thrasyas of Mantineia had discovered, as he said, a poison which produces an easy and painless end; he used the juices of hemlock poppy and other such herbs, so compounded as to make a dose of conveniently small size, weighing only somewhat less than a quarter of an ounce. For the effects of this compound there is absolutely no cure, and it will keep any length of time without losing its virtue at all. He used to gather his hemlock, not just anywhere, but at Susa[3] or some other cold and shady spot; and so too with the other ingredients; he also used to compound many other poisons, using many ingredients. His pupil Alexias was also clever and no less skilful than his master, being also versed in the science of medicine generally.

[3] Σούσων MSS.; Λούσων conj. Sch. *cf.* 9. 15. 8 n. The mention of Mantineia makes it likely that a place in Arcadia is intended.

9 Ταῦτα μὲν οὖν εὑρῆσθαι δοκεῖ πολλῷ μᾶλλον νῦν ἢ πρότερον. ὅτι δὲ διαφέρει τὸ χρῆσθαί πως ἑκάστῳ φανερὸν ἐκ πολλῶν· ἐπεὶ καὶ Κεῖοι τῷ κωνείῳ πρότερον οὐχ οὕτω ἀλλὰ τρίβοντες ἐχρῶντο, καθάπερ οἱ ἄλλοι· νῦν δ' οὐδ' ἂν εἷς τρίψειεν, ἀλλὰ περιπτίσαντες καὶ ἀφελόντες τὸ κέλυφος, τοῦτο γὰρ τὸ τὴν δυσχέρειαν παρέχον δυσκατέργαστον[1] ὄν, μετὰ ταῦτα κόπτουσιν ἐν τῷ ὅλμῳ καὶ διαττήσαντες[2] λεπτὰ ἐπιπάττοντες ἐφ' ὕδωρ πίνουσιν, ὥστε ταχεῖαν καὶ ἐλαφρὰν γίνεσθαι τὴν ἀπαλλαγήν.

XVII. Ἁπάντων δὲ τῶν φαρμάκων αἱ δυνάμεις ἀσθενέστεραι τοῖς συνειθισμένοις τοῖς δὲ καὶ ἀνενεργεῖς τὸ ὅλον. ἔνιοι γὰρ ἐλλέβορον ἐσθίοντες πολὺν ὥστε ἀναλίσκειν δέσμας ὅλας οὐδὲν πάσχουσιν· ὅπερ ἐποίει καὶ Θρασύας δεινότατος ὢν ὡς ἐδόκει περὶ τὰς ῥίζας. ποιοῦσι δὲ τοῦθ' ὡς ἔοικε καὶ τῶν νομέων τινές· δι' ὃ καὶ πρὸς τὸν φαρμακοπώλην τὸν θαυμαζόμενον ὡς κατήσθιε ῥίζαν μίαν ἢ δύο παραγενόμενος ὁ ποιμὴν καὶ ἀναλώσας ὅλην τὴν δέσμην ἐποίησεν ἀδόκιμον· ἐλέγετο δ' ὅτι καθ' ἑκάστην ἡμέραν τοῦτο ποιεῖ καὶ αὐτὸς καὶ ἕτεροι.

2 Κινδυνεύει γὰρ ἔνια τῶν φαρμάκων τῇ ἀσυνηθείᾳ φάρμακα γίνεσθαι, τάχα δὲ ἀληθέστερον

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[1] δυσκατέργαστον: *cf. C.P.* 1 14. 4.

[2] διαττήσαντες conj. Hoffmann from G; διαπτήσαντες Ald. H.; διηθήσαντες U*mP.

Now these things seem to have been ascertained far better in recent than in former times. And many things go to shew that the method of using the various drugs makes a difference; thus the people of Ceos formerly did not use hemlock in the way described, but just shredded it up for use, as did other people; but now not one of them would think of shredding it, but they first strip off the outside and take off the husk, since this is what causes the difficulty, as it is not easily assimilated[1]; then they bruise it in the mortar, and, after putting it through a fine sieve,[2] sprinkle it on water and so drink it; and then death is made swift and easy.

How use diminishes the efficacy of drugs, and how they have not the same effect on all constitutions.

XVII. [3]The virtues of all drugs become weaker to those who are accustomed to them, and in some cases become entirely ineffective. Thus some eat enough hellebore to consume whole bundles and yet suffer no hurt; this is what Thrasyas did, who, as it appeared, was very cunning in the use of herbs. And it appears that shepherds sometimes do the like; wherefore the shepherd who came before the vendor of drugs (at whom men marvelled because he ate one or two roots) and himself consumed the whole bundle, destroyed the vendor's reputation: it was said that both this man and others did this every day.

For it seems that some poisons become poisonous because they are unfamiliar, or perhaps it is a more accurate way of putting it to say that familiarity makes

[3] Plin. 27. 144.

εἰπεῖν ὡς τῇ συνηθείᾳ οὐ φάρμακα· προσδεξαμένης γὰρ τῆς φύσεως καὶ κατακρατούσης οὐκέτι φάρμακα, καθάπερ καὶ Θρασύας ἔλεγεν· ἐκεῖνος γὰρ ἔφη τὸ αὐτὸ τοῖς μὲν φάρμακον εἶναι τοῖς δ' οὐ φάρμακον, διαιρῶν τὰς φύσεις ἑκάστων· ᾤετο γὰρ δεῖν καὶ ἦν δεινὸς διαγνῶναι. ποιεῖ δέ τι δῆλον ὅτι πρὸς τῇ φύσει καὶ τὸ ἔθος. Εὔδημος γοῦν ὁ φαρμακοπώλης εὐδοκιμῶν σφόδρα κατὰ τὴν τέχνην συνθέμενος μηδὲν πείσεσθαι πρὸ ἡλίου δύναντος κατέφαγε μέτριον πάνυ καὶ οὐ
3 κατέσχεν οὐδ' ἐκράτησεν. ὁ δὲ Χῖος Εὔδημος πίνων ἐλλέβορον οὐκ ἐκαθαίρετο. καί ποτε ἔφη πιεῖν ἐν μιᾷ ἡμέρᾳ δύο καὶ εἴκοσι πόσεις ἐν τῇ ἀγορᾷ καθήμενος ἐπὶ τῶν σκευῶν καὶ οὐκ ἐξαναστῆναι πρὸ τοῦ δεῖλην γενέσθαι· τότε δ' ἐλθὼν καὶ λούσασθαι καὶ δειπνεῖν ὥσπερ εἰώθει καὶ οὐκ ἐξεμέσαι· πλὴν οὗτός γε βοήθειάν τινα παρασκευασάμενος κατέσχε· κίσσηριν γὰρ ἐπιπάττων ἐπ' ὄξος δριμὺ πιεῖν ἔφη μετὰ τὴν ἑβδόμην πόσιν, καὶ πάλιν ὕστερον ἐν οἴνῳ τὸν αὐτὸν τρόπον· τὴν δὲ τῆς κισσήριδος οὕτως ἰσχυρὰν εἶναι δύναμιν ὥστ' ἐάν τις εἰς πίθον ζέοντα <οἶνου> ἐμβάλῃ παύειν τὴν ζέσιν οὐ παραχρῆμα μόνον ἀλλὰ καὶ ὅλως καταξηραίνουσάν τε δῆλον ὅτι καὶ ἀναδεχομένην τὸ πνεῦμα καὶ τοῦτο διιεῖσαν. οὗτος μὲν οὖν τό γε πλῆθος ταύτῃ τῇ βοηθείᾳ κατέσχεν.
4 Ὅτι δὲ καὶ τὸ ἔθος ἰσχυρὸν φανερὸν ἐκ πολλῶν·

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[1] This story is quoted by Apollonius, *Hist. Mirab.* 50.

poisons non-poisonous; for, when the constitution has accepted them and prevails over them, they cease to be poisons, as Thrasyas also remarked; for he said that the same thing was a poison to one and not to another; thus he distinguished between different constitutions, as he thought was right; and he was clever at observing the differences. Also, besides the constitution, it is plain that use has something to do with it. At least Eudemus, the vendor of drugs, who had a high reputation in his business, after making a wager that he would experience no effect before sunset, drank a quite moderate dose, and it proved too strong for his power of resistance: [1] while the Chian Eudemus took a draught of hellebore and was not purged. And on one occasion he said that in a single day he took two and twenty draughts in the market-place as he sat at his stall, and did not leave the place till it was evening, and then he went home and had a bath and dined, and was not sick. However this man was able to hold out because he had provided himself with an antidote; for he said that after the seventh dose he took a draught of tart vinegar with pumice-stone dust in it, and later on took a draught of the same in wine in like manner; and that the virtue of the pumice-stone dust is so great that, if one puts it into a boiling pot of wine,[2] it causes it to cease to boil, not merely for the moment, but altogether, clearly because it has a drying effect and it catches the vapour and passes it off. It was then by this antidote that Eudemus was able to contain himself in spite of the large quantity of hellebore which he took.

However many things go to show that use makes

[2] *οἴνου* add. Sch., *cf.* Plin. 36. 42; 14. 138.

ἐπεὶ καὶ τὸ ἀψίνθιον τὰ μὲν ἐνταῦθα πρόβατα οὔ φασί τινες νέμεσθαι, τὰ δ' ἐν τῷ Πόντῳ νέμεται καὶ γίνεται πιότερα καὶ καλλίω καί, ὡς δή τινες λέγουσιν, οὐκ ἔχοντα χολήν. ἀλλὰ γὰρ ταῦτα μὲν ἑτέρας ἄν τινος εἴη θεωρίας.

XVIII. Αἱ δὲ ῥίζαι καὶ τὰ ὑλήματα, καθάπερ εἴρηται, πολλὰς ἔχουσι δυνάμεις οὐ πρὸς τὰ ἔμψυχα σώματα μόνον ἀλλὰ καὶ πρὸς τὰ ἄψυχα. λέγουσι γὰρ ἄκανθάν τινα εἶναι ἣ πήγνυσι τὸ ὕδωρ ἐμβαλλομένη· πηγνύναι δὲ καὶ τὴν τῆς ἀλθαίας ῥίζαν, ἐάν τις τρίψας ἐμβάλῃ καὶ θῇ ὑπαίθριον· ἔχει δὲ ἡ ἀλθαία φύλλον μὲν ὅμοιον τῇ μαλάχῃ πλὴν μεῖζον καὶ δασύτερον, τοὺς δὲ καυλοὺς μαλακούς, ἄνθος δὲ μήλινον, καρπὸν δ' ὅμοιον τῇ μαλάχῃ, ῥίζαν δὲ ἰνώδη λευκὴν τῇ γεύσει δὲ ὥσπερ τῆς μαλάχης ὁ καυλός· χρῶνται δὲ αὐτῇ πρός τε τὰ ῥήγματα καὶ τὰς βῆχας ἐν οἴνῳ γλυκεῖ καὶ ἐπὶ τὰ ἕλκη ἐν ἐλαίῳ.

2 Ἑτέραν δέ τινα συνεψομένην τοῖς κρέασι συνάπτειν εἰς ταὐτὸ καὶ οἷον πηγνύναι· τὰς δὲ καὶ ἕλκειν, ὥσπερ ἡ λίθος καὶ τὸ ἤλεκτρον. καὶ ταῦτα μὲν ἐν τοῖς ἀψύχοις.

Τὸ δὲ θηλύφονον, οἱ δὲ σκορπίον καλοῦσι διὰ τὸ τὴν ῥίζαν ὁμοίαν ἔχειν τῷ σκορπίῳ, ἐπιξυό-

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[1] *cf.* Plin. 27. 45.

[2] ὑλήματα: here a general term for shrubs and under-shrubs. *cf.* 9. 20. 6.

[3] Diosc. 3. 146; Plin. 20. 84.

much difference; [1] thus some say that the sheep of some places do not eat wormwood; yet those of Pontus not only eat it but become fatter and fairer and, as some say, have no bile. But these things may be said to belong to a different enquiry.

Of plants that possess properties affecting lifeless objects.

XVIII. Herbs and shrubs,[2] as has been said, have many virtues which are shown in their effects not only on living bodies but on lifeless ones. Thus they say that there is a kind of *akantha* (gum arabic) which thickens water, when it is put in it; [3] and that so also does the root of marsh-mallow if one shreds it and puts it in and stands the water in the open air. Marsh-mallow has a leaf like mallow, but larger and rougher; the stems are soft, the flower yellow, the fruit like that of mallow, the root fibrous and white, with a taste like that of the stem of mallow. They use it for fractures and for coughs in sweet wine, and for sores in olive-oil.

[4] They say that there is another kind which, if cooked with meat, combines with it and as it were sets it hard; and there are others that attract things to them, like the magnet or amber. So much for effects produced on lifeless things.

Of plants whose properties affect animals other than man.

[5] Wolf's bane, which some call 'scorpion-plant because it has a root like a scorpion, kills that animal

[4] Referred to by Apollon. *Hist. Mirab.* 41. *cf.* Diosc. 3. 147; Plin. 27. 42; 25. 67.

[5] Referred to by Ael. *H.A.* 9. 27; Apollon. *Hist. Mirab.* 41. *cf.* Plin. 25. 122 (*cf.* 27. 6); Diosc. 4. 76. This is evidently a different plant to the *σκορπίος* mentioned 9. 13. 6. See Index.

μενον ἀποκτείνει τὸν σκορπίον· ἐὰν δέ τις ἐλλέβορον λευκὸν καταπάσῃ, πάλιν ἀνίστασθαί φασιν· ἀπόλλυσι δὲ καὶ βοῦς καὶ πρόβατα καὶ ὑποζύγια καὶ ἁπλῶς πᾶν τετράπουν ἐὰν εἰς τὰ αἰδοῖα τεθῇ ἡ ῥίζα ἢ τὰ φύλλα αὐθήμερον· χρήσιμον δὲ πρὸς σκορπίου πληγὴν πινόμενον. ἔχει δὲ τὸ μὲν φύλλον ὅμοιον κυκλαμίνῳ τὴν δὲ ῥίζαν, ὥσπερ ἐλέχθη, σκορπίῳ. φύεται δὲ ὥσπερ ἡ ἄγρωστις καὶ γόνατα ἔχει· φιλεῖ δὲ χωρία σκιώδη. εἰ δὲ ἀληθῆ τὰ περὶ τὸν σκορπίον ἤδη καὶ τἄλλα, οὐκ ἀπίθανα τὰ τοιαῦτα. καὶ τὰ

3 *μυθώδη δὲ οὐκ ἀλόγως συγκεῖται. ἐν δὲ τοῖς ἡμετέροις σώμασι χωρὶς τῶν πρὸς ὑγείαν καὶ νόσον καὶ θάνατον καὶ πρὸς ἄλλα δυνάμεις ἔχειν φασὶν οὐ μόνον τῶν σωματικῶν ἀλλὰ καὶ τῶν τῆς ψυχῆς. . . . .*

XIX. *Πρὸς δὲ τὴν ψυχὴν τὸν μὲν στρύχνον ὥστε παρακινεῖν καὶ ἐξιστάναι, καθάπερ ἐλέχθη πρότερον, ἡ δὲ τοῦ ὀνοθήρα ῥίζα δοθεῖσα ἐν οἴνῳ πραότερον καὶ ἱλαρώτερον ποιεῖ τὸ ἦθος. ἔχει δὲ ὁ μὲν ὀνοθήρας τὸ μὲν φύλλον ὅμοιον ἀμυγδαλῇ μικρότερον δέ, τὸ δὲ ἄνθος ἐρυθρὸν ὥσπερ ῥόδον· αὐτὸς δὲ μέγας θάμνος· ῥίζα δὲ ἐρυθρὰ καὶ μεγάλη, ὄζει δὲ αὐανθείσης ὥσπερ οἴνου· φιλεῖ δὲ ὀρεινὰ χωρία. φαίνεται δὲ οὐ τοῦτο ἄτοπον· οἷον γὰρ προσφορά τις γίνεται δύναμιν ἔχοντος οἰνώδη.*

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[1] *σκορπίῳ* conj. W.; *σκορπίου* Ald.

[2] 18. 3, *λέγω δὲ σωματικῶν* . . . 18. 11 (the account of the physical effects) is here omitted.

[3] 9. 11. 6.

if it is shredded over him ; while if one then sprinkles him with white hellebore, they say that he comes to life again. It is also fatal to oxen sheep beasts of burden and in general to any fourfooted animal, and kills them the same day if the root or leaf is put on the genitals ; and it is also useful as a draught against a scorpion's sting. It has a leaf like cyclamen, and a root, as was said, like a scorpion.[1] It grows like dog's-tooth grass, and is jointed, and it loves shady places. Now if what has been told already about the scorpion be true, then other similar tales are not incredible. (Indeed fabulous tales are not composed without some reason).[2] And in relation to our own persons, apart from their effects in regard to health disease and death, it is said that herbs have also other properties affecting not only the bodily but also the mental powers. . . . .

Of plants possessing properties which affect the mental powers.

XIX. As to those which affect the mind, *strykhnos*, as was said before,[3] is said to upset the mental powers and make one mad ; [4] while the root of *onotheras* (oleander) administered in wine makes the temper gentler and more cheerful. This plant has a leaf like the almond, but smaller,[5] and the flower is red like a rose. The plant itself (which loves hilly country) forms a large bush ; the root is red and large, and, if this is dried, it gives off a fragrance like wine. And this does not seem surprising, since there is a sort of 'bouquet' given off by a thing which has the peculiar quality of wine.

[4] Diosc. 4. 117 ; Plin. 26. 111.

[5] *μικρότερον* conj. W. ; *πικρότερον* UM ; *πλατύτερον* Ald. (so also Diosc. *l.c.*). G seems to have read *μακρότερον*.

2 Ἀλλὰ τάδε εὐηθέστερα καὶ ἀπιθανώτερα τά τε τῶν περιάπτων καὶ ὅλως τῶν ἀλεξιφαρμάκων λεγομένων τοῖς τε σώμασι καὶ ταῖς οἰκίαις. καὶ ὡς δή φασι τὸ τριπόλιον καθ' Ἡσίοδον καὶ Μουσαῖον εἰς πᾶν πρᾶγμα σπουδαῖον χρήσιμον εἶναι, δι' ὃ καὶ ὀρύττουσιν αὐτὸ νύκτωρ σκηνὴν πηξάμενοι. καὶ τὰ περὶ τῆς εὐκλείας δὲ καὶ εὐδοξίας ὁμοίως ἢ καὶ μᾶλλον· εὔκλειαν γάρ φασι ποιεῖν τὸ ἀντίρρινον καλούμενον· τοῦτο δ' ὅμοιόν ἐστι τῇ ἀπαρίνῃ· ῥίζα δὲ οὐχ ὕπεστιν· ὁ δὲ καρπὸς ὥσπερ μόσχου ῥῖνας ἔχει. τὸν δ' ἀπὸ
3 τούτου ἀλειφόμενον εὐδοξεῖν. εὐδοξεῖν δὲ καὶ ἐάν τις τοῦ ἐλειοχρύσου τῷ ἄνθει στεφανῶται μύρῳ ῥαίνων ἐκ χρυσίου ἀπύρου. ἔχει δὲ ὁ ἐλειόχρυσος τὸ μὲν ἄνθος χρυσοειδές, φύλλον δὲ λευκὸν καὶ τὸν καυλὸν δὲ λεπτὸν καὶ σκληρὸν ῥίζαν δὲ ἐπιπόλαιον καὶ λεπτήν. χρῶνται δὲ αὐτῷ πρὸς τὰ δακετὰ ἐν οἴνῳ καὶ πρὸς τὰ πυρίκαυστα κατακαύσαντες καὶ μίξαντες μέλιτι. τὰ μὲν οὖν τοιαῦτα, καθάπερ καὶ πρότερον ἐλέχθη, συναύξειν βουλομένων ἐστὶ τὰς ἑαυτῶν τέχνας.

4 Αἱ δὲ τῶν ῥιζῶν καὶ τῶν καρπῶν καὶ τῶν ὀπῶν φύσεις ἐπεὶ πολλὰς ἔχουσι καὶ παντοίας δυνάμεις, ὅσαι ταὐτὸ δύνανται καὶ τῶν αὐτῶν αἰτίαι,

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[1] ἀπιθανώτερα conj. Scal. after G: so also Cod. Cas. Vin. Vo.; πιθανώτερα U*; πιθανότερα Ald.

[2] τριπόλιον UMU*Ald.; G from Plin. 21. 44 has *polium*. It may be observed that τριπόλιον can hardly have occurred in a hexameter. Hesych., however, gives τρισπόλιον as the name

Of plants said to have magical properties.

On the other hand what is said of amulets and charms in general for the body or the house is somewhat foolish and incredible.[1] Thus they say that *tripolion*[2] according to Hesiod and Musaeus is useful for every good purpose, wherefore they dig it up by night, camping on the spot. So too what is said of good or fair fame as affected by plants is quite as foolish or more so: for they say that the plant called snapdragon[3] produces fair fame. This plant is like bedstraw but it has no root: and the fruit has what resembles a calf's nostrils. The man who anoints himself with this they say wins fair fame. [4] And they say that the same result follows, if he crowns himself with the flower of gold-flower, sprinkling it with unguent from a vessel of unfired gold. The flower of gold-flower is like gold, the leaf is white. The stem also is white [5] and hard, the root is slender and does not run deep. [6] Men use it in wine against the bites of serpents, and to make a plaster for burns after burning it and mixing the ashes with honey. Such tales then, as was said before, proceed from men who desire to glorify their own crafts.

A problem as to cause and effect.

Now since the natural qualities of roots fruits and juices have many virtues of all sorts, some having the same virtue and causing the same result, while

of a plant. Plin. *l.c.* seems to combine Diosc.'s account of πόλιον (3. 110) with his account of τριπόλιον (4. 132).

[3] τὸ ἀντίρρινον conj. St. from Diosc. 4. 130; Plin. 25. 129; τὸ ἀντίρριζον Ald. H.; τὸν ἀντ. UM; τὸ ἀντίριζον U*.

[4] Diosc. 4. 57; Plin. 21. 66. Cited also by Athen. 15. 27.

[5] λευκὸν conj. Sch.; λεπτὸν UMU*Ald.G.

[6] Diosc. *l.c.*; Plin. 21. 168 and 169.

καὶ πάλιν ὅσαι τὰ ἐναντία, διαπορήσειεν ἄν τις κοινὸν ἴσως ἀπόρημα καὶ ἐφ' ἑτέρων ἀπόρων, πότερον ὅσα τῶν αὐτῶν αἴτια κατὰ μίαν τινὰ δύναμίν ἐστιν, ἢ καὶ ἀφ' ἑτέρων ἐνδεχεται ταὐτὸ γίνεσθαι. τοῦτο μὲν οὖν ταύτῃ ἠπορήσθω· εἰ δέ τινων καὶ ἄλλων τὰς φύσεις ἢ τὰς δυνάμεις ἔχομεν εἰπεῖν, ταῦτα ῥητέον.

XX. Τὸ δὴ πέπερι καρπὸς μέν ἐστι διττὸν δὲ αὐτοῦ τὸ γένος· τὸ μὲν γὰρ στρογγύλον ὥσπερ ὄροβος, κέλυφος ἔχον καὶ σάρκα καθάπερ αἱ δαφνίδες, ὑπέρυθρον· τὸ δὲ πρόμηκες μέλαν σπερμάτια μηκωνικὰ ἔχον· ἰσχυρότερον δὲ πολὺ τοῦτο θατέρου· θερμαντικὰ δὲ ἄμφω· δι' ὃ καὶ πρὸς τὸ κώνειον βοηθεῖ ταῦτά τε καὶ ὁ λιβανωτός.

2 Ὁ δὲ Κνίδιος κόκκος στρογγύλον ἐρυθρὸν τῇ χροιᾷ μεῖζον δὲ τοῦ πεπέριος ἰσχυρότερον δὲ πολὺ τῇ θερμότητι, δι' ὃ καὶ ὅταν δίδωσι κατάποτον, διδόασι γὰρ πρὸς κοιλίας λύσιν, ἐν ἄρτῳ ἢ στέατι περιπλάττοντες· κάει γὰρ ἄλλως τὸν φάρυγγα.

Θερμαντικὸν δὲ καὶ ἡ τοῦ πευκεδάνου <ῥίζα,> δι' ὃ καὶ ἄλειμμά τι ποιοῦσιν ἐξ αὐτῆς ἱδρωτικὸν ὥσπερ καὶ ἐξ ἄλλων. δίδοται δὲ ἡ τοῦ πευκε-

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[1] ἀφ' conj. Sch.; ἐφ' U*P; Ald. omits the preposition.
[2] Cited by Athen. 2. 73; *cf.* Diosc. 2. 159.
[3] Plin. 27. 70.

others have opposite virtues, one might raise a question which is perhaps equally perplexing in regard to other matters, to wit, whether those that produce the same effect do so in virtue of some single virtue which is common to them all, or whether the same result may not come about also from[1] different causes.—Let us be content to put the question thus: but now we must proceed to speak of the natural qualities or virtues of any other plants that we can mention.

Of certain plants, not yet mentioned, which possess special properties.

XX. [2] Pepper is a fruit, and there are two kinds: one is round like bitter vetch, having a case and flesh like the berries of bay, and it is reddish: the other is elongated and black and has seeds like those of poppy: and this kind is much stronger than the other. Both however are heating: wherefore these, as well as frankincense, are used as antidotes for poisoning by hemlock.

[3] The 'Cnidian berry' is round, red in colour, larger than that of pepper, and far stronger in its heating power; wherefore, when it is given as a pill[4] (for it is given to open the bowels) they knead it up in a piece of bread or dough: otherwise it burns the throat.

[5] The root[6] of sulphur-wort is also heating, wherefore they make of it an ointment to produce a sweat, as with other things so used. This root[6] is also

[4] *κατάποτον* conj. Sch.; *κατὰ πότον* Ald. *cf.* *καταπότιον* 9. 8. 3.
[5] *cf.* 9. 14. 1; Plin. 25. 117.
[6] *ῥίζα* add. W.

δάνου ῥίζα καὶ πρὸς τοὺς σπλῆνας· τὸ δὲ σπέρμα οὐ χρήσιμον οὐδὲ ὁ ὀπὸς αὐτῆς· γίνεται δὲ ἐν Ἀρκαδίᾳ.

Δαῦκον δὲ περὶ Πατραϊκὴν τῆς Ἀχαΐας διαφέρον, θερμαντικὸν φύσει· ῥίζαν δὲ ἔχει μέλαιναν.

3 Θερμαντικὸν δὲ καὶ δριμὺ καὶ τῆς ἀμπέλου τῆς ἀγρίας ῥίζα· δι' ὃ καὶ εἰς ψίλωθρον χρήσιμον καὶ ἐφηλίδας ἀπάγειν· τῷ δὲ καρπῷ ψιλοῦσι τὰ δέρματα. τέμνεται δὲ πᾶσαν ὥραν ὀπώρας δὲ μάλιστα.

Δρακοντίου δὲ ῥίζα βῆχας ἐν μέλιτι διδομένη παύειν χρησίμη. καυλὸν δὲ ἔχει ποικίλον ὀφιώδη· σπέρματι δ' οὐ χρῶνται.

Ἡ δὲ τῆς θαψίας ἐμετική· ἐὰν δέ τις κατάσχῃ, καθαίρει καὶ ἄνω καὶ κάτω· δύναται δὲ καὶ τὰ πελιώματα ἐξαιρεῖν· ὑπώπια δὲ ποιεῖ ἄλλα ἔκλευκα. ὁ δὲ ὀπὸς ἰσχυρότερος αὐτῆς καθαίρει καὶ ἄνω καὶ κάτω· σπέρματι δ' οὐ χρῶνται· γίνεται δὲ καὶ ἄλλοθι μὲν ἀτὰρ καὶ ἐν τῇ Ἀττικῇ· καὶ τὰ βοσκήματα ταύτης οὐχ ἅπτεται τὰ ἐγχώρια, τὰ δὲ ξενικὰ βόσκεται καὶ διαρροίᾳ διαφθείρεται.

4 Τὸ δὲ πολυπόδιον μετὰ τὰ ὕδατα ἀναβλαστεῖ σπέρμα δὲ οὐ φύει.

Τὸ δὲ τῆς ἐβένου ξύλον κατὰ μὲν τὴν πρόσοψιν ὅμοιον πύξῳ φλοϊσθὲν δὲ μέλαν γίνεται· χρήσιμον δὲ πρὸς ὀφθαλμίας ἀκόνῃ τριβόμενον.

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[1] *cf.* 9. 15. 5. [2] *cf.* 9. 15. 8. n.
[3] *cf.* 9. 14. 1; Diosc. 4. 181–183; Plin. 23. 19 and 21.
[4] *cf.* 7. 12. 2; Diosc. 2. 167. *cf.* Plin. 24. 89.
[5] Diosc. 4. 153; Plin. 13. 125 and 126.

given for the spleen: but neither its seed nor its juice is of use: it grows in Arcadia.[1]

[2] *Daukon* of excellent quality grows in the district of Patrai in Achaia, and is heating by nature: it has a black root.

[3] The root of the 'wild vine' (bryony) is also heating and pungent: wherefore it is useful as a depilatory and to remove freckles: and the fruit is used for smoothing hides. It is cut at any season, but especially in autumn.

[4] The root of edderwort given in milk is useful for stopping a cough. It has a variegated snake-like stem: the seed is not used.

[5] The root of *thapsia* has emetic properties: and, if one retains it, it purges both upwards and downwards. It is also able to remove bruises: and it restores other contusions to a pale colour.[6] Its juice is stronger and purges both upwards and downwards: the seed is not used. It grows especially in Attica, but also in other places: the cattle of the country do not touch it, but imported cattle feed on it and perish of diarrhoea.[7]

[8] Polypody springs up[9] after rain, and produces no seed.

[10] The wood of ebony is in appearance like box, but when barked it becomes black: it is useful against ophthalmia, and is rubbed on a whetstone for that use.

[6] *ὑπώπια . . . ἕκλευκα*: text perhaps defective.

[7] *διαρροίᾳ* conj. Sch.; *διάρροια ἡ* UM: *διάρροια αὐτοῖς γίνεται ἡ* Ald.G.

[8] *cf.* 9. 13. 6; *C.P.* 2. 17. 4. The account of the virtues of this plant is evidently missing.

[9] *ἀναβλαστεῖ* conj. W.; *αἰεὶ βάλλει* Ald.

[10] Diosc. 1. 98; Plin. 24. 89.

Ἡ δὲ ἀριστολοχία παχεῖα καὶ ἐσθιομένη πικρὰ τῷ χρώματι μέλαινα καὶ εὔοσμος, τὸ δὲ φύλλον στρογγύλον, οὐ πολὺ δὲ τὸ ὑπὲρ τῆς γῆς. φύεται δὲ καὶ μάλιστα ἐν τοῖς ὄρεσι· καὶ αὕτη βελτίστη. τὴν δὲ χρείαν αὐτῆς εἰς πολλὰ καταριθμοῦσιν· ἀρίστη μὲν πρὸς τὰ κεφαλόθλαστα, ἀγαθὴ δὲ καὶ πρὸς τὰ ἄλλα ἕλκη καὶ πρὸς τὰ ἑρπετὰ καὶ πρὸς ὕπνον καὶ πρὸς ὕστεραν ὡς πεσσός, τὰ μὲν σὺν ὕδατι ἀναδευομένη καὶ καταπλαττομένη, τὰ δ' ἄλλα εἰς μέλι ξυομένη καὶ ἔλαιον· τῶν δὲ ἑρπετῶν ἐν οἴνῳ ὀξίνῃ πινομένη καὶ ἐπὶ τὸ δῆγμα ἐπιπαττομένη· εἰς ὕπνον δὲ ἐν οἴνῳ μέλανι αὐστηρῷ κνισθεῖσα· ἐὰν δὲ αἱ μῆτραι προπέσωσι, τῷ ὕδατι ἀποκλύζειν. αὕτη μὲν οὖν ἔοικε διαφέρειν τῇ πολυχρηστίᾳ.

Τῆς δὲ σκαμμωνίας ὥσπερ ἐξ ἐναντίας ὁ ὀπὸς μόνον χρήσιμος ἄλλο δ' οὐδέν.

Ἡ δὲ τῆς πτερίδος ῥίζα μόνον τῷ χυλῷ γλυκύστρυφνος· ἕλμινθα δὲ πλατεῖαν ἐκβάλλει· σπέρμα δὲ οὐκ ἔχει οὐδὲ ὀπόν· τέμνεσθαι δὲ ὡραίαν μετοπώρου φασίν.

Ἡ δ' ἔλμις σύμφυτον ἐνίοις ἔθνεσιν· ἔχουσι γὰρ ὡς ἐπὶ πᾶν Αἰγύπτιοι Ἄραβες Ἀρμένιοι Ματαδίδες Σύροι Κίλικες· Θρᾷκες δ' οὐκ ἔχουσιν οὐδὲ Φρύγες· τῶν δὲ Ἑλλήνων Θηβαῖοί τε οἱ περὶ τὰ γυμνάσια καὶ ὅλως Βοιωτοί· Ἀθηναῖοι δ' οὔ.

Πάντων δὲ τῶν φαρμάκων ὡς ἁπλῶς εἰπεῖν βελτίω τὰ ἐκ τῶν χειμερινῶν καὶ προσβόρρων

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[1] *cf.* 9. 13. 3. [2] καὶ μάλιστα conj. W.; μάλιστα καὶ Ald.
[3] αὕτη conj. Scal.; αὐτὴ Ald.

[1] Birthwort is a stout plant and is bitter to the taste : it is black in colour and fragrant ; the leaf is round. However there is not much of the plant above ground. It grows especially [2] on mountains, and then [3] it is best. Many uses of it for various purposes are enumerated ; it is best for bruises on the head, good also for other wounds, against snake-bites, to produce sleep, for the womb as a pessary : for some purposes it is soaked with water and applied as a plaster, for others it is scraped into honey and olive-oil : against snake-bites it is drunk in sour wine and also sprinkled over the bite ; to induce sleep it is given pounded up in black dry wine : [4] in cases of *prolapsus uteri* it is used in water as a lotion. This plant then seems to have a surpassing variety of usefulness.

[5] Of scammony, as though by contrast, only the juice is useful and no other part.

Of male-fern no part but the root is useful and it has a sweet astringent taste. It expels the flat worm. It has no seed nor juice : and they say it is ripe for cutting in autumn.

[6] (This worm naturally infests certain races : speaking generally the following are liable to it—the Egyptians, the Arabians, the Armenians, the Matadides, the Syrians, the Cilicians : the Thracians have it not, nor the Phrygians. Among the Hellenes those Thebans who frequent wrestling-schools and the Boeotians generally are liable to it : but not the Athenians.)

Of all drugs, to speak generally, those are better which come from places that are wintry, face the

[4] Cited by Apollon. *Hist. Mirab.* 29.
[5] Diosc. 4. 170 ; Plin. 27. 78–80. [6] Plin. 27. 145.

καὶ ξηρῶν· δι' ὃ καὶ τῶν ἐν Εὐβοίᾳ τὰ ἐν ταῖς Αἰγαῖς ἢ τὰ ἐν τῷ Τελεθρίῳ φασί· ξηρότερα γάρ· τὸ δὲ Τελέθριον σύσκιον.

6 Περὶ μὲν οὖν τῶν ῥιζῶν ὅσαι φαρμακώδεις καὶ ὁποιασοῦν ἔχουσι δυνάμεις εἴτε ἐν αὐταῖς εἴτε ἐν τοῖς ὀποῖς ἢ καὶ ἄλλῳ τινὶ τῶν μορίων, καὶ τὸ ὅλον εἴ τι φρυγανικὸν ἢ ποώδες ἔχει τοιαύτας δυνάμεις, καὶ περὶ τῶν χυλῶν τῶν τε εὐόσμων καὶ τῶν ἀόσμων καὶ ὅσας ἔχουσι διαφοράς, αἵπερ οὐθὲν ἧττον φυσικαί εἰσιν, εἴρηται.

north and are dry: wherefore of those which grow in Euboea best, they say, are the drugs of Aigai or Telethrion, these places being dry, while Telethrion is also shady.

[1] Thus we have spoken of drugs, those that are medicinal and those that have virtues of whatsoever kind, whether in the root itself, or in the juice, or in any other of their parts, and in general of all the shrubby or herbaceous plants which have such virtues, as well as their tastes, whether they be fragrant or without fragrance, with the differences between them, which are equally part of their essential character.

[1] This section begins a tenth book in UMAld.H.G; *cf.* 9. 8. 1 n. The concluding words can hardly represent the original text.

CONCERNING ODOURS

Introductory: Of odours in general and the classification of them.

I. Odours in general, like tastes, are due to mixture: for anything which is uncompounded has no smell, just as it has no taste: wherefore simple substances have no smell, such as water air and fire: on the other hand earth is the only elementary substance which has a smell, or at least it has one to a greater extent than the others, because it is of a more composite character than they.

Of odours some are, as it were, indistinct and insipid, as is the case with tastes, while some have a distinct character. And these characters appear to correspond to those of tastes, yet they have not in all cases the same names, as we said in a former treatise; nor in general are they marked off from one another by such specific differences as are tastes: rather the differences are, one may say, in generic character, some things having a good, some an evil odour.[1] But the various kinds of good or evil odour, although they exhibit considerable differences, have not received further distinguishing names, marking off one particular kind of sweetness or of bitterness from another: we speak of an odour as pungent, powerful, faint, sweet, or heavy, though some of these descriptions apply to evil-smelling things as well as to those which have a good odour.

Ἡ δὲ καθόλου καὶ ὥσπερ ἐπὶ πᾶσι τοῖς διαφθειρομένοις σαπρότης. ἅπαν γὰρ τὸ σηπόμενον κακῶδες, εἰ μή τις τὴν ὀξύτητα λέγει τοῦ οἴνου
3 σαπρότητα τῇ ὁμοιότητι τῆς φθορᾶς. ἐν ἅπασι δ' ἐστὶν ἡ τοῦ σαπροῦ κακωδία καὶ ἐν φυτοῖς καὶ ἐν ζώοις καὶ ἐν τοῖς ἀψύχοις· ἐν ἅπασι δὲ διαφθειρομένοις ὧν μὴ ἡ σύστασις εὐθὺς ἐκ τοιαύτης ὕλης· ἔχει γὰρ ἔνια καὶ τὴν τῆς ὕλης ὀσμήν, οὐ μὴν ἐπὶ πάντων γε τοῦτ' ἀκολουθεῖ. πολλὰ γὰρ οὐ κακώδη τὰ ἐκ τῶν σαπρῶν, ὡς οὐδ' οἱ μύκητες οἱ ἐκ τῆς κόπρου φυόμενοι· τὰ δ' ἐκ σήψεως φυόμενα καὶ συνιστάμενα κακώδη. εὔοσμα μὲν οὖν ὡς ἁπλῶς εἰπεῖν τὰ πεπεμμένα καὶ λεπτὰ καὶ ἥκιστα γεώδη· τὸ γὰρ τῆς ὀσμῆς ἐν ἀναπνοῇ· κακώδη δὲ δηλονότι τἀναντία. πολλὰ δὲ ὥσπερ τῶν γλυκέων ἐμφαίνει τινὰ πικρότητα, καὶ τῶν εὐωδῶν βαρύτητα ταῖς ὀσμαῖς.

4 II. Ἔχει δὲ ἕκαστον ὀσμὴν ἰδίαν καὶ ζώων καὶ φυτῶν καὶ τῶν ἀψύχων ὅσα ὀσμώδη· πολλὰ

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[1] And so here we have a term which possibly is applied only to the one class of 'evil' odours.

[2] Which is not an 'evil' odour.

[3] *i.e.* putridity is a quality which things acquire as they decay, and does not necessarily imply that they are themselves formed out of decaying matter. In fact things so produced are not always 'putrid.'

[4] The sense is apparently that 'lighter' (or less solid) things exhale a lighter and pleasanter odour because in their

Putridity however is a general term, applied, one may say, to anything which is subject to decay[1]: for anything which is decomposing has an evil odour,—unless indeed the name putridity be extended to sourness[2] in wine because the change in the wine is analogous to decomposition. The evil odour of putridity is found in all things, alike in plants in animals and in inanimate things: it attends the decay of things which are not formed directly out of a substance which is decaying: for some things have also the odour of that substance, though it is not found in every case.[3] Thus in many instances things which are produced by decaying matter have no evil odour: for instance, mushrooms which grow from dung have none: but things which grow from decay and are actually formed out of it have such an odour. To speak generally then, things that have been cooked, delicate things, and things which are least of an earthy nature have a good odour,[4] (odour being a matter of exhalation), and it is obvious that those of an opposite character have an evil odour. But, even as many things pleasant to the taste present a certain bitterness, so many things that have a good odour have a kind of heavy scent.

Of natural odours; of those of animals and of the effect of odours on animals.

II. Every plant animal or inanimate thing that has an odour has one peculiar to itself: but in many

case exhalation is easier. The sense given to ἀναπνοή requires illustration (the passages cited by LS. are not in point). Sch., construing apparently as W. does, 'since smell depends on breathing' (? inhalation), admits that he does not see the point of this clause.

δ' ἡμῖν οὐ φαίνεται διὰ τὸ χειρίστην ἔχειν τὴν αἴσθησιν ταύτην ὡς εἰπεῖν. ἐπεὶ τοῖς γε ἄλλοις καὶ τὰ παντελῶς ἄοδμα φαινόμενα δίδωσί τινα ὀσμήν, ὥσπερ αἱ κριθαὶ τοῖς ὑποζυγίοις αἱ ἐκ τῆς Κεδροπόλιος, ἃς οὐκ ἐσθίουσιν διὰ τὴν κακωδίαν. ἡμᾶς δὲ καὶ αἱ τῶν ζώων λανθάνουσιν τῶν ὀσμωδῶν δοκούντων. εὐωδίᾳ μὲν οὖν οὐθὲν φαίνεται καθ' αὑτὸ χαίρειν ὡς εἰπεῖν, ἀλλ' ὅσα πρὸς τὴν τροφὴν καὶ τὴν ἀπόλαυσιν. πονεῖν δ' ἔνια φαίνεται ταῖς ὀσμαῖς καὶ ταῖς εὐωδίαις, εἴπερ ἀληθὲς τὸ ἐπὶ τῶν γυπῶν καὶ τῶν κανθάρων. τοῦτο δὲ δῆλον ὡς δι' ἐναντίωσιν τῆς ἐν αὐτοῖς φύσεως. ὡς δὲ καθ' ἕκαστον ἅμα δεῖ τὴν γε κρᾶσιν τὴν ἑκάστου καὶ τὴν τῆς ὀσμῆς λαμβάνειν δύναμιν.

5 Εἰσὶ μὲν οὖν ἔνιαι τῶν εὐόσμων καὶ ἐν ταῖς τροφαῖς, οἷον αἱ τῶν ἀκροδρύων καὶ ἀπίων καὶ μήλων· αὗται γὰρ ἄνευ τῆς προσφορᾶς ἡδεῖαι, καὶ μᾶλλον ὡς εἰπεῖν. οὐ μὴν ἀλλ' ὥς γ' ἁπλῶς διελεῖν αἱ μέν εἰσι καθ' αὑτὰς αἱ δὲ κατὰ συμβεβηκός· αἱ μὲν τῶν χυλῶν καὶ τῆς τροφῆς κατὰ συμβεβηκός, αἱ δ' ὥσπερ τῶν ἀνθῶν καθ' αὑτάς. ὡς δ' ἐπίπαν τὰ εὔοσμα, καθάπερ καὶ πρότερον ἐλέχθη, δύσχυμα καὶ στρυφνὰ καὶ ὑπόπικρα.

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[1] In Thrace. *cf.* Arist. *H.A.* 9. 36. Turn. quotes an illustration from Scriptor θαυμασίων ἀκουσμάτων 126.

[2] εὐωδίαις. ? εὐώδεσι.

cases it is not obvious to us because, one might almost say, our sense of smell is inferior to that of all other animals. Thus things which appear to us to have no odour give forth an odour of which other animals are conscious: for instance beasts of burden can smell the barley of Kedropolis,[1] and refuse to eat it because of its evil odour. Also we are unaware of the odour of animals which appear to possess one. Now no animal appears to take pleasure in a good odour for its own sake, so to speak, but only in the odour of things which conduce to its nurture and enjoyment. Indeed some animals seem to be annoyed by odours, even good[2] ones, if what is said of vultures and beetles be true; the explanation is that their natural character is antipathetic to odours. To appreciate this in particular cases one should take into consideration the temperament of the animal in question and also its power of smell.

Of smell and taste.

Now the odour of some things which have a good odour resides in things which are used for food, for instance that of stone-fruits[3] pears and apples, the smell of which is sweet even if one does not eat them; indeed it may be said to be sweeter in that case. However, to make a general distinction, some odours exist independently, while others are incidental;[4] those of juices and things used for food are incidental, those of flowers exist independently. And, as was said above,[5] things which have a good odour are generally of unpleasant, astringent or

[3] *ἀκροδρύων* here apparently plums, peaches, etc.

[4] *i.e.* the smell is a kind of 'accident,' or by-product of the taste. [5] 1. 3.

ἔνια δὲ τῶν εὐχύμων καὶ κακώδη, καθάπερ καὶ τὸ Αἰγύπτιον καλούμενον σῦκον, γλυκὺ ὄν, καὶ εἰ μὴ πανταχοῦ ἀλλ' ἐνιαχοῦ. καὶ ἡ ἄρκευθος ἐμφαίνει τινὰ τῇ μασήσει κακωδίαν γλυκεῖα οὖσα· τὸ δ' οὖρον ποιεῖ εὐῶδες.

6 Ἐπεὶ δὲ τῶν ὀσμῶν αἱ μὲν ἐν φυτοῖς καὶ τοῖς τούτων μορίοις, οἷον κλωσὶ φύλλοις φλοιοῖς καρποῖς δακρύοις, αἱ δὲ ὥσπερ διείλομεν ἐν ζώοις [καὶ φυτοῖς] καὶ τοῖς ἀψύχοις, αὗται μὲν φανερὸν ὅτι πέψιν ἔκασται λαμβάνουσιν ἐν τοῖς οἰκείοις [αἷς]· καὶ τὸ εὐῶδες καὶ κακῶδες ἀκολουθεῖ κατὰ τὰς οἰκείας φύσεις, ἡ δὲ πέψις τῷ οἰκείῳ θερμῷ. ἐν δὲ τοῖς ἀψύχοις ταῖς τῶν ἁπλῶν δυνάμεσι καὶ γίνονται καὶ μεθίστανται καθάπερ οἱ χυμοί.

7 III. Ὅσαι δὲ δὴ κατὰ τέχνην καὶ ἐπίνοιαν γίνονται περὶ τούτων πειρατέον εἰπεῖν ὥσπερ καὶ περὶ τῶν χυλῶν. ἐν ἀμφοῖν δὲ δῆλον ὡς ἀεὶ πρὸς τὸ βέλτιον [ἦν] ἡμῖν ἡ ἀναφορά· πᾶσα γὰρ τέχνη στοχάζεται τούτου. εἰσὶ μὲν οὖν καὶ τοῖς ἀμίκτοις ὀσμαί τινες πρὸς ἃς συνεργεῖν πειρῶνται καὶ ταῖς παρα<σκευαῖς, ὡς καὶ> πρὸς τὰς τῶν χυμῶν εὐστομίας. οὐ μὴν ἀλλ' ὥς γ' ἁπλῶς

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[1] *cf. H.P.* 1. 11. 2.

[2] *i.e.* the berry: Sch. would read ἀρκευθίς. *cf. H.P.* 3. 12. 4, with which this statement is inconsistent. Sch. suggests punctuating—γλυκὺ ὄν. καὶ εἰ μὴ πανταχοῦ ἀλλ' ἐνιαχοῦ καὶ ἡ ἄρκευθος κ.τ.λ.

[3] καὶ φυτοῖς om. Turn.

[4] αἷς I omit; ᾗ καὶ τὸ εὖ. conj. Turn.

somewhat bitter taste. Again some things which have a good taste have also an evil odour, such as the carob,[1] which is sweet (this is true of some regions, if not of all). Again the Phoenician cedar,[2] though it is sweet to the taste, when chewed produces a sort of evil odour, though it makes the water fragrant.

Of odours in plants.

. Some odours being found in plants or in their parts—as twig, leaf, bark, fruit, gum—and others, as we distinguished, in animals[3] and in inanimate things, it is plain that the former are matured each of them in the part to which it belongs; and[4] a good or evil odour follows according to the natural character of that part, the maturing being due to the warmth which is found in it. On the other hand in inanimate things the odour, like the taste, is formed and modified by the properties of the simple substances of which the thing is made.

Of artificial odours in general and their manufacture: especially of the use of perfumes in wine.

III. Next we must endeavour to speak of those odours, and also those tastes, which are artificially[5] and deliberately produced. In either case it is clear that improvement is always what we have in view; for that is the aim of every artificial process. Now even uncompounded substances have certain odours, which men endeavour to assist by artificial means,[6] even as they try to assist nature in producing palatable tastes. However, to speak generally, the

[5] The same phrase occurs in similar connexion *C. P.* 6. 11. 2.

[6] Text defective. Ald Bas. Vo. have marks of omission. W. after Turn. gives καὶ ταῖς παρα<σκευαῖς, ὡς καὶ> ταῖς τῶν χυμῶν εὐστο<μίαις>, which I have slightly altered.

εἰπεῖν ἐν μίξει τὸ πλέον, καὶ οὕτως αἱ <μίξεις> δυοῖν μὲν ὡς τῷ γένει λαβεῖν, ὑγροῦ καὶ ξηροῦ· τριχῶς δὲ γί<νονται>, ὅταν ἢ ὁμογενὲς ὁμογενεῖ, ἢ παράλλαττον τῷ παραλλάττοντι, ἢ ὑγρῷ ὑγρὸν ἢ ξηρῷ ξηρόν, <ἢ ὑγρῷ ξηρόν>.

8 Ἐκ δυοῖν γὰρ τούτων καὶ ἡ τῶν χυλῶν καὶ τῶν ὀσμῶν γένεσις· ὡς μὲν οἱ τὰ ἀρώματα καὶ τὰ διαπάσματα συντιθέντες ξηροῖς πρὸς ξηρά· ὡς δ' οἱ τὰ μύρα κεραννύντες ἢ τῷ οἴνῳ ἐπιχέοντες ὑγροῖς πρὸς ὑγρά. τὸ δὲ τρίτον, ὃ καὶ πλεῖστόν ἐστιν, ὡς οἱ μυρεψοὶ ξηροῖς πρὸς ὑγρά· παντὸς γὰρ μύρου καὶ χρίσματος ἡ σύνθεσις αὕτη. δεῖ δ' εἰδέναι ποῖαι ποίοις εὔμικτοι καὶ ποῖαι ποίοις συνεργοῦσιν εἰς τὸ ποιεῖν μίαν ὥσπερ ἐπὶ τῶν χυμῶν. καὶ γὰρ ἐκεῖ ταὐτὸ τοῦτο ζητοῦσιν οἱ μιγνύντες καὶ οἷον ἀρτύοντες. ταῦτα μὲν οὖν ἐν οἷς καὶ δι' ὧν αἱ τέχναι ποιοῦνται τὰ τέλη.

9 Μίγνυνται δὲ τὰ μὲν αὐτῆς τῆς ὀσμῆς ἕνεκα καὶ πρὸς ταύτην τὴν αἴσθησιν, τὰ δ' ὥσπερ ἡδύνειν βουλόμενα τὴν γεῦσιν, οἷον ὡς οἱ τὰ μύρα τοῖς οἴνοις ἐπιχέοντες ἢ τὰ ἀρώματα ἐμβάλλοντες.

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[1] I have supplied *μίξεις* to fill the lacuna marked by W. after *οὕτως αἱ*: the text to the end of the section is defective, but a makeshift restoration and rendering seem possible: the sense of *οὕτως* is obscure.

result is usually obtained by a mixture, and accordingly [1] such mixtures are of two things (or classes of things), a liquid and a solid: but there are three ways in which the result may be reached (the combination [2] being one either of like with like, or of unlike substances), according as a liquid is compounded with another liquid, a solid with another solid, or a solid with a liquid.

For tastes and odours alike are derived from these two things: the method of the makers of spices and perfume-powders [3] is to mix solid with solid, that of those who compound unguents or flavour wines is to mix liquid with liquid: but the third method, which is the commonest, is that of the perfumer, who mixes solid with liquid, that being the way in which all perfumes [4] and ointments are compounded. Further one must know which odours will combine well with which, and what combination makes a good blend, just as in the case of tastes: for there too those who make combinations and, as it were, season their dishes, are aiming at this same object. So much for the ingredients and the methods whereby these arts attain their ends.

The object of the mixture is in the one case simply the production of a particular odour and the gratification of the corresponding sense, in the other there is a desire to produce, as it were, a pleasanter taste: this for instance is the object of flavouring wine with perfumes or of putting spices into it.

[2] *i.e.* given two components we have three possible combinations, *A* with *A*, *B* with *B*, or *A* with *B*.

[3] διαπάσματα. *cf.* Plin. 13. 19; 21. 125.

[4] The difference between μύρου and χρίσματος does not appear; μύρον seems to be loosely used, as just above it was used of an entirely liquid mixture.

αἱ γὰρ αἰσθήσεις σύνεγγυς οὖσαι ποιοῦσί τινα ἀπόλαυσιν ἀλλήλων, ὅθεν καὶ αὐτοῖς τοῖς γευστοῖς ζητοῦσι τὰς εὐοσμίας.

10 Ἀπορήσειε δ' ἄν τις ἴσως διὰ τί ποτε μύρον καὶ τἆλλα εὔοσμα τοὺς μὲν οἴνους ἡδύνει τῶν δὲ βρωμάτων οὐδέν, ἀλλὰ πάντα λυμαίνεται καὶ ἀπύρωτα καὶ πεπυρωμένα. τὸ δ' αἴτιον ὑπολη-πτέον ὅτι συμβαίνει τῶν μὲν ξηρῶν[3] ἀφαιρεῖσθαί τε τὸν οἰκεῖον χυλὸν διὰ τὴν ἰσχὺν καὶ ἅμα συνεπιφαίνειν τὸν αὐτοῦ ὄντα στρυφνὸν καὶ ὑπόπικρον· ἅπαν γὰρ τὸ εὔοσμον τοιοῦτον, διαμασωμένοις δὲ καὶ μᾶλλον ἐμφανὲς διά τε τὴν
11 θλῖψιν καὶ τομὴν καὶ ἔτι τῷ χρονίζεσθαι. τὸν δ' οἶνον οὐδέτερον ποιεῖ· καὶ γὰρ ὁ χυλὸς ἰσχυρότατος καὶ πλείων εἰς τὸ μὴ κρατεῖσθαι καὶ οὐδένα τῇ γεύσει χρόνον ἐπιδιατρίβων ἀλλ' ὅσον ἐπιθιγγάνων, ὥστε τὸ μὲν ἡδὺ ἐνδιδόναι τῇ αἰσθήσει τὸ δὲ πικρὸν καὶ δύσχυμον τῇ γεύσει μὴ ἐμφαινειν, ἀλλὰ συμβαίνειν τῷ ὄντι καθάπερ ἥδυσμα γίνεσθαι τῷ πόματι τὴν ὀσμήν· τῷ μὲν γὰρ γλυκεῖ καὶ μάλιστα δεομένῳ διὰ τὸ μηδὲν ἔχειν, τοῖς δ' ἄλλοις ὥσπερ μιᾶς ἐξ ἀμφοῖν γενομένης

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[1] *cf.* 67; Arist. *de Sens.* 5. [2] *cf.* Arist. *l.c.*

[3] As opposed to wine. Sch., misunderstanding this, thinks ξηρῶν corrupt.

[4] I have restored καί, which Sch. and W. omit, missing the point of the antithesis μέν . . . δέ.

[1] For the two senses of taste and smell being akin to one another, each provides in a way for the enjoyment of the other: wherefore it is through things which appeal to the taste, as well as those which appeal to the sense of smell, that men try to discover fragrant odours.

The question may perhaps be raised why perfume and other fragrant things, while they give a pleasant taste to wine,[2] yet have not this effect on any other article of food, but in all cases spoil food, whether it be cooked or not. The explanation we must take to be that this is what happens—the perfume if mixed with solid [3] things is in any case powerful enough to deprive them of their proper taste, and at the same time it makes obtrusive its own taste, which is astringent and somewhat bitter,—all perfumeries having that character,—while, if one bites up the food, this effect is even [4] more apparent because the food is crushed and broken up, and also because it remains longer in the mouth. But on wine neither effect is produced, since in this the taste is very strong and too generally diffused to be overpowered: also wine does not linger on the palate for any length of time, but merely touches it, so that, while it makes one conscious of its own pleasant taste, it does not make the palate feel the bitter unpalatable taste of the perfume: in fact the odour of this acts as a sort of relish [5] to the draught. This effect indeed [6] it has on wine which is sweet and specially needs the addition of perfume, because it has no 'relish' of its own; while with other wines the reason is that, as the effect of the mixture, the

[5] Sc. 'bouquet.'

[6] I have restored γάρ, omitted by Sch. and W.

διὰ τὴν μῖξιν. ὁ γὰρ οἶνος, ὥσπερ καὶ πρότερον ἐλέχθη, δεινὸς δέξασθαι τὰς ὀσμάς.

12 Ἔχει δ' ἀπόρησιν καὶ τόδε, διὰ τί τὰ μὲν ἄνθη καὶ τὰ στεφανώματα ἀσθενέστερα ὄντα ταῖς ὀσμαῖς καὶ πόρρωθεν ὄζει, ἡ δ' ἶρις καὶ τὸ νάρδον καὶ τἆλλα τὰ εὔοσμα τῶν ξηρῶν ἰσχυρότερα ἐγγύθεν· καὶ ἔνιά γε προσενεγκαμένοις, ἔνια δὲ καὶ τρίψεως προσδεῖται καὶ διαιρέσεως, τὰ δὲ καὶ πυρώσεως, ὥσπερ ἡ σμύρνα καὶ ὁ λιβανωτὸς

13 καὶ πᾶν τὸ θυμιατόν. αἴτιον δ' ὅτι τῶν μὲν ἀνθῶν ἐπιπολῆς τὸ ποιοῦν τὴν ὀσμὴν ἅτε μανῶν ὄντων καὶ οὐκ ἐχόντων βάθος, τῶν δὲ ῥιζῶν καὶ πάντων τῶν στερεῶν ἐν βάθει, τὰ δ' ἔξωθεν ἀπεξηραμμένα καὶ πεπυκνωμένα· διὸ καὶ ἀφιᾶσι πόρρω τὰς ἀποπνοίας, τὰ δ' οἷον ἀνοίξεως δέονται τῶν πόρων, ὅθεν διαιρούμενα καὶ κοπτόμενα πάντ' εὐωδέστερα, τὰ δ' ἄνθη κακωδέστερα τριβόμενα· τὰ μὲν γὰρ ἐκφαίνει τὸ οἰκεῖον τὰ δὲ προσλαμβάνει τὸ ἀλλότριον. ὁ δὲ λιβανωτὸς καὶ ἡ σμύρνα πυκνοτέραν ἔτι τὴν φύσιν ἔχοντα προσδέονται πυρώσεως μαλακῆς, ἢ κατὰ μικρὸν ἐκθερμαίνουσα ποιήσει τὴν ἀναθυμίασιν. ἐὰν γὰρ κόπτῃ τις ἢ τρίβῃ ταῦτα, προσοίσονται μὲν

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[1] *i.e.* of the unadulterated wine and of the perfume.

[2] *C.P.* 6. 19. 2. Sch.'s reasons for bracketing this sentence seem inadequate.

[3] *i.e.* fragrant leaves, etc. *cf. H.P.* 1. 12. 4.

[4] Made from the rhizomes : *cf. H.P.* 1. 7. 2, and Index.

two [1] odours combine, as it were, to form one. Wine indeed, as was said before,[2] has a special property of assimilating odours.

Another question also suggests itself,—why it is that, while the smell of flowers and other [3] things used for garlands, though it is not so strong, can be perceived even at a great distance, the iris-perfume,[4] spikenard and other fragrant solids smell stronger at a short distance: and of some of these the smell is only perceived when they are eaten, while some need even to be bruised and broken up, and others to be subjected to fire, as myrrh frankincense and anything that is burnt as incense. The explanation is that, whereas in flowers that which causes the smell is on the surface, seeing that the texture of flowers is open and they are not substantial, in all such solid substances as roots the power of producing smell is diffused through a substantial mass, while the exterior parts are dried up and of close texture: and this is why flowers emit the scent which exhales from them to a long distance, while things like roots need an opening of their passages. Hence, when these are broken up or bruised, they are in all cases more fragrant, while, [5] if flowers are crushed, they have a comparatively evil smell: for under such treatment roots give forth the property which belongs to them, but flowers acquire a property which is not their own. Again frankincense and myrrh, since they are by nature of even closer texture than roots, need a gentle application of fire, which, by gradually warming them, will cause the scent to be exhaled. For, if these substances are bruised or crushed, they will indeed present an odour, but it will not be so

[5] *cf.* Arist. *Probl.* 12. 9; 13. 3 and 11.

ὀσμὴν οὐχ ὁμοίως δὲ ἡδεῖαν οὐδ' εὐταμίευτον. τούτων μὲν οὖν τοιαῦταί τινες αἱ αἰτίαι.

14 IV. Τῶν δὲ μύρων ἡ σύνθεσις καὶ ἡ κατασκευὴ τὸ ὅλον οἷον εἰς θησαυρισμόν ἐστι τῶν ὀσμῶν· διόπερ εἰς τοὔλαιον τίθενται· τοῦτο γὰρ χρονιώτατον καὶ ἅμα πρὸς τὴν χρείαν μάλισθ' ἁρμόττον. ἐπεὶ φύσει ἥκιστα δεκτικὸν ὀσμῆς διὰ τὴν πυκνότητα καὶ τὸ λίπος, αὐτῶν δὲ τούτων τὸ λιπαρώτατον, οἷον τὸ ἀμυγδάλινον· τὸ δὲ σησάμινον καὶ τὸ ἐκ τῶν ἐλαιῶν μάλιστα.

15 Χρῶνται δὲ μάλιστα τῷ ἐκ τῆς βαλάνου τῆς Αἰγυπτίας καὶ Συρίας, ἥκιστα γὰρ λιπαρόν· ἐπεὶ καὶ τῷ ἐκ τῶν ἐλαιῶν μάλιστα χρῶνται τῷ ὠμοτριβεῖ τῆς φαυλίας· δοκεῖ γὰρ ἀλιπέστατον ἔχειν καὶ λεπτότατον· καὶ τούτῳ νέῳ καὶ μὴ παλαιῷ· τὸ γὰρ ὑπὲρ ἐνιαυτὸν ἀχρεῖον παχύτερον καὶ λιπαρώτερον γενόμενον. ἔλαιον μὲν οὖν τὸ τοιοῦτον οἰκειότατον, ἀλιπέστατον γάρ. φασὶ δέ τινες καὶ <ἐν> τῷ χρίσματι τὸ ἐκ τῶν πικρῶν ἀμυγδάλων· πολλὰ δὲ γίνεται περὶ Κιλι-

16 κίαν καὶ ποιοῦσιν ἐξ αὐτῶν χρίσμα. φασὶ δὲ καὶ εἰς τὰ σπουδαῖα τῶν μύρων ἁρμόττειν, ὥσπερ καὶ τὸ ἐκ τῆς βαλάνου καὶ αὐτό· ποιεῖ δὲ <τὰ> κελύφη αὐτῶν εὔοσμον εἰς τὸ ἔλαιον ἐμβαλλό-

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[1] This passage was misunderstood by Plin. 13. 19. The sense seems to be that the viscous character of oil, though preservative of perfume, is not easily receptive of it.

[2] *cf. H.P.* 4. 2. 1; 4. 2. 6. *βάλανος, balanites aegyptiaca.* See Index.

sweet nor so lasting as when they have been subjected to fire. Such are the explanations of these difficulties.

Of the oils used as the vehicle of perfumes.

IV. Now the composition and preparation of perfumes aim entirely, one may say, at making the odours last. That is why men make oil the vehicle of them, since it keeps a very long time and also is most convenient for use. [1] By nature indeed oil is not at all well suited to take in an odour, because of its close and greasy character: and of particular oils this is specially true of the most viscous, such as almond-oil, while sesame-oil and olive-oil are the least receptive of all.

The oil most used is that derived from the Egyptian [2] or Syrian *balanos*, since this is the least viscous; the olive-oil which is most used is that which is pressed from 'coarse olives' [3] in the raw state, since this is thought to be the least greasy and the least coarse: this is used while it is new, not when it is old, for that which is kept above a year is useless, having become thick and viscous. This then is the kind of olive-oil which is most suitable, since it is the least greasy. Some say that for unguent the oil derived from bitter almonds is best: these are abundant in Cilicia, where an unguent is made from them. It is said that this is suitable for choice perfumes, like the oil of the Egyptian *balanos*: this is suitable in itself,[4] however the shells of the fruit are thrown into the oil to give it a good odour: indeed they are also thrown into

[3] *cf. H.P.* 2. 2. 12; *C.P.* 6. 8. 3 and 5.
[4] αὐτὸ conj. Sch.; τοῦτο Vulg.W.

μενα· ἐπεὶ καὶ τὸ τῶν πικρῶν. ἤδη δὲ πῶς οὐκ ἐναντίον ἅμα μὲν τὸ ἀοσμότατον ζητεῖν, ὥσπερ καὶ τὸ ὠμοτριβὲς ἐκ τῶν φαυλιῶν, ἅμα δ' ἐν τούτοις ποιεῖν; δριμύτητα γὰρ ἔχει τὸ τῶν ἀμυγδάλων· εἰ μὴ ἄρ' ὅτι τὸ ἔλαιον ἑψόμενον κακῶδες. ταῦτα μὲν οὖν ἐπισκεπτέον.

17 Χρῶνται δὲ πρὸς πάντα τοῖς ἀρώμασι, τοῖς μὲν ἐπιστύφοντες τὸ ἔλαιον τοῖς δὲ καὶ τὴν ὀσμὴν ἐκ τούτων ἐμποιοῦντες. ὑποστύφουσι γὰρ πᾶν εἰς τὸ δέξασθαι μᾶλλον τὴν ὀσμήν, ὥσπερ τὰ ἔρια εἰς τὴν βαφήν. ὑποστύφεται δὲ τοῖς ἀσθενεστέροις τῶν ἀρωμάτων, εἶθ' ὕστερον ἐμβάλλουσιν ἀφ' οὗ ἂν βούλωνται τὴν ὀσμὴν λαβεῖν· ἐπικρατεῖ γὰρ ἀεὶ τὸ ἔσχατον ἐμβαλλόμενον καὶ ἂν ἔλαττον ᾖ· οἷον ἐὰν εἰς κοτύλην σμύρνης ἐμβληθῇ μνᾶ καὶ ὕστερον ἐμβληθῶσι κιναμώμου δραχμαὶ δύο, κρατοῦσιν αἱ τοῦ κιναμώμου δύο δραχμαί.

18 Θαυμάσειε δ' ἄν τις ἴσως τοῦτό τε καὶ διὰ τί ποτε τὰ ἀρώματα προεμβαλλόμενα δεκτικώτερον ποιεῖ τοὔλαιον ὀσμὴν ἔχοντα· δεῖ γὰρ ἀῶδες εἶναι τὸ δεξόμενον, τὸ δὲ κατειλημμένον ὑφ' ἑτέρου οὐκ ἀῶδες, ὥσθ' ἧττον ἐχρῆν εἶναι δεκτικόν. αἴτιον δ' ἀμφοτέρων ἢ πάντων τὸ αὐτό. ξηρὰ γὰρ ὄντα τὸ λίπος ἕλκει πρὸς ἑαυτὰ

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[1] τὸ conj. Sch.; τὰ Vulg. W. Sch. also adds ἀμυγδάλων after πικρῶν.

[2] *i.e.* those derived from the Egyptian *balanos* and bitter almonds.

that[1] which is made from bitter almonds. Once more, is it not inconsistent to seek the vehicle which has the least odour of its own, such as the oil which is pressed raw from 'coarse olives,' and yet at the same time to use the above-mentioned[2] oils as vehicles? (for oil of almonds has a pungent smell). Possibly the explanation is that it is only by being cooked that oil acquires an evil smell.[3] These matters then are subject for enquiry.

They use spices in the making of all perfumes; some to thicken[4] the oil, some in order to impart their odour. For in all cases they thicken the oil to some extent to make it take the odour better, just as they treat wool for dyeing. The less powerful spices are used for the thickening, and then at a later stage they put in the one whose odour they wish to secure. [5] For that which is put in last always dominates, even if it is in small quantity; thus, if a pound of myrrh is put into a half-pint of oil, and at a later stage a third of an ounce of cinnamon is added, this small amount dominates.

At this one may well wonder; and also why it is that the previous addition of spices, which have an odour of their own, renders the oil more receptive: for the vehicle should be scentless, but a substance over which another substance has thus prevailed, cannot be scentless, so that it ought, one would think, to have become *less* receptive. However both facts, or rather all of them, may be accounted for in the same way:—the spices, being solid, attract to

[3] Sc. 'and these oils are used in the raw state' (?). I do not see how Furlanus' explanation, quoted by Sch., is to be found in the text. The following sentence shews that T. does not claim to have settled the question.

[4] *i.e.* to make it less volatile. [5] *cf.* Plin. 13. 19.

καὶ ἀναδέχεται, διὸ καὶ τὴν συνέχειαν ἐξαιρεῖ· μανὸν δὲ γενόμενον [καὶ][1] τοῦ λίπους ἀφαιρεθέντος ἐν ᾧ καὶ ἡ οἰκεία μάλιστα ὀσμή, δεκτικώτερον ἐγένετο τοῦ ἐπιβαλλομένου διὰ τὸ μὴ ἀντιστατεῖν.

19 Ἡ δὲ ἀπὸ τῶν ἀρωμάτων ὀδμὴ καὶ ἀσθενὴς ἅτε εἰς τὸ λιπαρὸν ἀνηλωμένη, καὶ ἔτι κατέχεται τούτῳ διὰ τὸ πληρῶσαι τοὺς πόρους. ὥστε κατὰ λόγον κἂν ἔλαττον ᾖ τὸ ἐπιβαλλόμενον ἐπικρατεῖν τὴν τούτου ὀσμήν· εἰς ἀσθενέστατον γὰρ ἐμπίπτει καὶ δεκτικώτερον. ἀνὰ λόγον δ' ἔχει καὶ ἡ πολυχρονιότης ἡ ἐν ἑκάστῳ καὶ ἡ πρὸς τὴν πύρωσιν εὐσθένεια καὶ τἆλλα τὰ τοιαῦτα. τὸ γὰρ δεκτικώτατον, οἷον τῆς βαλάνου, καὶ χρονιώτατον, καὶ διὰ τὴν αὐτὴν αἰτίαν· μάλιστα γὰρ ὥσπερ ἓν γίνεται καὶ συμφυὲς τὸ μάλιστα δεχόμενον· ἀεὶ γὰρ τὸ τοιοῦτον διαμονώτατον, διὸ καὶ πυρούμενον μάλιστα ἀπαθές.

20 Ὡσαύτως δὲ καὶ τῶν ἄλλων τὸ σησάμινον, τοῦτο γὰρ δεκτικώτατον· τὸ δὲ ἀμυγδάλινον παρακμάζει ταχὺ καὶ ὀλιγοχρονιώτατον διὰ τὴν ἐναντίαν αἰτίαν· τὸ γὰρ ἥκιστα δεξάμενον τάχιστα μεθίησι. τοῦ ῥοδίνου δὲ μάλιστα δεκτικὸν τὸ

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[1] I have bracketed καὶ.

[2–2] This passage is omitted, apparently by accident, in both W.'s texts, though represented in his Latin version. I

themselves the viscid part of the oil, and so it attaches itself to them; thus the density of the oil is destroyed: the oil, thus becoming thinner by the removal[1] of its viscid part which chiefly contains the characteristic odour, becomes more receptive of the spice which is added to it, because it does not now offer resistance.

Again that odour which is due to the spices becomes less powerful as it is spent on the viscid part of the oil, while at the same time it is preserved by this because it has entirely filled up its passages. Wherefore it naturally follows that, even if the added spice is in small quantity, its odour predominates, since it passes into a vehicle which is in itself not at all powerful and which is more receptive than itself. A corresponding account may be given of the keeping quality of the several oils, of their power of resisting fire, and other such qualities. Thus that oil which is most receptive, for instance, that of the Egyptian *balanos*, will also keep longest, and for the same reason; namely that that oil which is most receptive unites, more than others, into one single substance, as it were, with the spices. Such a substance will always last longer than others; which also explains why, if exposed to fire, it is less affected than others.

Of the other oils the same applies to that of sesame, this being specially receptive;[2] but, for the contrary reason, almond-oil soon loses its virtue and keeps for a shorter time than any other, for that oil which has been least receptive parts soonest with the property received. Sesame-oil however receives rose-perfume better than other oils[2] because of its

have printed it from Sch.'s text. The omission is evidently due to the double occurrence of τὸ σήσαμινον.

σησάμινον διὰ τὴν λιπαρότητα· πυρούμενον δὲ ἐξόζει σησάμου καθάπερ ἀναλυόμενον. αἱ μὲν οὖν τῶν ἐλαίων φύσεις καὶ δυνάμεις τοιαῦται.

21 V. Τὰ δ' ἀρώματα πάντα σχεδὸν καὶ εὔοσμα πλὴν τῶν ἀνθῶν ξηρὰ καὶ θερμὰ καὶ στυπτικὰ καὶ δηκτικά. τὰ δὲ καὶ ἔχοντά τινα πικρότητα, καθάπερ καὶ ἐν τοῖς πρότερον εἴπομεν, ὥσπερ ἶρις σμύρνα λιβανωτός, ὡς δ' ἁπλῶς εἰπεῖν καὶ τὰ μύρα. κοινόταται δὲ τῶν δυνάμεων τό τε στυπτικὸν καὶ τὸ θερμαντικόν, ἃ δὴ καὶ ἐργάζονται.

22 Ὑποστύφονται μὲν οὖν πάντα πυρούμενα, τὰς δ' ὀσμὰς τὰς κυρίας ἔνια λαμβάνει ψυχρὰ καὶ ἀπύρωτα. καὶ ἔοικεν ὥσπερ τῶν ἀνθῶν τὰ μὲν ψυχροβαφῆ τὰ δὲ θερμοβαφῆ παραπλησίως ἔχειν καὶ ἐπὶ τῶν ὀσμῶν. πάντων δὲ ἡ ἕψησις εἴς τε τὴν ὑπόστυψιν καὶ τὰς κυρίας ὀσμὰς ἐνιστα-μένων τῶν ἀγγείων ὕδατι γίνεται καὶ οὐκ αὐτῷ τῷ πυρὶ χρωμένων· τοῦτο δέ, ὅτι μαλακὴν εἶναι δεῖ τὴν θερμότητα, καὶ ἀπουσία πολλὴ γένοιτ' ἂν τῇ φλογὶ χρωμένων, καὶ ἔτι καῦσιν ἂν ὄζοι.

23 Ποιεῖ δ' ἐλάττω τὴν ἀπουσίαν ὅσα πυρούμενα λαμβάνει τὰς κυρίας ὀσμὰς μᾶλλον ἢ ὅσα ψυχρὰ διὰ τὸ προφυρᾶσθαι τὰ πυρούμενα, τὰ μὲν οἴνῳ εὐώδει, τὰ δὲ ὕδατι· ἧττον γὰρ ἀναπίνει· τὰ δὲ ψυχρὰ ξηρὰ ὄντα μᾶλλον, καθάπερ ἶρις κοπεῖσα.

viscid quality; and, when subjected to fire, it gives out a smell of sesame, as though it were being disintegrated. Such are the special characters and properties of the various oils.

Of the spices used in making perfumes and their treatment.

V. Almost all spices and sweet scents except flowers are dry hot astringent and mordant. Some also possess a certain bitterness, as we said above, as iris, myrrh, frankincense, and perfumes in general. However the most universal qualities are astringency and the production of heat; they actually produce these effects.

All spices are given their astringent quality by exposure to fire, but some of them assume their special odours even when cold and not exposed to fire; and it also appears that, just as with vegetable dyes some are applied hot and some cold, so is it with odours. But in all cases the cooking, whether to produce the astringent quality or to impart the proper odour, is done in vessels standing in water and not in actual contact with the fire; the reason being that the heating must be gentle, and there would be considerable waste if these were in actual contact with the flames; and further the perfume would smell of burning.

However there is less waste when the perfume obtains its proper odour by exposure to fire than when it does so in a cold state, since those perfumes which are subjected to fire are first steeped either in fragrant wine or in water: for then they absorb [1] less: while those which are treated in a cold state, being dry, absorb [1] more, for instance bruised iris-root. Thus, if

[1] ἀναπίνει. So Sch. explains. *cf.* ἐκπίνωσιν, 24.

λαμβάνοντος γὰρ τοῦ ἀμφορέως ξηρᾶς ἴριδος κεκομμένης μέδιμνον καὶ δύο ἡμίεκτα πολλὴν ποιεῖν φασὶν ἀπουσίαν, ἐὰν δὲ μετρίως φυράσῃ λείπειν ὅσον δύο χόας, τοῖς δὲ πολλοῖς ἔλαττον.

24 Γίνεται δὲ τὸ βέλτιον ἴρινον ἐὰν ᾖ ξηρὰ καὶ ἀπύρωτος ἡ ἶρις· ἀκρατεστέρα γὰρ ἡ δύναμις ἢ ἐὰν φυραθεῖσα καὶ πυρουμένη. συμβαίνει δὲ ὥσπερ καὶ ἐκθλίβεσθαι μᾶλλον ἐκ τῶν προπεφυραμένων διὰ τὸ ἧττον ἀναδέχεσθαι καὶ ἕλκειν εἰς αὑτό· προστύφοντες δὲ οὐ πολὺν χρόνον ἐῶσι τὰ ἀρώματα ἀλλ' ἐξαιροῦσιν, ὅπως μὴ πολὺ ἐκπίνωσιν.

25 Πρὸς ἕκαστον δὲ τῶν μύρων ἐμβάλλουσι τὰ πρόσφορα τῶν ἀρωμάτων, οἷον εἰς μὲν τὴν κύπρον καρδάμωμον ἀσπάλαθον ἀναφυράσαντες τῷ εὐώδει. εἰς δὲ τὸ ῥόδινον σχοῖνον ἀσπάλαθον κάλαμον. ἡ δ' ἀναφύρασις ὁμοίως. καὶ τοῖς ἄλλοις ἀεὶ τὰ ἁρμόττοντα. τῷ ῥοδίνῳ δ' ἐμβάλλονται καὶ ἄλες πολλοὶ καὶ τοῦτ' ἴδιον παρὰ τἆλλα, διὸ καὶ πλείστη ἀπουσία γίνεται· μίγνυται γὰρ εἰς τὸν ἀμφορέα δύο μέδιμνοι.

26 Τῆς δὲ κύπρου ἡ μὲν ἐργασία παραπλησία τῇ

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[1] Dry measure: the equivalents given are, of course, only approximate.

[2] *τὸ βέλτιον ἴρινον* W. after Sch.; *τὸ βέλτιον τὸ ἴρινον* vulg. The article must be omitted in one place or the other.

κύπρος, called from a tree of that name: not mentioned in *H.P.* *cf.* Plin. 12. 119.

[4] *cf.* *H.P.* 9. 7. 2 and 3. [5] *cf.* *H.P.* 9. 7. 3.

into eight and a half gallons of oil we put thirteen gallons[1] of dry and bruised iris-root, they say that much loss is caused, while if one does not steep it too much, only about eleven pints and a half are wasted: and in the case of most perfumes the waste is less.

However the superior[2] iris-perfume is made by using the root dry and not subjecting it to fire: for then its virtue asserts itself more completely than when it is steeped in a liquid or subjected to fire. It also comes to pass that, if the perfumes have been first steeped, their virtues are, as it were, squeezed out of them to a greater extent, because they take in and absorb less: and so, when they are making them astringent, they do not leave the spices in the oil for long, but take them out, so that they should not absorb an excessive amount.

For making each perfume they put in the suitable spices. Thus to make *kypros*[3] they put in cardamom[4] and *aspalathos*,[5] having first steeped them in sweet wine.[6] To make rose-perfume they put in ginger-grass *aspalathos* and sweet-flag: and these are steeped as in the case of *kypros*. So too into each of the others are put the spices which suit them. Into rose-perfume moreover is put a quantity of salt[7]: this treatment is peculiar to that perfume, and involves a great deal of waste, twenty-three gallons[8] of salt being put to eight gallons and a half of the perfume.

The manufacture of *kypros* resembles that of

[6] τῷ εὐώδει here evidently means the same as τῷ γλυκεῖ, 44, where τῷ οἴνῳ τῷ εὐώδει occurs just above: *cf.* μελικράτῳ ἢ γλυκεῖ, *C.P.* 6. 17. 2.

[7] To prevent decay, as Diosc. 2. 53 explains.

[8] Turn. suggests that μέδιμνοι should be μναῖ, the initial M having been misunderstood by a copyist.

τοῦ ῥοδίνου· πλὴν ἀλλ' ἐάν τις μὴ ταχέως ἐξαίρῃ καὶ ἀποθλίβῃ σῆψις ἐγγινομένη φθείρει τὰ μύρα διὰ τὴν δυσωδίαν· ποιεῖ γὰρ σῆψιν ἀνυγραινομένη. παραπλησία δ' ἐργασία καὶ τοῦ μηλίνου· προστυφέντος γὰρ ἐλαίου καὶ τὰ μῆλα ἐμβάλλουσιν εἰς ψυχρόν, εἶτ' ἐξαιροῦσι πάλιν πρὸ τοῦ μελαίνεσθαι κατὰ πάσας τὰς ἐμβολάς· μελαινομένων γὰρ σῆψις διὰ τὸ ἀνυγραίνεσθαι, καθάπερ καὶ ἐπὶ τῆς κύπρου.

27 VI. Ἅπαντα δὲ συντίθενται τὰ μύρα τὰ μὲν ἀπ' ἀνθῶν τὰ δὲ ἀπὸ φύλλων τὰ δὲ ἀπὸ κλωνὸς τὰ δ' ἀπὸ ῥίζης τὰ δ' ἀπὸ ξύλων τὰ δ' ἀπὸ καρποῦ τὰ δ' ἀπὸ δακρύων. μικτὰ δὲ πάνθ' ὡς εἰπεῖν. ἀπ' ἀνθῶν μὲν οἷον τὸ ῥόδινον καὶ τὸ λευκόϊνον. καὶ τὸ σούσινον· καὶ γὰρ τοῦτο ἐκ τῶν κρίνων· ἔτι δὲ τὸ σισύμβρινον καὶ τὸ ἐρπύλλινον καὶ ἡ κύπρος καὶ πρὸς τούτοις τὸ κρόκινον· βέλτιστος δ' ἐν Αἰγίνῃ καὶ Κιλικίᾳ. ἀπὸ δὲ τῶν φύλλων οἷον τό τε μύρρινον καὶ τὸ οἰνάνθινον· αὕτη δ' ἐν Κύπρῳ φύεται ὀρεινὴ καὶ πολύοδμος· ἀπὸ δὲ τῆς ἐν τῇ Ἑλλάδι οὐ γίνεται διὰ τὸ ἄοδμον.

28 Ἀπὸ ῥιζῶν δὲ τό τε ἴρινον καὶ τὸ νάρδινον καὶ τὸ ἀμαράκινον ἐκ τοῦ κόστου· τοῦτο γὰρ ὀνο-

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[1] *cf.* Diosc. 1. 58.

[2] I have bracketed καὶ as suggested by Sch.

[3] This passage, with some variations, is quoted by Athen. 15. 39.

[4] *cf.* Plin. 13. 11.

[5] *cf. H.P.* 6. 6. 11. for the plant, and for the perfume Athen. 15. 38.

rose-perfume, except that, unless one soon takes out the flowers and squeezes them out, decay sets in and ruins the perfume by giving it a disagreeable smell, since they cause decay as they get soaked. Similar also is the manufacture of quince-perfume[1]: the oil is first made astringent, and is cold when the quinces[2] are put into it: then they take them out before they turn black, removing each batch before the next is put in: for, as they turn black, decay ensues because they get soaked through—just as in the case of *kypros*.

Of the various parts of plants used for perfumes, and of the composition of various notable perfumes.

VI. [3] Perfumes are compounded from various parts of the plant, flowers leaves twigs root wood fruit and gum: and in most cases the perfume is made from a mixture of several parts. Rose and gilliflower perfumes are made from the flowers: so also is the perfume called *susinon*,[4] this too being made from flowers, namely, lilies: also the perfumes named from bergamot-mint and tufted thyme, *kypros*, and also the saffron-perfume; the crocus which produces this is best in Aegina and Cilicia. Instances of those made from the leaves are the perfumes called from myrtle and drop-wort[5]: this grows in Cyprus on the hills and is very fragrant: that which grows in Hellas yields no perfume, being scentless.

[6] From roots are made the perfumes named from iris spikenard and sweet marjoram,[7] an ingredient in which is *koston*; for it is the root to which this name

[6] Instances of perfumes made from twigs seem to be missing. [7] *cf.* 30. Text perhaps defective.

μάζουσι τὴν ῥίζαν. τὸ δὲ χρίσμα τὸ Ἐρετρικὸν ἐκ τοῦ κυπείρου. κομίζεται δὲ ἀπὸ τῶν Κυκλάδων τὸ κύπειρον. ἀπὸ ξύλου δὲ ὁ φοῖνιξ καλούμενος· ἐμβάλλουσι γὰρ τὴν ὀνομαζομένην σπάθην ξηράναντες. ἀπὸ καρπῶν δὲ τό τε μήλινον καὶ τὸ μύρτινον καὶ τὸ δάφνινον· τὸ δ' Αἰγύπτιον ἐκ πλειόνων, ἔκ τε τοῦ κιναμώμου καὶ ἐκ σμύρνης καὶ ἐξ ἄλλων.

29 Ἔτι δ' ἐκ πλειόνων τούτου τὸ μεγαλεῖον· καὶ γὰρ ἐκ κιναμώμου . . . καὶ ἐκ τῆς σμύρνης κοπτομένης ἔλαιον ῥεῖ· στακτὴ γὰρ καλεῖται διὰ τὸ <κατὰ> μικρὸν στάζειν. ὃ δὴ μόνον τινές φασιν ἁπλοῦν εἶναι καὶ ἀσύνθετον τῶν μύρων τὰ δ' ἄλλα πάντα σύνθετα, πλὴν τὰ μὲν ἐκ πλειόνων τὰ δ' ἐξ ἐλαττόνων, ἐξ ἐλαχίστων δὲ τὸ ἴρινον. οἱ μὲν οὖν οὕτω λέγουσιν, οἱ δὲ τὴν ἐργασίαν τῆς στακτῆς εἶναι τοιάνδε· τὴν σμύρναν ὅταν κόψωσι καὶ διατήξωσι ἐν ἐλαίῳ βαλανίνῳ πυρὶ μαλακῷ ὕδωρ ἐπιχεῖν θερμόν· συνιζάνειν δ' εἰς βυθὸν τὴν σμύρναν καὶ τοὔλαιον καθάπερ ἰλύν· ὅταν δὲ τοῦτο συμβῇ, τὸ μὲν ὕδωρ ἀπηθεῖν τὴν δ' ὑπόστασιν ἀποθλίβειν ὀργάνοις.

30 Τὸ δὲ μεγαλεῖον ἐκ ῥητίνης κεκαυμένης συντίθεσθαι καὶ ἐλαίου βαλανίνου· μίγνυσθαι δὲ κασίαν κινάμωμον σμύρναν. πλείστην δὲ πραγματείαν περὶ τὸ μεγαλεῖον καὶ τὸ Αἰγύπτιον εἶναι,

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[1] *cf. H.P.* 9. 7. 3; *C.P.* 6. 11. 13.

[2] *cf. H.P.* 2. 8. 4. *σπάθην* appears to be a conj. of W. for vulg. *πλάτην*: *ἐλάτην* Turn. *cf.* LS. *s.v.*

[3] Said to be called after the inventor, one Megallos: *cf.* Plin. 13. 13.

is applied. The Eretrian unguent is made from the root of *kypeiron*,[1] which is obtained from the Cyclades as well as from Euboea. From wood is made what is called 'palm-perfume': for they put in what is called the 'spathe,'[2] having first dried it. From fruits are made the quince-perfume, the myrtle, and the bay. The 'Egyptian' is made from several ingredients, including cinnamon and myrrh.

Again from several parts of the plant is made the perfume called *megaleion*,[3] which is made from cinnamon and . . . .[4] and from the myrrh when it is bruised flows an oil: it is in fact called *stakte*[5] (in drops) because it comes in drops slowly. Some indeed say that this is the only simple uncompounded perfume, and that all the others are compound, though made from a larger or smaller number of ingredients, and that iris-perfume is made from the smallest number of all. Some assert this, but others declare that the manufacture of *stakte* (myrrh-oil) is as follows: having bruised the myrrh and dissolved it in oil of *balanos* over a gentle fire, they pour hot water on it: and the myrrh and oil sink to the bottom like a deposit; and, as soon as this has occurred, they strain off the water and squeeze the sediment in a press.

Megaleion, these authorities say, is compounded of burnt resin[6] and oil of *balanos*, with which are mixed cassia cinnamon and myrrh. They add that this perfume and the Egyptian are the most troublesome

[4] The end of the account of *megaleion* and the beginning of that of myrrh-perfume seem to be missing. ? Supply καὶ κασίας καὶ σμύρνης.

[5] *cf. H.P.* 9. 4. 10. [6] *cf.* Plin. 13. 7.

πλείστων γὰρ μίξιν καὶ πολυτελεστάτων. τῷ δὲ μεγαλείῳ καὶ τὸ ἔλαιον ἕψεσθαι δέχ' ἡμέρας καὶ δέκα νύκτας, εἶτα οὕτως τὴν ῥητίνην ἐμβάλλεσθαι καὶ τἆλλα· δεκτικώτερον γὰρ ἀφεψηθέν. τὸ δ' ἀμαράκινον τὸ χρηστὸν ἐκ τῶν βελτίστων ἀρωμάτων συντίθεσθαι χωρὶς ἀμαράκου· τούτῳ δ' οὐ χρῆσθαι μόνῳ τῶν ἀρωμάτων τοὺς μυρεψοὺς οὐδ' εἰς ἓν μύρον, ἀλλὰ ψευδώνυμός τις ἡ ἐπίκλησις.

31 Ποιοῦσι δὲ καὶ τὰ μὲν ἀχρωμάτιστα τὰ δὲ κεχρωματισμένα. χρωματίζουσι δὲ ἀμαράκινον ῥόδινον μεγαλεῖον, ἀχρωμάτιστα δὲ τῶν μὲν πολυτελῶν Αἰγύπτιον μήλινον κύπρος, τὰ δ' εὐτελῆ πάντα· ταῦτα δὲ ἀχρωμάτιστα διότι τὸ μὲν Αἰγύπτιον καὶ τὴν κύπρον λευκὰ εἶναι βούλονται, τῷ δὲ μηλίνῳ τὴν τῶν μήλων χρόαν, τοῖς δ' εὐτελέσιν οὐ λυσιτελεῖ τὸ χρῶμα προστιθέναι. χρωματίζουσι δὲ τὰ μὲν ἐρυθρὰ τῇ ἀγχούσῃ, τὸ δ' ἀμαράκινον τῷ καλουμένῳ χρώματι· τοῦτο δ' ἐστὶ ῥιζίον ὃ ἄγουσιν ἐκ τῆς Συρίας.

32 VII. Συνεργεῖν δὲ δοκοῦσι πρὸς τὰς γεύσεις οὐχ αἱ ὀδμαὶ μόνον ἀλλὰ καὶ αἱ δριμύτητες καὶ αἱ θερμότητες ἐνίων, διὸ καὶ τῶν οἴνων τισὶ τὰ τοιαῦτα μιγνύντες ὥσπερ κέντρον ἐμποιοῦσιν. ἔστι δὲ ἡ μὲν σμύρνη θερμὴ καὶ δηκτικὴ μετὰ

to make, since no others involve the mixture of so many and such costly ingredients. To make *megaleion*, they say, the oil is boiled for ten days and nights, and not till then do they put in the resin and the other things, since the oil is more receptive when it has been thoroughly boiled. The superior kind of sweet marjoram-perfume,[1] they say, is made of all the best spices except sweet marjoram: in fact this is the only spice which perfumers do not use for any perfume, and the name is a misnomer.

Some perfumes are made up colourless, some are given a colour. They give a colour to sweet marjoram-perfume, rose-perfume, and *megaleion*, while among expensive kinds the Egyptian, quince-perfume and *kypros* are colourless, as well as all the cheaper kinds. The reason why these are made without colour is that it is desired that the Egyptian and *kypros* should look white and that quince-perfume should have the colour of quinces, while it is not worth while to add colour to the cheaper sorts. The dye used for colouring red perfumes is alkanet; the sweet marjoram-perfume is dyed with the substance called *khroma* (dye), which is a root imported from Syria.

Of the properties of various spices.

VII. It is thought that not only the smells of perfumes contribute to a pleasant taste, but also the qualities of pungency and heat which are found in some of them: accordingly some of these perfumes are also mixed with certain wines to give, as it were, 'point' to them. Thus myrrh is hot and has a biting quality as well as being astringent, and it also

[1] Clearly distinct from that mentioned in 28.

στύψεως, ἔχει δὲ καὶ πικρίαν. τὸ δὲ κινάμωμον δριμύτητά τινα μετρίαν μετὰ θερμότητος. παραπλησίως δὲ καὶ τὸ κόστον. ἡ δὲ κασία τούτων ὑπερβάλλει θερμότητι καὶ δριμύτητι καὶ στύψει. θερμὴ δὲ καὶ στυπτικὴ καὶ ἡ ἶρις, καθ' ὑπερβολὴν δὲ καὶ πικρὰ νέα οὖσα καὶ τὸν χρῶτα τῶν ἐργαζομένων ἀφελκοῖ. δηκτικὸν δὲ καὶ τὸ καρδάμωμον μετὰ θερμότητος. τοῦ δὲ βαλσάμου ὁ μὲν ὀπὸς καὶ τὸ καρπίον ἀνδρικώτερα πρὸς ἀμφότερα ταῦτα, τὸ δὲ ξύλον ἀσθενέστερον. παραπλησίαν δ' ἔχει τούτῳ δύναμιν καὶ τὸ ἄμωμον.

33 Ὁ δὲ σχοῖνος δηκτικώτερον μὲν τοῦ καλάμου καὶ θερμότερον, στυπτικὰ δὲ ὁμοίως ἄμφω. τούτων δὲ στυπτικώτερον τὸ κύπειρον. στύφει δὲ καὶ ἡ ἀσπάλαθος ἡ εὐώδης. ἡ δὲ νάρδος δηκτικὴ μετὰ θερμότητος. τὸ δὲ μάρον καὶ τὸ χρῶμα τὸ εἰς τὸ ἀμαράκινον ἐμμιγνύμενον θερμαντικά. [συνεργεῖ δὲ καὶ τῆς ἀγχούσης τὸ ῥιζίον εἰς τὴν χρόαν τοῦ ῥοδίνου καὶ τῆς ἴριδος.]

34 Νέα μὲν οὖν ὄντα τῶν ἀρωμάτων ἔνια δυνάμεις μὲν εὐθὺς ἔχει βαρείας καὶ δριμείας, παλαιούμενα δὲ μέχρι τῆς ἀκμῆς γλυκαίνεται, εἶτ' ἀναλύεται πάλιν. οἷον ἡ ἶρις εἰς μὲν τὴν ἐργασίαν ἀκμάζει μετὰ τὴν συλλογὴν τρία ἔτη, καὶ διαμένει δὲ πλεῖστον χρόνον ἓξ ἔτη. τὸ δὲ μάρον ἔτη δύο. ἡ δὲ σμύρνα δέκα ἔτη διαμένει βελτίων γενομένη. παραπλησίως δὲ τούτοις ἡ τῆς ἀκμῆς διαμονὴ καὶ τοῦ κιναμώμου καὶ τοῦ κόστου καὶ τῆς κασίας. σχοῖνος δὲ καὶ κάλαμος παρακμάζει ταχύ. τῶν δ' ἀνθῶν τὰ μὲν εὐθὺς χλωρὰ ὄντα

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[1] *cf.* Plin. 21. 42. [2] *cf.* Index, *σχοῖνος* (2).
[3] *cf.* Index, *κάλαμος ὁ εὐώδης.*

has a bitter quality. Cinnamon again has a fair amount of pungency as well as heat. So too is it with *koston*. Cassia exceeds both of these in heat pungency and astringency. Iris-perfume is hot and astringent, and excessively bitter when it is fresh, [1] in which state it causes sores on the skin of those that work on it. Cardamom has also a biting quality as well as heat. The juice and the fruit of balsam of Mecca are more active in producing both these qualities, while the wood is less so. Nepaul cardamom has also a property similar to this.

Ginger-grass [2] has a more biting quality than sweet-flag,[3] and is hotter; but both are equally astringent. *Kypeiron* is however more astringent than either. The sweet-scented *aspalathos* also has this quality. Spikenard has a biting quality as well as heat. *Maron* and the *khroma* which is mixed with sweet marjoram-perfume are heating. [4] The root of alkanet also contributes to the colour of rose-perfume and iris-perfume.

Now some spices when they are fresh have at first heavy and pungent qualities, but in course of time become sweet till they have reached their prime, and then lose their properties again. Thus the iris is at its prime for manufacturing the perfume for three years after it was gathered, and [5] lasts for six years at longest.[5] *Maron* lasts two years; myrrh ten, and improves with time. Cinnamon *koston* and cassia keep at their best for about the same periods as these. Ginger-grass and sweet-flag soon get past their prime. Of flowers some, like the rose, possess

[4] This sentence seems irrelevant here.

[5–5] *καὶ—ἔτη*. These words are omitted, apparently by accident, in both W.'s editions, though represented in his Latin translation.

τὰς δυνάμεις ἔχει, καθάπερ τὸ ῥόδον, τὰ δὲ ξηρανθέντα, καθάπερ ὁ κρόκος καὶ ὁ μελίλωτος· χλωρὰ γὰρ ὑγρότερα.

35 Τὰς μὲν οὖν φύσεις καὶ δυνάμεις τῶν ἀρωμάτων ἐκ τούτων θεωρητέον.

VIII. Δοκεῖ δὲ τὸ μεγαλεῖον ἀφλέγμαντον εἶναι παντὸς τραύματος· τὸ δὲ ῥόδινον ἄριστον πρὸς τὰ ὦτα. ταῦτα δ' οὐκ ἀλόγως. τοῦ μὲν γὰρ ἡ σύνθεσις ἐκ ῥητίνης κεκαυμένης, ὥσπερ ἐλέχθη, καὶ κασίας καὶ κιναμώμου καὶ σμύρνης, ἅπαντα δὲ ταῦτα στυπτικὰ καὶ ξηραντικά. τὸ δὲ ῥόδινον τοῖς ὠσὶν ἀγαθὸν ὅτι ἐν ἅλσιν ἡ ποίησις· ἀναξηραίνει γὰρ καὶ ἐκθερμαίνει διὰ τοὺς ἅλας· διὸ καὶ ἡ ἁλοσάχνη ἀγαθόν. ἀλλὰ τὸ τῆς στραγγουρίας λόγου δεῖται· καὶ γὰρ ταύτῃ λέγουσι μάλιστα βοηθεῖν. αἴτιον δ' ἂν εἴη διότι πᾶν τὸ ὑπεξάγειν μέλλον ἀναλῦσαι δεῖ πρότερον τὸ ὑπεξαχθησόμενον· τοῦτο δὲ οἱ ἅλες ποιοῦσιν, ἡ δ' εὐωδία τὴν ὁρμὴν ἀπέδωκε.

36 Διὰ τί δὲ τὸ ἴρινον εὔοσμον μὲν οὐ ποιεῖ δὲ τὴν ὁρμήν; ἢ διότι στυπτικὸν καὶ συνάγει τοὺς πόρους, ὥστε συγκλείσει κωλύειν τὴν δίοδον; ἀλλὰ καὶ κοιλίας λυτικὴ διά τε τὴν θερμότητα καὶ διὰ τὸ ἀποστύφειν τοὺς ἐπὶ τὴν κύστιν πόρους· ἀποκλειομένων γὰρ τούτων εἰς τὴν κοιλίαν ἡ συρροή. τὸ δὲ ὅλον φαρμακῶδες καὶ

[1] *cf. C.P.* 6. 14. 8 and 11.

their virtues from the first while they are still fresh, some only after they are dried, as crocus and *melilotos*,[1] these having a certain amount of moisture while they are fresh.

These examples may suffice for study of the characters and properties of spices.

Of the medicinal properties of certain perfumes.

VIII. *Megaleion* is believed to relieve the inflammation caused by any wound, and rose-perfume to be excellent for the ears. And this is probable enough. For the former is composed, as was said, of burnt resin cassia cinnamon and myrrh, and all these have astringent and drying properties: while the reason why rose-perfume is good for the ears is that salt is used in the manufacture of it: for it is by reason of the salt that it dries and warms (which is why 'sea-foam [2]' is also good for the ears). Its use against strangury however needs explanation: for it is said to be specially helpful against this. The explanation may be that anything which is to remove the difficulty must first dissolve that which is to be removed; and this is the effect of the salt, while the fragrance supplies the necessary stimulus.

Why however, it may be asked, though iris-perfume is fragrant, does it not give the stimulus? Perhaps it is because it is astringent and closes the passages, so that by shutting them it prevents free course. On the other hand this perfume acts as a laxative on the bowels because of its heating quality and because it astringes the passages leading to the bladder: for, when these are closed, the liquid collects in the bowels. In general iris-

[2] Said to be a zoophyte: *cf.* Arist. *H.A.* 9. 14. 2.

τὸ ἴρινον καὶ ἄλλα τῶν μύρων. ἡ δ' αἰτία πάντων ὡς καθόλου εἰπεῖν ἐν ταῖς δυνάμεσι ταῖς εἰρημέναις, ὅτι στυπτικὰ καὶ θερμαντικά· τὰ ἀρώματα γὰρ τὰ τοιαῦτα φαρμακώδη. ταῦτα μὲν οὖν ἔξω τῆς τέχνης.

37 IX. Κρᾶσις δὲ καὶ μῖξις οὐκ ἔστιν ὡρισμένη τῶν ἀρωμάτων, ὥστ' ἐκ τῶν αὐτῶν ἀεὶ χρηστὰ καὶ ὅμοια γίνεσθαι, ἀλλοῖα δὲ συμβαίνει διὰ τὴν ἀνωμαλίαν τῶν δυνάμεων τῶν ἐν τοῖς ἀρώμασι. τῆς δ' ἀνωμαλίας αἰτίαι πλείους. μία μέν, ἥπερ καὶ τοῖς ἄλλοις καρποῖς, ἡ τοῦ ἔτους κατάστασις· αὕτη γὰρ πολυχουστέρας ὁτὲ δ' ἀσθενεστέρας τὰς δυνάμεις <ποιεῖ>. ἑτέρα δὲ ἐν τῇ συλλογῇ, τὸ προτερῆσαι τῆς ἀκμῆς ἢ ὑστερῆσαι· καὶ γὰρ τοῦτο οὐ μικρὸν διαφέρει. τρίτη δ' ἡ μετὰ τὴν συλλογήν, ὅσα χρόνου δεῖται πρὸς τὴν ἀκμήν, ὥσπερ ἐλέχθη· καὶ γὰρ ἐνταῦθά ἐστι τὸ προτερεῖν καὶ ὑστερεῖν.

38 Τούτων δὲ τὸ μὲν τῶν ἐτῶν οὐκ ἐφ' ἡμῖν, πλὴν εἰς τὸ εἰδέναι τὰ ποῖα σφοδροτέρας καὶ ἀσθενεστέρας ἔχει τὰς δυνάμεις· τὰ δὲ κατὰ τὰς ἀκμὰς τῆς τε συλλογῆς καὶ μετὰ τὴν συλλογὴν ἐφ' ἡμῖν ἐστί, τῷ εἰδότι μᾶλλον τὸ ἐπιτυγχάνειν.

Ἡ μὲν οὖν γένεσις καὶ σύνθεσις τῶν μύρων ἐκ τούτων.

perfume, as well as others, has medicinal properties. And the explanation in all cases, to put it generally, lies in the above-mentioned properties of astringency and heating; for it is spices possessing these properties that are medicinal. However these matters lie outside our subject of study.

Of rules for the mixture of spices, and of the storing of various perfumes.

IX. There is no fixed rule for the combination and mixture of spices in the sense that the same components will always produce a satisfactory and a uniform result: the result varies by reason of the varying quality of the virtues found in the spices. For this there are several reasons. One, which applies also to fruits, is the character of the season; this causes the virtues to be sometimes much more than ordinarily powerful, sometimes less so. Another is to be found in the time of collection, according as it is made before or after the spices are in their prime. A third cause operates after the collection, that is, in the case of those spices which need time to come to their prime, as was said [1]: for here too it is possible to be too soon or too late.

Of these causes that which depends on the seasons is not within our control, except so far as we can discover which spices in a particular season have powerful, and which weak virtues.[2] But we can control those which depend on collecting them when in their prime, or on keeping them after they are collected, that is, if we know pretty well how to hit the right moment.

So much for the origin and composition of perfumes.

[1] 34. [2] *i.e.* and we can select accordingly.

Πολυχρονιώτατον δ' ἐστὶ τό τ' Αἰγύπτιον καὶ τὸ ἴρινον καὶ τὸ ἀμαράκινον καὶ τὸ νάρδινον, πάντων δὲ μάλιστα ἡ στακτή, διαμένει γὰρ ὁποσονοῦν χρόνον. μυροπώλης δέ τις ἔφη παρ' αὐτῷ μεμενηκέναι Αἰγύπτιον μὲν ὀκτὼ ἔτη, ἴρινον δὲ εἴκοσι, καὶ ἔτι διαμένειν βέλτιον ὂν τῶν ἀκμαζόντων. ἡ μὲν οὖν χρονιότης ἐν τούτοις.

39 Τὰ δ' ἄνθινα πάντα ἀσθενῆ. συμβαίνει δὲ τοῖς ἀνθίνοις ἀκμάζειν μὲν ὡς ἐπὶ τὸ πᾶν μετὰ δίμηνον, μεταβάλλειν δ' ἐπὶ τὸ χεῖρον ἐνιαυτοῦ προελθόντος καὶ περικαταλαβούσης τῆς ὥρας ἐν ᾗ τὴν ἀκμὴν λαμβάνει τὸ ἄνθος. ἀνὰ λόγον δὲ τῇ ἀσθενείᾳ καὶ τὸ εὐπέπαντα εἶναι καὶ ὅλως εὐδιάπνευστα· τὰ δ' ἐκ τῶν ῥιζῶν καὶ τῶν λοιπῶν χρονιώτερα· πλείων γὰρ ἡ ὀσμὴ καὶ ἰσχυροτέρα καὶ σωματωδεστέρα.

40 Διαφθείρει δὲ τὰ μύρα καὶ ὥρα θερμὴ καὶ τόπος καὶ ὁ ἥλιος, ἂν τεθῶσι· διὸ καὶ οἱ μυροπῶλαι ζητοῦσι τὰς οἰκίας ὑπερῴους καὶ μὴ προσηλίους ἀλλ' ὅτι μάλιστα παλισκίους· ἀφαιρεῖται γὰρ τὰς ὀσμὰς ὁ ἥλιος καὶ τὸ θερμὸν καὶ ὅλως ἐξίστησι τῆς φύσεως μᾶλλον τοῦ ψυχροῦ· τὸ δὲ ψυχρὸν καὶ ὁ πάγος, εἰ καὶ ἀοσμότερον ποιεῖ διὰ τὸ συστέλλειν, ἀλλ' οὐκ ἀφαιρεῖταί γε τὴν δύναμιν τελέως. ἡ πονηρὰ γὰρ φθορά, καθάπερ τῶν οἴνων καὶ τῶν ἄλλων χυλῶν, τῷ
41 τὸ οἰκεῖον ἀφαιρεῖσθαι θερμόν. διὸ καὶ εἰς ἀγγεῖα μολυβδᾶ ἐγχέουσι καὶ τοὺς ἀλαβάστρους ζητοῦσι τοιούτου λίθου· ψυχρὸν γὰρ καὶ πυκνὸν καὶ ὁ

Those which last longest are the Egyptian, the iris, the sweet marjoram and the spikenard perfumes: but myrrh-oil has the longest life of any; for it will keep any time. A certain perfumer said that he had had Egyptian perfume in his shop for eight years, and iris-perfume for twenty, and that it was still in good case, in fact better than fresh perfume. These are instances of perfumes which will keep a long time.

On the other hand all those made from flowers have little vigour. These are usually at their best after two months, but they deteriorate when a year has past and the season has come round again at which the flowers are at their best. Also, as these perfumes lack vigour, so also do they quickly mellow, and, in most cases, quickly evaporate. Those made from roots and the other parts of the plant last longer, their odour being fuller stronger and more substantial.

Perfumes are ruined by a hot season or place or by being put in the sun. This is why perfumers seek upper rooms which do not face the sun but are shaded as much as possible. For the sun or a hot place deprives the perfumes of their odour, and in general makes them lose their character more than cold treatment: while cold and frost, even if they make them less odorous by congealing them, yet do not altogether deprive them of their virtue. For the most destructive thing that can happen to them, as to wines and other savours, is that they should be deprived of their proper heat. This is why men put them into vessels of lead and try to secure phials of alabaster—a stone which has the required effect: for lead is cold and of close texture, and stone has

μόλυβδος καὶ ὁ λίθος ὁ τοιοῦτος· καὶ ἄριστος τοῖς μυροις ὁ μάλιστα τοιοῦτος. ὥστε δι' ἄμφω τηροῦσι, καὶ τῷ ψυχρῷ καὶ τῷ πυκνῷ, μήτε διιέντες ἔξω τὴν ὀσμὴν μήθ' ὅλως ἐπιδεχόμενοι μηδέν. καὶ γὰρ ἡ ἀναπνοὴ φθείρει καὶ τὸ ἔξωθεν ἐπεισιὸν καὶ ἀλλότριον· ἐπεὶ καὶ τὰ πνεύματα φθείρει καὶ καταναλίσκει, καθάπερ ἐλέχθη, τὰς ὀσμάς, ἄλλως τε καὶ τὰς μὴ φυσικάς.

42 X. Κεφαλαλγῆ δὲ τῶν μὲν πολυτελῶν τὸ ἀμαράκινον καὶ τὸ νάρδινον καὶ μεγαλεῖον, τῶν δ' εὐτελῶν ὅλως μὲν τὰ πλεῖστα μάλιστα δὲ τὸ δάφνινον. ἐλαφρότατα δὲ τὸ ῥόδινον καὶ ἡ κύπρος, ἃ καὶ τοῖς ἀνδράσι μάλιστα ἁρμόττειν δοκεῖ, καὶ πρὸς τούτοις τὸ κρίνον· ταῖς δὲ γυναιξὶν ἡ στακτὴ καὶ τὸ μεγαλεῖον καὶ τὸ Αἰγύπτιον καὶ τὸ ἀμαράκινον καὶ τὸ νάρδινον· διὰ γὰρ τὴν ἰσχὺν καὶ τὸ πάχος οὐκ εὐαπόπνοα οὐδ' εὐαφαίρετα· ζητοῦσι <γὰρ> τὰ χρόνια.

43 Ἐπεὶ δὲ τὰ μὲν ἀσθενῆ τὰ δ' ἰσχυρά, καὶ ἰσχυρότερα τὰ ἀπὸ τῶν ῥιζῶν καὶ τὰ ἄλλα τὰ προειρημένα, διὰ τοῦτο τὰ μὲν ἄνθινα μὴ τριβόμενα εὐοσμότερα, τὰ δ' ἀπὸ τῶν ῥιζῶν καὶ τὰ λοιπὰ τριβόμενα· τὰ μὲν γὰρ διαπνεῖταί τε καὶ ἅμα διαθερμαινόμενα διὰ τὴν τρῖψιν ἐξίσταται καὶ ἀλλοιοῦται, τὰ δὲ διὰ τὴν ἰσχὺν

[1] *e.g.* alabaster, which here at least is spoken of as a kind of stone. [2] γὰρ ins. Sch.

the same character, that being the best for keeping perfumes which has it in the highest degree.[1] So that vessels made of these materials keep the perfume well for both reasons, their coolness and their closeness of texture: they neither let the odour pass away through them, nor do they take in anything else. For evaporation destroys the perfume, and so also does any foreign substance which finds its way in: for even draughts of air destroy odours and cause them to waste, as was said, especially those odours which do not belong to a thing's essential nature.

Of the properties of certain perfumes.

X. Headache is caused by sweet marjoram spikenard and *megaleion* among costly perfumes: most of the cheap ones have also this effect, notably that made from bay. The lightest are rose-perfume and *kypros*, which seem to be the best suited to men, as also is lily-perfume. The best for women are myrrh-oil, *megaleion*, the Egyptian, sweet marjoram, and spikenard: for these owing to their strength and substantial character do not easily evaporate and are not easily made to disperse, and [2] a lasting perfume is what women require.

Inasmuch however as some perfumes are stronger than others, the stronger being those made from roots and the others already mentioned, for this reason those derived from flowers are more fragrant if they are not bruised, while bruising improves those made from roots and the others. For the former kind evaporate and pass off as they are warmed by the bruising, thus losing their character, while the latter owing to their strength have, as it

ὥσπερ ἀνοιγομένων τινῶν πόρων ἐκ τῆς τρίψεως
44 ἐμφανεστέραν ποιεῖ τὴν ὀσμήν. ὃ καὶ ἐπ᾽ αὐτῶν τῶν ῥιζῶν καὶ ὅλως τῶν στερεῶν συμβαίνει, καθάπερ ἐλέχθη. κατὰ δὲ τῶν ἀνθῶν ἐναντίως, ὥστε ἠκολούθηκεν ἑκάτερα τῇ ἀρχῇ. τὰ δ᾽ ἐκ τῆς σμύρνης εὐλογώτατα δι᾽ ἄμφω· καὶ γὰρ μίγνυται μᾶλλον καὶ <ἡ> θερμότης ἡ τῆς τρίψεως οὐκ ἀλλοτρία, μαλακή τις οὖσα· καὶ γὰρ <ἡ> σμύρνα ζητεῖ τινα πύρωσιν. ἁπλῶς δὲ πᾶν τὸ πολύοδμον ἄντ᾽ εὐῶδες ἄντε κακῶδες ἄντε δριμὺ ἄντ᾽ ὀξὺ ἄντ᾽ ὁποιονοῦν τυγχάνῃ, κινούμενον ἐμφανέστερον· τότε γὰρ ὥσπερ ἐνεργείᾳ ἀναμίγνυται μᾶλλον τῷ ἀέρι.

Τῶν δὲ μύρων τὸ Αἰγύπτιον καὶ ἡ στακτὴ καὶ εἴ τι ἄλλο πολύοδμον [καὶ] μιγνύμενα τῷ οἴνῳ τῷ εὐώδει ἡδίω· παραιρεῖται γὰρ ἡ βαρύτης αὐτῶν· ἐπεὶ καὶ ἡ σμύρνη αὐτὴ πρὸς τὴν ἀναθυμίασιν βρεχθεῖσα ἐν τῷ γλυκεῖ, καθάπερ ἐν τοῖς πρότερον ἐλέχθη.

45 Πρὸς δὲ τὰς δυνάμεις σκοπουμένοις δόξειεν ἂν ἄτοπον εἶναι τὸ συμβαῖνον ἐπὶ τοῦ ῥοδίνου· κουφότατον γὰρ ὂν καὶ ἀσθενέστατον ἀφανίζει τὰς τῶν ἄλλων ὀσμὰς ὅταν προμυρισθῶσι· διὸ καὶ οἱ μυροπῶλαι τοὺς ἐπιδιστάζοντας καὶ μὴ ὠνουμένους παρ᾽ αὐτῶν ἐπιμυρίζουσι τούτῳ πρὸς τὸ μὴ αἰσθάνεσθαι τὰ παρὰ τῶν ἄλλων. αἴτιον δ᾽ ὅτι λεπτότατον ὂν καὶ προσφιλὲς τῇ αἰσθήσει διὰ τὴν κουφότητα μάλιστα διικνεῖται καὶ συμ-

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[1] ἡ ins. W. [2] ἡ ins. W.

[3] The words ἄντε δριμὺ are omitted in both W.'s editions, but represented in his Latin version.

were, certain passages opened by the bruising, and so their fragrance is made more obvious. This, as was said, also takes place in the case of the roots themselves and of the solid things in general; but the result in the case of flowers is just the opposite, so that both kinds behave according to their origin. That this should apply to the perfumes made from myrrh is quite natural for both reasons; they mingle more than others with the air, and the heat[1] due to the bruising is not prejudicial, since it is gentle, and myrrh[2] in fact requires a certain amount of heating. And in general any strong odour, whether it be pleasing or the reverse, whether it be pungent[3] or sharp, or whatever its character, becomes more pronounced with movement; for then it becomes, as it were, active and mingles more with the air.

The Egyptian perfume, myrrh-oil, and any others that have a strong odour become[4] sweeter if they are mixed with fragrant wine; for then their heavy quality is removed. In fact myrrh itself is made to exhale a more fragrant odour by being steeped in sweet wine, as was said[5] in a former treatise.

If one has regard to the virtues of the perfumes in question, one may well be surprised at what happens in the case of rose-perfume:—though it is lighter and less powerful than any other, if one has first been scented with it, it destroys the odour of the others. And this is why perfumers, if a purchaser hesitates and is not inclined to buy this perfume, scent him with it so that he is not able to smell the others. The explanation is that, being very delicate and acceptable to the sense of smell, by reason of its lightness it penetrates as no

[4] I have bracketed καὶ. [5] *C.P.* 6. 17. 2.

πληροῖ τοὺς πόρους, ὥσθ' ἡ αἴσθησις κατειλημ-
46 μένη καὶ πλήρης οὖσα κρίνειν ἀδυνατεῖ. δύο γάρ εἰσι τρόποι, τάχα δὲ τρεῖς, οἱ κωλύοντες τὴν κρίσιν. εἷς μὲν ὁ νῦν εἰρημένος· ἄλλος δ' ὁ ἀπὸ τῶν ἰσχυρῶν ὥσπερ μεθύσκων τὴν αἴσθησιν καὶ καρηβαρᾶν ποιῶν· τρίτος δ' ὅταν προκαταληφθῇ τῷ βελτίονι· τὸ γὰρ ἐπεισάγειν τὸ χεῖρον οὐ ῥᾴδιον· οὐ δέχεται γὰρ ἡ αἴσθησις, ὥσπερ οὐδ' ἐπὶ τῶν χυλῶν καὶ ὅλως τῶν κατὰ τὴν τροφήν.

47 Κατισχναίνειν δὲ δοκεῖ τὸ ῥόδον καὶ τὴν σύνθετον ὀσμήν· ὅταν γὰρ ἀκμάζῃ τὸ ἄνθος, ῥοδίζουσι τὰς συνθέσεις, ἀνοιγόμεναι δ' ἐξόζουσι τούτου μόνου καὶ μάλιστα. παύεται δὲ ταχὺ καὶ λήγει διὰ τὴν ἀσθένειαν καὶ λεπτότητα, δι' ἣν καὶ ἐξόζει τῶν ἄλλων· λεπτὴ γὰρ οὖσα ἡ ἀναπνοὴ καὶ ἠθροισμένη τῇ κατακλείσει προτερεῖ τε τῶν λοιπῶν καὶ διαδίδοται πανταχοῦ. διὰ ταὐτὸ δὲ τοῦτο καὶ ἀπολήγει ταχὺ καὶ κατακρατεῖται πάλιν· ἀσθενεῖ γὰρ τὸ λεπτὸν καὶ μαλακόν.

48 Ποιοῦσι δέ τινες τοῦτο καὶ τῶν οἴνων, ὥστε προποθέντες ἀφανίζειν τὴν τῶν ἄλλων ἡδονήν. ἔνιοι δ' ὥστε μὴ ἐπιδέχεσθαι ῥᾳδίως τοὺς ἄλλους,

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[1] *cf.* 57, 58. *σύνθετος ὀσμή* or *σύνθεσις* seems to mean a kind of pot-pourri, which was from time to time renewed with fresh rose-petals. Sch. understands *σύνθεσις* to mean 'clothes in a wardrobe' (*cf.* Lat. *synthesis*), but it must surely have the same meaning here as *σύνθετος ὀσμή*: Sch.'s citation from 57 does not seem to prove his point, and *μένουσι πολὺν χρόνον αἱ συνθέσεις* in 58 is conclusive against him. *cf.* also 69.

other can and fills up the passages of the sense, so that being entirely taken up and filled with it, it is unable to judge of others. For the power of judging is inhibited in two, or possibly in three ways; one is that which has just been mentioned; another is that the sense of smell is, as it were, intoxicated with its powerful virtues and becomes stupefied: the third is that the sense may be preoccupied with the superior odour; for then it is not easy to introduce after it what is inferior, since the sense of smell refuses this—just as the sense of taste in like case refuses flavours and foods in general.

It is also thought that the rose even weakens the effect of compound perfume[1]; for, when the flower is at its best, they treat compound perfumes with it; and, when these come to be opened, they smell only or chiefly of rose. However this effect is only temporary and transient because of the weakness and delicacy of the rose-scent, (the very quality which also causes it to assert[2] itself over the scent of the other ingredients). For, as it is so delicate and is compressed by confinement, it is exhaled before the others and disperses in all directions. It is also for this reason that the rose-scent only asserts itself for a short time and then is overpowered again; for anything that is delicate and subtle must be lacking in vigour.

Certain wines have also a similar effect: if they are first drunk, there is no satisfaction in others. Some again make it even difficult to take others

[2] *i.e.* when the pot-pourri is first opened: the 'delicacy' of the rose-scent causes it to be given off quickly and so (1) to be the first scent perceived, (2) to be volatile. ἐξόζω in this passage is used with gen. in two distinct senses.

ὥσπερ ὁ Ἐρυθραῖας ἁλυκός τις ὢν καὶ μαλακός. τὴν αἰτίαν <δὲ> πειρατέον ἐκ τῶν ὁμοίων λαμβάνειν· ἔχει δὲ τοῦτ' ἴδιον τὸ ῥόδινον, ὥσπερ σχεδὸν καὶ μικρῷ πρότερον εἴρηται· τὰ μὲν γὰρ ἄλλα πάντ' ἢ τὰ πλεῖστα κεφαλαλγῆ, τοῦτο δέ, ὥσπερ ἐλέχθη, λυτικὸν καὶ βάρους καὶ ἀλγηδόνος καὶ τῆς ἀπὸ τῶν μύρων.

49 Ἡ δ' αἰτία φανερὰ διὰ τῶν προειρημένων, εἴπερ ἐπικρατεῖ καὶ διαδύεται πανταχοῦ. τὰ μὲν γὰρ ἄλλ' ὅσα κεφαλαλγῆ βαρέα διὰ τὸ ἐκ τοιούτων συγκεῖσθαι τὰ μὲν ῥιζῶν τὰ δ' ὀπῶν· τοῦτο δὲ καὶ τῇ ὀσμῇ ἐλαφρὸν καὶ τῇ θερμότητι σύμμετρον εἰς τὸ συμπέψαι καὶ διανοῖξαι τοὺς πόρους. οἱ γὰρ δὴ πόνοι τῆς κεφαλῆς ἢ καθυγραινομένης ἢ πνευματουμένης τῷ ἐναπολαμβάνεσθαι, ὥστε τὸ μὲν ἐκκρῖναι δεῖ τὸ δὲ πέψαι ἢ ἀφελεῖν.

50 Πρὸς ἅπαντα δὲ ἡ θερμότης χρήσιμον, καὶ εἰς ἀφαίρεσιν καὶ ἔτι μᾶλλον εἰς τὸ πέττειν καὶ διανοίγειν τοὺς πόρους, εἰς ἃ συμβάλλεται τὸ ἐν τῷ ἁλὶ πεποιῆσθαι· καὶ γὰρ ἀναστομοῦσι καὶ διαθερμαίνουσιν οἱ ἅλες. ἡ δ' εὐοσμία καὶ ὁρμήν τινα ποιεῖ πρὸς τὴν κίνησιν. ἀγαθὸν δὲ καὶ δοκεῖ πρὸς τοὺς κόπους εἶναι τῇ θερμότητι σύμμετρον ὂν καὶ τῇ κουφότητι καὶ τῇ διαδύσει πρὸς τοὺς ἐντὸς πόρους· ὡς δέ τινές φασιν, οὐχ ἧττον ἡ κύπρος ἔτι τούτου· μαλακὴ γὰρ ἡ ὀσμὴ καὶ

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[1] *cf.* 52. [2] δὲ ins. W.

[3] *i.e.* the case is so far analogous to that of rose-perfume; but the comparison does not hold as to what follows.

after them; this is the effect for instance of wine of Erythrae,[1] which has a taste of brine and is subtle. The[2] explanation one must endeavour to find by comparing analogous cases.[3] However there is one peculiarity which as we have already more or less indicated, is possessed by rose-perfume only; while all or most of the others are heady, this, as was said, gives actual relief from heaviness and discomfort, even from that caused by other perfumes.

The reason for this is plain in view of what has been already said, seeing that this perfume overpowers others and penetrates everywhere. For the others that are heady are heavy because they are made of heavy substances, whether roots or juices; while this perfume is both light as to its scent and also by its heat well adapted to bring the passages to a suitable temperature and to open them. For pains in the head are due to an excess of moisture in it, or of air which gets confined in it, so that it is necessary to get rid of the one, and to raise the temperature of the other or to remove it.

And for all such purposes heat is useful, both for removing the moisture or air, and, still more, for raising the temperature of the passages and opening them: and to these ends it is helpful that the perfume should have been prepared with salt, since the effect of salt is to open the passages and to warm them thoroughly. Again the fragrance also supplies a stimulus to movement. This perfume is also considered to be good against lassitude, because its heat and its lightness make it suitable, and also because it penetrates to the inner passages. Some however say that *kypros* is quite as efficacious: for this too has a delicate scent which is grateful to the

προσφιλὴς τῷ χρωτὶ καὶ ἡ ταύτης. καὶ ταῦτα μὲν καὶ τὰ ὅμοια τούτοις ὥσπερ ἴδια ἂν εἴη.

51 XI. Τοῦ ῥοδίνου δὲ αἱ μίξεις καὶ ἐν ταῖς ὀσμαῖς καὶ ἐν τοῖς χυμοῖς, ἐὰν ἡρμοσμέναι τυγχάνωσιν, ἔχουσί τινα χρείαν, αἱ μὲν ἀφαιροῦσαι τὴν βαρύτητα καὶ τὴν ἰσχύν, αἱ δ' εὐοδμίαν τινὰ αἱ δὲ γλυκύτητα ἐμποιοῦσαι, καθάπερ καὶ ἐπὶ τῶν οἴνων. καὶ γὰρ ὁ ἐν Θάσῳ ὁ ἐν τῷ πρυτανείῳ διδόμενος, θαυμαστός τις ὡς ἔοικε τὴν ἡδονήν, ἠρτυμένος ἐστίν· ἐμβάλλουσι γὰρ εἰς τὸ κεράμιον σταῖς μέλιτι φυράσαντες, ὥστε τὴν μὲν ὀσμὴν ἀπ' αὐτοῦ, τὴν δὲ γλυκύτητα ἀπὸ τοῦ σταιτὸς λαμβάνειν τὸν οἶνον.

52 Συμβαίνειν δὲ τοῦτο καὶ κατὰ τὰς τῶν οἴνων μίξεις· οἷον ἐάν τις κεράσῃ σκληρὸν καὶ εὔοσμον μαλακῷ καὶ ἀόσμῳ, καθάπερ τὸν Ἡρακλεώτην καὶ τὸν Ἐρυθραῖον, τοῦ μὲν τὴν μαλακότητα τοῦ δὲ τὴν εὐοσμίαν παρεχομένου· συμπίπτει γὰρ ἅμα τὰ κακὰ ἀλλήλων ἀφανίζειν τῇ μαλακότητι θατέρου <καὶ τῇ εὐοσμίᾳ θατέρου>. πολλὰς δὲ καὶ ἄλλας οἱ ἔμπειροι λέγουσι καὶ ἴσασι μίξεις. ὃ καὶ ἐπὶ τῶν ὀσμῶν εὔλογον συμβαίνειν, καὶ ἐπὶ τῶν χρωμάτων ἄν τις λαμβάνῃ τὰς ἁρμοττούσας μίξεις. τοῦτο μὲν οὖν ἴδιον τοῦ ῥοδίνου.

53 Τὸ δὲ κοινὸν ἐπὶ πάντων ἀπόρημα, τί δή ποτε

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[1] Quoted by Athen. 1. 58. [2] *cf.* 48.

[3] This sentence must be defective: as it stands, the effect of only one wine is given, though the effect is said to be

skin. These and similar properties may be considered peculiar to these particular perfumes.

Of other properties and peculiarities of perfumes.

XI. The admixture of rose-perfume, whether in scents or in flavours, if it be well blended, is beneficial, in the one case by removing the heaviness and strength of the scent, in the other by imparting a fragrant scent or a sweet taste to the flavour, as in the case of wines. [1] Thus the wine which is served in the town-hall of Thasos, which appears to be of wonderfully delightful quality, is thus flavoured. For they put into the jar a lump of dough which has been kneaded up with honey, so that the wine gets its fragrance from itself, but its sweet taste from the honeyed dough.

This result also follows, it is said, from the mixture of different wines,—for example, if a strong fragrant wine be mixed with one that is mild and without fragrance, (for instance, if wine of Heraclea be mixed with wine of Erythrae),[2] since the latter contributes its mildness and the former its fragrance: [3] for the effect is that they simultaneously destroy one another's inferior qualities through the mildness of the one and the fragrance of the other. There are many other such blends mentioned by and known to experts. And it is quite to be expected that such a result should follow from blending odours, as it does from blending colours, if one discovers the suitable combinations. This then is peculiar to rose-perfume.

However there is one question which applies to all perfumes, namely, why it is that they appear to

mutual. I have added *καὶ τῇ εὐοσμίᾳ θατέρου* after Sch.; his text however is *συμπίπτει γὰρ ἅμα, καὶ τὰ κακὰ ἀλλήλων ἀφανίζει, τῇ μαλακότητι <καὶ τῇ εὐοσμίᾳ> θατέρου.*

ἀπὸ τοῦ καρποῦ τῆς χειρὸς ἥδιστα φαίνεται, διο καὶ οἱ μυροπῶλαι τοῦτο μυρίζουσι τὸ μέρος. τὴν δ' αἰτίαν ἐκ τοῦ ἐναντίου ληπτέον, ὅτι τὸ θερμὸν ἐξίστησι καὶ ἀλλοιοῖ· ταχεῖα δ' ἤδη ἡ αἴσθησις τοῖς μύροις ἀναμιγνυμένοις τῷ χρωτί.

54 Ἀπορεῖται δὲ δίοτι οἱ μὴ εἰωθότες μυρίζεσθαι μᾶλλον ἐξόζουσι τῶν συνεχῶς μυριζομένων· εἴη μὲν γὰρ ἂν λέγειν καὶ ὅτι φαντασίαι καὶ οὐκ ἀλήθειαι διὰ τὸ μὴ εἰωθός· εἰ δ' οὖν καὶ ἀληθές, ἔοικε τὸ μὲν οἷον συναναμίγνυσθαι πλείοσιν ὀσμαῖς ἑτέραις ὑφ' ὧν ἀμαυροῦται, συγκαταμιγνυμένου καὶ τοῦ χρωτός, τὸ δὲ ὥσπερ ἀκέραιον δέχεσθαι τὸ μανὸν καὶ ἐκφαίνειν τῇ αἰσθήσει χρονιζόμενον. εἴη δ' ἂν καὶ ἐναντίως λαβεῖν ὡς ἧττον δεχομένου διὰ τὸ ἀσύνηθες, βραδύτερον δ' ἀναμιγνύμενα πλείω χρόνον ἐξόζειν. καὶ τοῦτο μὲν ἔλαττον καὶ οὐ φανερῶς ὁμολογούμενον.

55 Ἅπτεται δὲ μάλιστα τοῦ χρωτὸς καὶ κεφαλῆς καὶ τῶν ἄλλων καὶ πλεῖστον χρόνον ἐμμένει τὰ

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[1] Sc. a part of the body which, not being fleshy, does not spoil the scent by its warmth. So Plin. 13. 19. appears to give the point—*experimentum* (*unguentorum*) *inversa manu capitur, ne carnosae partis calor vitiet*, though it may be questioned whether *inversa manu* represents καρποῦ. Pliny's

be sweetest when the scent comes from the wrist[1]; so that perfumers[2] apply the scent to this part. The explanation must be sought by observing what happens in the contrary case, inasmuch as heat changes or destroys the character of a scent, and the effect on the sense of smell is immediately perceived when perfumes are brought into close contact with the skin.

The question is also raised why those who do not habitually use perfumes smell of them more strongly, when they do so, than those who use them habitually. The suggestion might be made that this is an illusion due to the fact that the use is not habitual, and does not represent what really happens. If however it does, it would appear that in the one case the perfume becomes, as it were, confused with a number of other scents which weaken its force (the smell of the skin also becoming mixed with it), while in the other case the porous condition of the skin takes in the scent as it were uncontaminated, and so makes it perceptible by the sense of smell, because it lingers for some time. One might also make a suggestion of opposite character, that the skin takes in perfumes less readily because it is not used to them, and so, as the perfumes mingle with it more slowly, they preserve[3] their scent for a longer time. One may add that this is a small point and that all do not agree as to the fact.

Those perfumes whose scent is strongest get the best hold on the skin head and other parts of the body, and last for the longest time: such are

phrase presumably means the back of the hand, and suggests that ἀπὸ τοῦ καρποῦ may be corrupt.

[2] Sc. in offering samples for choice.

[3] Sc. it is not absorbed by the skin.

ἰσχυρότατα ταῖς ὀσμαῖς, οἷον μεγαλεῖον, Αἰγύπτιον, ἀμαράκινον· τὰ δ' ἀσθενῆ καὶ <οὐ> πολύοδμα, κούφην ἔχοντα τὴν ἀναπνοήν, ταχεῖαν ποιεῖ καὶ τὴν ἀπόλειψιν, ὥσπερ τό τε ῥόδινον καὶ ἡ κύπρος.

56 Ἔνια δὲ καὶ εἰς τὴν ὑστεραίαν οὐ χεῖρον ὄζει, διαπεπνευκυίας εἴ τις ἐνῆν βαρύτης. τὰ δὲ καὶ ὅλως ἔμμονα μᾶλλον, ὥσπερ ἡ νάρδος καὶ τὸ ἴρινον, πάντων δὲ μάλιστα <τὰ> ἰσχυρότατα. καὶ τὰ μὲν ἔν τε τοῖς λουτροῖς καὶ τῇ ἀνέσει διατηρεῖ πως τὴν ὀσμὴν ἢ οὐ συγκακύνει· τὰ δὲ κακυνόμενα πλείω ποιεῖ δυσωδίαν αὐτῶν τῶν ἱδρώτων, ὡς ἂν σήψεώς τινος ἢ διαφθορᾶς γινομένης.

Καὶ τὰ μὲν περὶ τῆς τῶν μύρων ποιήσεώς τε καὶ δυνάμεως ἐπὶ τοσοῦτον εἰρήσθω.

57 XII. Τὰ δὲ περὶ τὴν τῶν ξηρῶν μίξιν, ἐξ ὧν <τὰ> διαπάσματα καὶ αἱ συνθέσεις, οὐκ ἔτι ζητεῖ μίξιν τῶνδέ τινων ὡρισμένων, ἀλλ' ὅσῳ ἄν τις πλείω καὶ ποικιλώτερα μίξῃ, τοσούτῳ καὶ ἡ ὀσμὴ λαμπροτέρα καὶ ἡδίων, ὥσπερ καὶ ἐξ αὐτῶν τῶν ἀρωμάτων τῶν προχείρων· εἰς ταὐτὸ γὰρ μιγνύντες ἅπαντα χρῶνται. ζητοῦσι δ' ἐν τούτοις καὶ σπεύδουσιν ὥστε μὴ ἑνὸς ἀλλὰ πάντων

[1] τὰ ins. Sch.

megaleion, Egyptian perfume and sweet marjoram-perfume. Those on the other hand which are weak and have not a powerful scent, since they are volatile and evaporate, also quickly come to an end: for instance rose-perfume and *kypros*.

There are some however whose scent is even better on the second day, when any heavy quality that they possessed has evaporated. Some again are altogether more permanent, as spikenard and iris-perfume, and the stronger[1] a perfume is, the longer it lasts. Again some perfumes for some reason keep their scent in the bath when the body is relaxed, or at least do not help to produce a disagreeable effect; while others become disagreeable and cause an even more unpleasant odour than the sweat, as though some sort of decomposition or decay took place.

Let this suffice for an account of the manufacture and properties of perfumes.

Of the making of perfume-powders and compound perfumes.

XII. As to the mixing of solid substances to make powders[1] and compound perfumes, we do not find it here necessary to mix certain specified ingredients: the more numerous and the more various the perfumes that are mixed, the more distinguished and the more grateful will be the scent—just as though one were mixing whatever spices themselves[2] were procurable. As a matter of fact the custom is to use a mixture made of all kinds. Again in perfumes of this class the aim and object is not to make the mixture smell of some one particular thing, but to

[2] Sc. the natural products from which the manufactured perfumes are made.

κοινήν τινα τὴν ὀσμὴν εἶναι. διὸ καὶ ἀνοίγοντες διά τινων ἡμερῶν τὸ ἐξόζον ἐξαιροῦσιν ἀεὶ καὶ τῶν ἰσχυρῶν ἐλάττω μιγνύουσιν, ὥσπερ . . . τὰ δ' ὅλως οὐ μιγνύουσιν, ὥσπερ τὸ ἐρυσίσκηπτρον, ὑπὲρ οὗ καὶ ἀρτίως ἐλέχθη.

58 Βρέχουσι δὲ συντιθέντες τῷ οἴνῳ τῷ εὐώδει· ἔοικε δ' οὖν χρήσιμος εἶναι πρὸς τὰς εὐοσμίας, εἴ γε καὶ οἱ μυρεψοὶ χρῶνται. μένουσι δὲ πολὺν χρόνον αἱ συνθέσεις. ἡ δὲ χρῆσις τούτων μὲν εἰς τὴν τῶν ἱματίων ὀσμήν, τῶν δὲ διαπασμάτων εἰς τὴν στρωμνήν, ὅπως πρὸς τὸν χρῶτα προσπίπτῃ· καὶ γὰρ ἅπτεται μᾶλλον καὶ ἐμμονώτερον τοῦτο, καὶ ὥσπερ ἀντ' ἐκείνου τοῦτο ποιοῦσιν. οἱ δὲ πρότερον ἐνέβαλον οἴνῳ καταβρέχοντες εὐώδει πρὸς τὸ παραιρεῖσθαι τὴν ὀσμήν, ἔνια δὲ καὶ μελικράτῳ καὶ οἴνῳ μιγνύντες ἀνέδευον, τὰ δὲ καὶ αὐτῷ τῷ μελικράτῳ. τὸ γὰρ ὅλον ἄμφω ταῦτα συνεργεῖ πρὸς εὐοσμίαν. διαμένουσι δὲ αἱ συνθέσεις. φανερὸν δ' ἐκ τούτων ὅπερ καὶ πρότερον ἐλέχθη, διότι τὰ ξηρὰ καὶ εὐοσμότερα πρὸς ἄλληλα <μιχθέντα> ταῖς ὀσμαῖς.

59 (61) Εὐλόγως δὲ τὰ μύρα φαρμακώδη διὰ τὴν τῶν ἀρωμάτων δυναμιν· καὶ γὰρ τὰ ἀρώματα τοιαῦτα. δηλοῖ δὲ τά τε καταπλάσματα καὶ ἃ δή τινες

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[1] The example is missing. Turn. supplies *costum et amomum* from Plin. 13. 16, which does not however certainly refer to this passage; see 69, where this passage seems to be repeated.

[2] The reference of ἐκείνου is obscure.

[3] μιχθέντα add. Turn.

produce a general scent derived from them all. This is why every few days they open the vessel and remove each time that perfume whose scent is overpowering the others, adding at the same time smaller quantities of the less powerful scents, such as . . .,[1] while some perfumes are never added, such as galingale, of which we spoke just now.

When they make compound perfumes, they moisten the spices with fragrant wine: and this certainly seems to be useful for producing fragrance, seeing that perfumers also use it. These compound perfumes last a long time. They are used to impart a pleasant odour to clothes, while the powders are used for bedding, so that they may come in contact with the skin: for this kind of preparation gets a better hold and is more lasting, so that men use it thus instead of scenting their bodies directly.[2] Some, before putting the powder in the bedding, soak it in fragrant wine, so that it may acquire its scent: and some powders they moisten by mixing them with mead and wine, or again simply with mead. For in general both these things help to give them fragrance. Compound perfumes also last well. From which what was said above becomes manifest, inasmuch as solid perfumes, when mixed[3] with one another, acquire a greater fragrance.

[4] It is to be expected that perfumes should have medicinal properties in view of the virtues of spices: for these too have such virtues. The effects of

[4] In W.'s text, which I have followed, there is some rearrangement (after Furlanus) of the order of sentences in this chapter and the next: *e.g.* part of § 61 is transferred to § 59. Both figures are retained for convenience of reference.

μαλάγματα καλοῦσιν οἵας ἀποδείκνυται δυνάμεις τά τε φύματα καὶ τὰ ἀποστήματα διαχέοντα καὶ ἄλλα πλείω τῶν κατὰ τὸ σῶμα διαλλοιοῦντα, ἐπιπολῆς μὲν ἀλλὰ καὶ τὰ ἐν βάθει, οἷον, ἄν τις καταπλάσῃ τὰ ὑποχόνδρια καὶ τὸ στῆθος, εὐθὺς σὺν τοῖς ἐρυγμοῖς ἀποδίδωσιν εὐώδεις τὰς ὀσμάς. . . .

61 (59) XIII. Αἱ δὲ τῶν ζώων ὀσμαὶ κατὰ τὰς ἰδίας γίνονται φύσεις· ἑκάστῳ γάρ ἐστί τις οἰκεία κατὰ τὴν κρᾶσιν. αὗται δ' ἡδεῖαι μὲν καὶ καθαραὶ [καὶ] κατὰ τὰς ἀκμὰς καὶ ὅταν εὖ ἔχωσιν ἑαυτῶν, ἔτι δὲ ἡδίους ἁπαλῶν καὶ νέων ὄντων. πλεῖσταί δὲ καὶ κακωδέσταται περὶ τὰς ὀχείας καὶ ὅλως συντηκομένων καὶ καμνόντων σωμάτων· διὸ καὶ οἱ τράγοι καὶ οἱ ἔλαφοι καὶ λαγοὶ καὶ τἆλλα τότε μάλιστα ὄζει.

62 (60) Θαυμαστὸν δὲ καὶ ἴδιον τὸ συμπάσχειν τὰς τραγέας, ὅταν ἡ ὥρα καθήκῃ τῆς ὁρμῆς. αἴτιον δὲ δηλονότι τὸ ὑπολείπεσθαί τινα ἐν τῷ δέρματι δύναμιν ἢ ὑγρότητα τοιαύτην ἀφ' ἧς ἡ ὁρμὴ γίνεται καὶ ζώντων· κινουμένης οὖν καὶ διαθερμαινομένης ταύτης ὑπὸ τοῦ ἀέρος εὔλογον καὶ τὰ δέρματα καθ' ὅσον ἐπιβάλλει. διὸ καὶ ὡς

[1] § 60 on some other medicinal effects of perfumes is omitted. [2] καὶ bracketed by W.

plasters and of what some call 'poultices' prove what virtues they display, since they disperse tumours and abscesses and produce a distinct effect on various other parts of the body, on its surface, but also on the interior parts: for instance, if one lays a plaster on his abdomen and breast, the patient forthwith produces fragrant odours along with his eructations.[1]

Of the characteristic smells of animals, and of certain curious facts as to the smell of animal and vegetable products.

XIII. The smells of animals correspond to their several characters: each has a smell of its own according to its particular composition. These smells are pleasant and pure when[2] the animal is in its prime and in good condition, and even pleasanter when they[3] are young and tender. But the smell is strongest and least pleasant at the breeding season, and generally when the body is wasting or out of condition: wherefore goats stags hares and other animals have most smell at such times.

It is a remarkable fact and peculiar to the goat that goat-skins[4] are sympathetically affected when the breeding season comes round. The reason plainly is that there remains somehow in the hide the sort of virtue or moisture from which arises the breeding impulse when the animal is alive. It is natural therefore that, when this is excited and warmed by the air, the skin also should be excited[5] so far as it belongs to it to be so affected. Wherefore the original cause as it were of the

[3] ἑαυτὸν can hardly be sound: ? αὐτὰ (sc. τὰ ζῷα).
[4] *i.e.* the skin of a dead goat.
[5] W. adds κινεῖσθαι after ἐπιβάλλει.

πρῶτον αἴτιον ἡ διάθεσις· τότε γὰρ καὶ οἱ μὴ ὀχεύοντες ὄζουσι καὶ οἱ ἄγονοι καὶ αἱ αἶγες ὅλως. ἡ δ' ὀχεία τότε μὲν μεγάλην μερίδα συμβάλλεται, καθ' αὑτὴν δ' αἰτία γίνεται ἡ διάθεσις.

63 Συμβαίνει δὲ τρόπον τινὰ καὶ ἐν ἄλλοις ἡ τοιαύτη συμπάθεια· καὶ γὰρ ὁ οἶνος ἅμα τῇ σταφυλῇ δοκεῖ συνανθεῖν καὶ τὰ σκόροδα καὶ τὰ κρόμυα τότε δριμύτατον ὄζειν, ὅταν <τὰ> ἐν τῇ γῇ βλαστάνῃ· πλὴν τούτοις ἅμα συμβαίνει καὶ αὐτοῖς βλαστάνειν. ὅλως δὲ πάντα κινεῖται τὰ φλοιόριζα καὶ σαρκόριζα μὴ ἀπεξηραμμένα κατὰ τὰς βλαστητικὰς ὥρας· ἡ γὰρ ἐνυπάρχουσα δύναμις ἐν αὐτοῖς κινεῖται. θαυμασιώτατον δὲ τῶν τοιούτων τὸ ἐπὶ τοῦ στέατος τῆς ἄρκτου συμβαῖνον, εἴπερ ἅμα ταῖς φωλίαις ἐπαίρεται καὶ ἐκπληροῖ τὰ ἀγγεῖα.

64 XIV. Τί δή ποτε Δημόκριτος τοὺς μὲν χυμοὺς πρὸς τὴν γεῦσιν ἀποδίδωσι, τὰς δ' ὀσμὰς καὶ τὰς χρόας οὐχ ὁμοίως πρὸς τὰς ὑποκειμένας αἰσθήσεις; ἔδει γὰρ ἐκ τῶν σχημάτων. ἢ τοῦτό γε πρὸς ἅπαντας κοινόν; ἅπαντες γὰρ οἱ μὲν μόνης

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[1] *i.e.* to form a 'crust.' [2] τὰ ins. Sch.
[3] *cf. H.P.* 1. 6. 7.
[4] *i.e.* when the fat of the living bear becomes abnormally developed. Plin. 8. 128. expresses his surprise at T.'s credulity

phenomenon is the special condition of the animal at such periods: for at these times even those males which are not breeding have the smell, and the sterile goats and the females in general. Indeed, though at that particular time the fact that animals are actually breeding is a powerful factor in producing the smell, yet their condition is in itself a cause.

Similar sympathetic behaviour is found in a manner in other things also. Thus wine appears to 'bloom'[1] at the same time as the growing grape, and stored garlic and onions appear to have the most pungent smell at the season when those[2] in the ground are sprouting: however in this case sprouting takes place in the stored vegetables also. And in general any plant whose root is in layers[3] or fleshy becomes active at the season of sprouting, unless it has been completely dried: for it is the force latent in such plants which is stirred into activity. But the most remarkable phenomenon of the kind is what occurs with bears' grease: it makes active growth at the time of the bear's winter sleep[4] and completely fills the vessels in which it is kept.

Of odours as compared with other sense-impressions.

XIV. What can be the reason why Democritus, though he assigns various flavours to the sense of taste, yet does not in like manner assign various smells and colours to the senses to which they belong? According to his system he should have done so. Perhaps the same criticism should apply to all who have dealt with the subject: for they all

in this matter: his version (*coctas ursorum carnes*) adds to the marvel.

οἱ δὲ μάλιστα ταύτης τὰ πάθη λέγουσι καὶ τὰς διαφοράς, ὡς ἐν χρώμασι λευκὸν καὶ μέλαν, καὶ ἐν χυμοῖς γλυκὺ καὶ πικρόν, οὐχ οὕτω δ' ἐν ὀσμαῖς· οὐδὲν γὰρ πλὴν τό τ' εὔοσμον καὶ τὸ κάκοσμον. οὐδ' ἐν ἁπτοῖς· πλείω γὰρ εὐθὺ τὰ ὑποκειμενα, σκληρὸν μαλακὸν τραχὺ λεῖον.

65 Ἀλλὰ μᾶλλον ἐν φωναῖς, ὀξὺ καὶ βαρύ. ἔτι δὲ τὰ μὲν μικτὰ τὰ δ' ἄμικτα. ἄμικτοι χυλοὶ οἱ μὲν τῷ μὴ καταμερίζεσθαι ὥστ' ἐξ ἀμφοῖν, οἷον ὕδωρ ἔλαιον φλέγμα αἷμα, ὅλως πᾶν τὸ ἐπινέον ἢ τὸ διαιροῦν, ὥσπερ τὸ ὄξος καὶ τὸ γάλα. τὸ γὰρ τῇ πιέσει καὶ τρίψει μιγνύμενον ἕτερον εἶδος. ἄλλον δὲ τρόπον οἱ μὴ εὔμικτοι πρὸς τὴν χρείαν ἢ καὶ λυμαινόμενοι ἀλλήλους, οἷον ἡ θάλαττα καὶ τὰ νιτρώδη καὶ πικρὰ ὕδατα τοὺς οἴνους καὶ τὰ πότιμα, ἐὰν μὴ εὐθὺς χρῆταί τις.

66 Ὀσμαὶ δὲ αἱ μὲν οὕτως ἄμικτοι πλείους καὶ ὥστε καθόλου λαβεῖν αἱ κακώδεις ταῖς κακώδεσι. ὡς δὲ βέλτιόν τι τὸ ἐξ ἀμφοῖν ἔργον εὑρεῖν εἰ

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[1] *i.e.* taste.

[2] There seems to be some confusion here, as in the first sentence of the section T. complained that colours are *not* classified. The following passage is unusually elliptical, and the text is probably defective. T.'s complaint seems to be that sense-experiences *in general* have been inadequately classified (*cf.* 2); and in 66 foll. he specially mentions smells.

either give the various qualities and distinguish the experiences of this sense [1] alone or at least comparatively neglect the others: thus with colours [2] they distinguish white and black, and with flavours sweet and bitter, yet they make no corresponding classification of smells, but merely class them as 'pleasant' or 'unpleasant.' So too they fail to distinguish different experiences of the sense of touch, whereas several belong immediately to this sense, as hardness, softness, roughness, smoothness.

In sounds still more are there differences, as that between shrill and deep. Again some sense-experiences are simple, some compound. Flavours are simple first in the sense that they cannot be resolved into two components [3]: instances are water oil phlegm blood,[4] and in general anything which floats, like milk,[5] or which causes separation, like vinegar. (Where mixture can be produced by pressure or crushing, it is quite a different matter). Secondly there are flavours which do not readily combine in another sense, namely for human use, or which even spoil one another if they are mixed, as sea-water, or water with soda in it or which has a bitter taste: these spoil wines or other things that are good to drink, unless they are taken at once.

Now the odours which in this sense do not combine are numerous, and, speaking generally, it is the pleasant odours which do not combine with the unpleasant ones. It would indeed be difficult, if not impossible, to find a case in which mixture is an

[3] Sch. and W. after Turn. add <ἓν γίνεσθαι> after ἀμφοῖν, which seems unnecessary.

[4] *i.e.* a liquid which, in one way or another, refuses to mix with another liquid. [5] ? cream.

μὴ ἀδύνατον, εἰς τὴν τοιαύτην δὲ δύναμιν <οὐχ>[1] ἅπαν ὡς εἰπεῖν πρὸς πᾶν εὔοσμον. ἀλλ' ἔνθα μὲν ἴσως χείρω ποιεῖ ἔνθα δὲ βελτίω, καθάπερ ἐπὶ τῶν μύρων· τὰ μὲν γὰρ ἀφαιρεῖται τὸ ἄκρατον καὶ σκληρόν, τὰ δ' ἀποθηλύνει καὶ ὥσπερ ἐξυδατοῖ τὰς ὀσμάς. ἐν δὲ τοῖς ξηροῖς ἅπασαι πάσαις μικταί.

67 Τὰ γὰρ διαπάσματα ὅσῳ ἂν ᾖ πλειόνων ἀμείνω. ποιεῖ δὲ καὶ ἡ τοῦ οἴνου κατάμιξις καὶ μύρα ἔνια καὶ θυμιάματα εὐοσμότερα, καθάπερ τὴν σμύρναν. δοκεῖ δὲ καὶ τὸ μύρον ἡδύνειν τοὺς οἴνους, διὸ καὶ οἱ μὲν ἐν τῇ οἰνοποιίᾳ μιγνύουσιν οἱ δὲ οὕτως ἐπιχεόμενον πίνουσιν. οὐκ ἄλογον δὲ συνέγγυς τὰς αἰσθήσεις οὔσας καὶ ἐν τοῖς αὐτοῖς ὑποκειμένοις ἔχειν τινὰ ἐπικοινωνίαν· ὡς γὰρ ἐπὶ τὸ πᾶν οὐδεὶς οὔτε χυλὸς ἄοσμος οὔτε ὀσμὴ ἄχυλος· τοῦτο δὲ ὅτι οὐδεμία ἐκ μὴ ἔχοντος χυλόν.

68 Συμβαίνει δὲ καὶ μεταβάλλειν τὰς ὀσμὰς ἅμα τοῖς χυλοῖς, ὥσπερ ἐπί τε τοῦ οἴνου καὶ ἐπὶ καρπῶν τινῶν· ἐνίων δὲ καὶ ἐν τῷ ἄνθει πρότερον, ὥσπερ τῶν βοτρύων· ἡ δὲ τῶν μύρων εἰς ἀκμὴν μόνον καὶ οἷον φθίσιν. μετακινοῦνται δ' ἐν ταῖς ἐτείαις ὥραις πάνθ' ὡς εἰπεῖν, μάλιστα δὲ τὰ

[1] I have inserted οὐχ, suggested by Sch.

[2] Like Sch. I fail to see the relevance of this remark. The sense required is 'while the fruit is still on the tree':

improvement to the odour: in fact one might say that not[1] every combination of one fragrant thing with another will produce such a quality, but though sometimes the effect of such mixture is an improvement, sometimes it may be the reverse, as in the case of perfumes: for while the effect of some admixtures is to remove excessive strength or harshness, in other cases the odour is enfeebled and made, as it were, insipid. With solids however all combinations are possible.

In fact powders are the better, the more ingredients they have. Also the admixture of wine makes some perfumes and things used for incense more fragrant, for instance myrrh. It appears also that perfume sweetens wines, wherefore some add it in the manufacture, some put it in at the time of drinking. Nor is it unnatural that between these senses, since they are akin and are affected by the same objects, there should be a sort of reciprocity: for, to speak generally, no taste is unaccompanied by smell and no smell is unaccompanied by taste, the reason being that a thing which has no taste produces no smell.

It is also the case that smells actually change along with tastes, for instance in wine and certain fruits. And in some cases, as with grapes, the change takes place earlier, during[2] the flowering period: while in perfumes it occurs only when they have reached their best and are about, as it were, to go off. Almost all perfumes undergo alteration at certain seasons of the year, and this applies specially to the weakest kinds: in the case of those made

possibly ἀνθεῖ has got in from below and we should read καρπῷ.

ἀσθενέστατα, τὰ δ' ἄνθινα καθ' ἣν ὥραν ἀνθεῖ τὸ ἄνθος.

69 [Τὰς συνθέσεις ποιοῦσιν ἐκ τῶν ἀρωμάτων· θραύσαντες πολλὰ καὶ μίξαντες εἰς ταὐτὸ κλείουσιν εἰς κιβώτιον, εἶτ' ἀνοίγοντες διά τινων ἡμερῶν ὅτι ἂν μάλιστα ὄζειν δοκῇ τοῦτ' αἴρουσι, καὶ πάλιν δὲ καὶ πάλιν διαλείποντες χρόνον, ὅπως ἂν μηδενὸς ἐξόζῃ. θαυμαστὴν δ' ὀσμὴν λαμβάνει τὰ ἱμάτια εἰς ταῦτα τιθέμενα.

Τὸ δὲ τῆς βαλάνου τῆς Αἰγυπτίας μύρον αὐτὸ μὲν οὐκ ἄγαν ἀναπνεῖ, μιγνύμενον δὲ ποιεῖ τἆλλα βελτίω μάλιστα δὲ τὴν ἶριν]. . . .

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[1] *cf.* 63.
[2] *cf.* 57, of which this section seems to be a repetition.
[3] *cf.* 15.

from flowers this period is that at which the plants from which they are made are in bloom.[1]

[Compound[2] perfumes are made from spices: they bruise and mix a variety of these and shut them up together in a box. Then after a few days they open the box and take out the spice which seems to have the strongest smell: this treatment is repeated at intervals, so that the smell of no one ingredient may overpower the others. And clothes put away with such perfumes acquire a marvellous fragrance.

The perfume[3] made of the Egyptian *balanos*, though it has not much scent of its own, when mixed with others, especially iris-perfume, improves them]. . . .[4]

[4] The remaining sentences (§§ 70, 71) seem to be disconnected scraps, which perhaps do not belong to this treatise at all. The text of them being defective, it seems not worth while to attempt translation.

ΠΕΡΙ ΣΗΜΕΙΩΝ ΥΔΑΤΩΝ ΚΑΙ ΠΝΕΥΜΑΤΩΝ ΚΑΙ ΧΕΙΜΩΝΩΝ ΚΑΙ ΕΤΔΙΩΝ

Ι. Σημεῖα ὑδάτων καὶ πνευμάτων καὶ χειμώνων καὶ εὐδιῶν ὧδε ἐγράψαμεν καθ' ὅσον ἦν ἐφικτόν, ἃ μὲν αὐτοὶ προσκοπήσαντες ἃ δὲ παρ' ἑτέρων οὐκ ἀδοκίμων λαβόντες.

Τὰ μὲν οὖν ἐπὶ τοῖς ἄστροις δυομένοις καὶ ἀνατέλλουσιν ἐκ τῶν ἀστρονομικῶν δεῖ λαμβά-
2 νειν. εἰσὶ δὲ δύσεις διτταί· οἵ τε γὰρ ἀφανισμοὶ δύσεις εἰσί· τοῦτο δέ ἐστιν ὅταν ἅμα συνδύνῃ τῷ ἡλίῳ τὸ ἄστρον, καὶ ὅταν ἀνατέλλοντος δύνῃ. ὁμοίως δὲ καὶ ἀνατολαὶ διτταί, αἱ μὲν ἑῷοι ὅταν προανατέλλῃ τοῦ ἡλίου τὸ ἄστρον, αἱ δ' ἀκρόνυχοι ὅταν ἅμα δυομένῳ ἀνατέλλῃ.

Αἱ μὲν οὖν τοῦ Ἀρκτούρου λεγόμεναι ἀνατολαὶ ἀμφοτέρως συμβαίνουσιν· ἡ μὲν γὰρ τοῦ χειμῶνος ἀκρόνυχός ἐστιν, ἡ δὲ μετωπορινὴ ἑῴα. τῶν δ' ἄλλων αἱ πλεῖσται τῶν ὀνομαζομένων ἑῷαι, οἷον Πλειάδος καὶ Ὠρίωνος καὶ Κυνός.

3 Τῶν δὲ λοιπῶν σημείων ἔνια μὲν ἴδια κατὰ πάσας χώρας ἐστὶν ἐν ὅσαις ὄρη ὑψηλὰ καὶ αὐλῶνές εἰσι, μάλιστα δὲ ὅσα πρὸς θάλασσαν καθήκει τῶν ὑψηλῶν· τῶν τὲ γὰρ πνευμάτων ἀρχομένων τὰ νέφη προσπίπτει πρὸς τοὺς τοιούτους τόπους, καὶ μεθισταμένων εἰς τοὐναντίον

CONCERNING WEATHER SIGNS

Introductory: general principles.

I. The signs of rain wind storm and fair weather we have described so far as was attainable, partly from our own observation, partly from the information of persons of credit.

Now those signs which belong to the setting or rising of the heavenly bodies must be learnt from astronomy.[1] Their settings are twofold, since they may be said to have set when they become invisible. And this occurs when the star sets along with the sun, and also when it sets at sunrise. In like manner their risings are twofold: there is the morning rising, when the star rises before the sun, and there is the rising at nightfall, when it rises at sunset.

Now what are called the risings of Arcturus occur at both times, his winter rising being at nightfall and his autumn rising at dawn. But the rising of most of the familiar constellations is at dawn, for instance, the Pleiad Orion and the Dog.

Of the remaining signs some belong specially to all such lands as contain high mountains and valleys, specially where such mountains extend down to the sea: for, when the winds begin to blow, the clouds are thrown against such places, and, when the winds

[1] Or, perhaps, 'from my astronomical works.'

ἀντιμεθίστανται καὶ ὑγρότερα γινόμενα διὰ βάρος εἰς τὰ κοῖλα συγκαθίζει. διὸ δεῖ προσέχειν οὗ ἄν τις ἱδρυμένος ᾖ. ἔστι γὰρ ἀεί τινα λαβεῖν τοιοῦτον γνώμονα καὶ ἔστι σαφέστατα σημεῖα τὰ ἀπὸ τούτων.

4 Διὸ καὶ ἀγαθοὶ γεγένηνται κατὰ τόπους τινὰς ἀστρονόμοι ἔνιοι, οἷον Ματρικέτας[2] ἐν Μηθύμνῃ ἀπὸ τοῦ Λεπετύμνου, καὶ Κλεόστρατος[3] ἐν Τενέδῳ ἀπὸ τῆς Ἴδης, καὶ Φαεινὸς Ἀθήνῃσιν ἀπὸ τοῦ Λυκαβηττοῦ τὰ περὶ τὰς τροπὰς συνεῖδε, παρ' οὗ Μέτων ἀκούσας τὸν τοῦ ἐνὸς δέοντα εἴκοσιν ἐνιαυτῶν <κύκλον> συνέταξεν. ἦν δὲ ὁ μὲν Φαεινὸς μέτοικος Ἀθήνῃσιν ὁ δὲ Μέτων Ἀθηναῖος. καὶ ἄλλοι δὲ τὸν τρόπον τοῦτον ἠστρολόγησαν.

5 Ἄλλα δέ ἐστι σημεῖα ἃ λαμβάνεται ἀπό τε ζώων τῶν κατ' οἰκίαν καὶ ἑτέρων τινῶν τόπων καὶ παθημάτων, μάλιστα δὲ κυριώτατα <τὰ> ἀπὸ τοῦ ἡλίου καὶ τῆς σελήνης· ἡ γὰρ σελήνη νυκτὸς οἷον ἥλιός ἐστι· διὸ καὶ αἱ σύνοδοι τῶν μηνῶν χειμέριοί εἰσιν, ὅτι ἀπολείπει τὸ φῶς τῆς σελήνης ἀπὸ τετράδος φθίνοντος μέχρι τετράδος ἱσταμένου. ὥσπερ οὖν ἡλίου ἀπόλειψις γίνεται κατὰ τὸν ὅμοιον τρόπον καὶ τῆς σελήνης ἔκλειψις.

6 δεῖ οὖν προσέχειν μάλιστα ταῖς ἀνατολαῖς ταῖς τούτων καὶ ταῖς δύσεσιν ὁποίας ἂν ποιῶνται τὸν βουλόμενον προγινώσκειν.

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[1] ἀντιμεθίστανται. ? ἀντιμεθίσταται.

[2] Plin. 5. 140. Of Matriketas nothing is known.

[3] Said (Plin. 2. 31) to have first recognised the Ram and the Archer. Athen. (7. 278 *b*) connects him with Tenedos,

change, the clouds also change [1] and take a contrary direction, and, as they become laden with moisture, they settle down in the hollows because of their weight. Wherefore good heed must be taken to the local conditions of the region in which one is placed. It is indeed always possible to find such an observer, and the signs learnt from such persons are the most trustworthy.

Thus in some parts have been found good astronomers: for instance, [2] Matriketas at Methymna observed the solstices from Mount Lepetymnos, Cleostratus [3] in Tenedos from Mount Ida, Phaeinos at Athens from Mount Lycabettus: Meton, who made the cycle [4] of nineteen years, was the pupil of the last-named. Phaeinos was a resident alien at Athens, while Meton was an Athenian. Others also have made astronomical observations in like manner.

Again there are other signs which are taken from domestic animals or from certain other quarters and happenings. Most important of all are the [5] signs taken from the sun and moon: for the moon is as it were a nocturnal sun. Wherefore also the meetings of the months are stormy, because the moon's light fails from the fourth day from the end of one month to the fourth day from the beginning of the next: there is therefore a failure of the moon corresponding to the failure of the sun. Wherefore anyone who desires to forecast the weather must pay especial heed to the character of the risings and settings of these luminaries.

[4] Called 'the great year': *cf.* Aelian. *V.H.* 10. 7. *τὸν τοῦ ἐνὸς δέοντα εἴκοσιν ἐνιαυτῶν <κύκλον>* conj. Sch. *ἐνιαυτὸν* conj. W.

[5] *τὰ* seems necessary. ? *κύρια τὰ*.

Πρῶτον μὲν οὖν ληπτέον ὅτι αἱ διχοτομίαι διορίζουσι τὰς ὥρας, ὥστε ἐπὶ τούτων δεῖ ἀθρεῖν καὶ ἐνιαυτὸν καὶ μῆνα καὶ ἡμέραν. διχοτομεῖ δὲ τὸν μὲν ἐνιαυτὸν Πλειάς τε δυομένη καὶ ἀνατέλλουσα· ἀπὸ γὰρ δύσεως μέχρι ἀνατολῆς τὸ ἥμισυ τοῦ ἐνιαυτοῦ ἐστίν. ὥστε δίχα τέμνεται ὁ
7 πᾶς χρόνος. ὁμοίως δὲ καὶ αἱ τροπαὶ καὶ ἰσημερίαι ποιοῦσιν. οἵα τις ἂν οὖν ᾖ κατάστασις τοῦ ἀέρος Πλειάδος δυομένης, οὕτω ἔχει ὡς ἐπὶ τὸ πολὺ μέχρι τροπῶν, κἂν μεταβάλλῃ, μετὰ τροπάς· ἐὰν δὲ μὴ μεταβάλλῃ, διέχει ἕως ἰσημερίας, κἀκεῖθεν ὡσαύτως μέχρι Πλειάδος, καὶ ἀπὸ ταύτης μέχρι τροπῶν θερινῶν, καὶ ἐντεῦθεν μέχρι ἰσημερίας, καὶ ἀπὸ ἰσημερίας μέχρι Πλειάδος δύσεως.

8 Ὡς δ' αὕτως ἔχει καὶ περὶ τὸν μῆνα ἕκαστον· διχοτομοῦσι γὰρ αἵ τε πανσέληνοι καὶ αἱ ὀγδόαι καὶ αἱ τετράδες, ὥστε ἀπὸ νουμηνίας ὡς ἀπ' ἀρχῆς δεῖ σκοπεῖν. μεταβάλλει γὰρ ὡς ἐπὶ τὸ πολὺ ἐν τῇ τετράδι, ἐὰν δὲ μή, ἐν τῇ ὀγδόῃ, εἰ δὲ μή, πανσελήνῳ· ἀπὸ δὲ πανσελήνου εἰς ὀγδόην φθίνοντος, καὶ ἀπὸ ταύτης εἰς τετράδα, ἀπὸ δὲ τετράδος εἰς τὴν νουμηνίαν.

9 Ὡς δ' αὕτως καὶ ἐπὶ τῆς ἡμέρας ἔχουσιν αἱ μεταβολαὶ ὡς ἐπὶ τὸ πολύ. ἀνατολὴ γὰρ καὶ πρωὶ καὶ μεσημβρία καὶ δείλη καὶ δύσις, καὶ τὰ τῆς νυκτὸς μέρη τὰ ἀνάλογα ταὐτὸ ποιεῖ τοῖς εἰρημένοις περὶ πνευμάτων καὶ χειμῶνος καὶ εὐδίας. μάλιστα γὰρ ἐὰν μέλλῃ μεταβάλλειν, ἐν

Now the first point to be seized is that the various periods are all divided in half, so that one's study of the year the month or the day should take account of these divisions. The year is divided in half by the setting and rising of the Pleiad [1]: for from the setting to the rising is a half year. So that to begin with the whole period is divided into halves: and a like division is effected by the solstices and equinoxes. From which it follows that, whatever is the condition of the atmosphere when the Pleiad sets, that it continues in general to be till the winter solstice, and, if it does change, the change only takes place after the solstice: while, if it does not change, it continues the same till the spring equinox: the same principle holds good from that time to the rising of the Pleiad, from that again to the summer solstice, from that again to the autumnal equinox, and from that to the setting of the Pleiad.

So too is it with each month; the full moon and the eighth [2] and the fourth days make divisions into halves, so that one should make the new moon the starting-point of one's survey. A change most often takes place on the fourth day, or, failing that, on the eighth, or, failing that, at the full moon; after that the periods are from the full moon to the eighth day from the end of the month, from that to the fourth day from the end, and from that to the new moon.

The divisions of the day follow in general the same principle: there is the sunrise, the mid-morning, noon, mid-afternoon, and sunset; and the corresponding divisions of the night have like effects in the matter of winds storms and fair weather; that is to say, if there is to be a change, it will generally

[1] Plin. 18. 280. [2] *cf.* Arat. 73 f.

ταῖς διχοτομίαις μεταβάλλει. καθόλου μὲν οὖν τὰς ὥρας οὕτω δεῖ παρατηρεῖν, καθ' ἕκαστα δὲ τῶν σημείων κατὰ τὸν ὑπογεγραμμένον τρόπον.

10 Ὕδατος μὲν οὖν σημεῖα τὰ τοιαῦτα δοκεῖ εἶναι. ἐναργέστατον μὲν οὖν τὸ ἑωθινόν, ὅταν πρὸ ἡλίου ἀνατολῆς φαίνηται ἐπιφοινίσσον σημεῖον· ἢ γὰρ αὐθημερινὸν ἐπισημαίνει ἢ τριῶν ἡμερῶν ὡς ἐπὶ τὸ πολύ. δηλοῖ δὲ καὶ τὰ ἄλλα σημεῖα· ἐὰν γὰρ μὴ πρότερον, τριταῖα μάλιστα σημαίνει τὸ ἐπιφοινίσσον καὶ δύνοντος, ἧττον δὲ ἢ τὸ ἑωθινοῦ.

11 Καὶ ἐὰν δύῃ χειμῶνος ἢ ἔαρος εἰς νεφέλιον, τριῶν ἡμερῶν ὡς τὰ πολλὰ ἐπισημαίνει. καὶ ἐὰν ῥάβδοι νοτόθεν, ταὐτὰ δὲ ταῦτα βορρᾶθεν γινόμενα ἀσθενέστερα. καὶ ἐὰν ἀνίσχων μέλαν σημεῖον ἴσχῃ, καὶ ἐὰν ἐκ νεφελῶν <ἀν>έχῃ, ὑδατικόν, καὶ ἐὰν ἀκτῖνες ἀνίσχοντος ἀνατείνωσι πρὶν ἀνατεῖλαι, κοινὸν ὕδατος σημεῖον καὶ ἀνέμου. καὶ ἐὰν καταφερομένου τοῦ ἡλίου ὑφίστηται νέφος, ὑφ' οὗ ἐὰν σχίζωνται αἱ ἀκτῖνες, χειμερινὸν τὸ σημεῖον. καὶ ὅταν καυματίας δύηται καὶ ἀνατέλλῃ, ἐὰν μὴ ἄνεμος γένηται, ὕδατος τὸ σημεῖον.

12 Τὰ αὐτὰ δὲ σημαίνει καὶ σελήνη πανσελήνῳ ἀνίσχουσα, ἀσθενέστερα δὲ ὁ μείς. ἐὰν μὲν ᾖ πυρώδης, πνευματώδη σημαίνει τὸν μῆνα, ἐὰν δὲ ζοφώδης, ὑδατώδη· σημαίνει δὲ ὅτι ἂν σημαίνῃ τριταῖος ὢν ὁ μείς.

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[1] τὸν ὑπογ. τρόπον seems to mean the same as the Aristotelian τὸν ὑφηγημένον τρόπον, *e.g. Eth. Nic.* 2. 7. 9. The rendering 'the following method' would however suit the context.

occur at one of these divisions. In general therefore one should observe the periods in the way indicated, though as to particular signs we must follow the accepted method.[1]

The signs of rain.

Now the signs of rain appear to be as follows: most unmistakable is that which occurs at dawn, when the sky has a reddish appearance before sunrise; for this usually indicates rain within three days, if not on that very day. Other signs point the same way: thus a red sky at sunset indicates rain within three days, if not before, though less certainly than a red sky at dawn.

Again, if the sun sets in a cloud in winter or spring, this generally indicates rain within three days. So too, if there are streaks of light from the south, while, if these are seen in the north, it is a less certain sign. Again, if the sun when it rises has a black mark, or if it rises [2] out of clouds, it is a sign of rain; while, if at sunrise there are rays [3] shooting out before the actual rising, it is a sign of rain and also of wind. Again if, as the sun sinks, a cloud forms below it and this breaks up its rays, it is a sign of stormy weather. Again, if it sets or rises with a burning heat, and there is no wind, it is a sign of rain.

Moonrise gives similar indications, at the time of full moon: they are less certain when the moon is not full. If the moon looks fiery, it indicates breezy weather for that month, if dusky, wet weather; and, whatever indications the crescent moon gives, are given when it is three days old.

[2] ἀνέχῃ conj. Sch. [3] Plin. 18. 344.

13 Ἀστέρες πολλοὶ διάττοντες ὕδατος ἢ πνεύματος, καὶ ὅθεν ἂν διάττωσιν ἐντεῦθεν τὸ πνεῦμα ἢ τὸ ὕδωρ. καὶ ἐὰν ἀκτῖνες ἀθρόαι ἀνίσχωσιν ἀνιόντος ἢ δύνοντος, σημεῖον <ὕδατος>. καὶ ὅταν ἀνίσχοντος τοῦ ἡλίου αἱ αὐγαὶ οἷον ἐκλείποντος χρῶμα ἴσχωσιν, ὕδατος σημεῖον. καὶ ὅταν νεφέλαι πόκοις ἐρίων ὅμοιαι ὦσιν, ὕδωρ σημαίνει. [ὑετοῦ δὲ σημεῖα] πομφόλυγες ἀνιστάμεναι πλείους ἐπὶ τῶν ποταμῶν ὕδωρ σημαίνουσι πολύ. ὡς δ' ἐπὶ τὸ πολὺ ἶρις περὶ λύχνον ἢ διὰ λύχνου διαφαινομένη νότια σημαίνει ὕδατα.

14 Καὶ οἱ μύκητες ἐὰν νότια ᾖ, ὕδωρ σημαίνουσι, σημαίνουσι δὲ καὶ ἄνεμον κατὰ λόγον ὡς ἂν ἔχωσι πλήθους καὶ μεγέθους, σμικροὶ δὲ καὶ κεγχρώδεις καὶ λαμπροὶ ὕδωρ καὶ ἄνεμον. καὶ ὅταν χειμῶνος τὴν φλόγα <ὁ λύχνος> ἀπωθῇ διαλιπὼν οἷον πομφόλυγας, ὕδατος σημεῖον, καὶ ἐὰν πηδῶσιν αἱ ἀκτῖνες ἐπ' αὐτόν, καὶ ἐὰν σπινθῆρες ἐπιγένωνται.

15 Ὄρνιθες λουόμενοι μὴ ἐν ὕδατι βιοῦντες ὕδωρ ἢ χειμῶνας σημαίνουσι. καὶ φρύνη λουομένη καὶ βάτραχοι μᾶλλον ᾄδοντες σημαίνουσιν ὕδωρ. καὶ ἡ σαύρα φαινομένη, ἣν καλοῦσι σαλαμάνδραν, ἔτι δὲ καὶ χλωρὸς βάτραχος ἐπὶ δένδρου ᾄδων ὕδωρ σημαίνει. χελιδόνες τῇ γαστρὶ τύπτουσαι τὰς λίμνας ὕδωρ σημαίνουσι. βοὺς τὴν προσθίαν ὁπλὴν λείξας χειμῶνα ἢ ὕδωρ σημαίνει. ἐὰν

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[1] *cf.* 37. [2] ὕδατος ins. Furl. [3] Plin. 18. 344.
[4] Plin. 18. 356. [5] ὑετοῦ δὲ σημεῖα bracketed by Sch.
[6] *cf.* Arist. *Meteor.* 3. 4; Plut. *Quaest. Nat.* 1. 2.
[7] *cf.* 42.
[8] *i.e.* breaks up into small 'grains' (?). *cf.* 25, 42, 54.

Many shooting [1] stars are a sign of rain or wind, and the wind or rain will come from that quarter from which they appear. Again, if at sunrise or sunset the sun's rays appear massed together, it is a sign of rain.[2] Also it is a sign of rain when at sunrise the rays [3] are coloured as in an eclipse ; and also when there are clouds [4] like a fleece of wool. The rising of bubbles [5] in large numbers on the surface of rivers is a sign of abundant rain. And in general, when a rainbow [6] is seen round or through a lamp, it signifies rain from the south.

Again, if the wind is from the south, the snuff [7] of the lamp-wick indicates rain ; it also indicates wind in proportion to its bulk and size : while if the snuff is small, like millet-seed,[8] and of bright colour, it indicates rain as well as wind. Again, when in winter the lamp rejects [9] the flame but catches, as it were, here and there in spurts, it is a sign of rain : so also is it, if the rays of light leap up on the lamp, or if there are sparks.

It is a sign of rain or storm when birds which are not aquatic take a bath. It is a sign of rain when a toad takes a bath, and still more so when frogs are vocal. So too is the appearance of the lizard known as 'salamander,' [10] and still more the chirruping of the green frog in a tree. It is a sign of rain when swallows [11] hit the water of the lakes with their belly. It is a sign of storm or rain when the ox

[9] *i.e.* refuses to light properly. The appearance seems to be that described Verg. *Georg.* 1. 391 (*scintillare oleum*). In the same passage *putres concrescere fungos* perhaps illustrates the comparison of the snuff to millet-seed above.

[10] *cf. de igne* 60, where it is explained why the salamander puts fire out.

[11] Plin. 18. 363 ; Verg. *Georg.* 1. 377.

δὲ εἰς τὸν οὐρανὸν ἀνακύπτων ὀσφραίνηται, ὕδωρ σημαίνει.

16 Κορώνη ἐπὶ πέτρας κορυσσομένη ἦν κῦμα κατακλύζει ὕδωρ σημαίνει· καὶ κολυμβῶσα πολλάκις καὶ περιπετομένη ὕδωρ σημαίνει. κόραξ πολλὰς μεταβάλλειν εἰωθὼς φωνάς, τούτων ἐὰν ταχὺ δὶς φθέγξηται καὶ ἐπιρροιζήσῃ καὶ τινάξῃ τὰ πτέρα, ὕδωρ σημαίνει. καὶ ἐὰν ὑετῶν ὄντων πολλὰς μεταβάλλῃ φωνὰς καὶ ἐὰν φθειρίζηται ἐπ' ἐλαίας. καὶ ἐάν τε εὐδίας ἐάν τε ὕδατος ὄντος μιμῆται τῇ φωνῇ οἷον σταλαγμούς, ὕδωρ σημαίνει. ἐάν τε κόρακες ἐάν τε κολοιοὶ ἄνω πέτωνται καὶ ἱερακίζωσιν, ὕδωρ σημαίνουσι. καὶ ἐὰν κόραξ εὐδίας μὴ τὴν εἰωθυῖαν φωνὴν ἵῃ καὶ ἐπιρροιβδῇ, ὕδωρ σημαίνει.

17 Ἐὰν ἱέραξ ἐπὶ δένδρου καθεζόμενος καὶ εἴσω εἰσπετόμενος φθειρίζηται, ὕδωρ σημαίνει. καὶ θέρους ὅταν πολλοὶ ἀθρόοι φανῶσιν ὄρνιθες οἳ βιοτεύουσιν ἐν νήσῳ, ὕδωρ σημαίνουσιν· ἐὰν δὲ μέτριοι, ἀγαθὸν αἰξὶ καὶ βοτοῖς, ἐὰν δὲ πολλοὶ ὑπερβολῇ, αὐχμὸν ἰσχυρόν. ὅλως δὲ ὄρνιθες καὶ ἀλεκτρυόνες φθειριζόμενοι ὑδατικὸν σημεῖον, καὶ ὅταν μιμῶνται ὕδωρ ὡς ὗον.

18 Καὶ ἡ νῆττα ἥμερος <ἐὰν> ὑπιοῦσα ὑπὸ τὰ γεῖσα ἀποπτερυγίζηται, ὕδωρ σημαίνει, ὁμοίως δὲ καὶ κολοιοὶ καὶ ἀλεκτρυόνες, ἐάν τε ἐπὶ λίμνῃ ἢ θαλάττῃ ἀποπτερυγίζωνται, ὡς νῆττα ὕδωρ ση-

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[1] Plin. 18. 364; Verg. *Georg.* 1. 375.

[2] *ἐπιρροιζήσῃ*. Sc. with his wings probably; not, as LS. 'croaks.' Plin. (18. 362) seems to have had a fuller text, or to have drawn also on some other authority.

[3] *ὑετῶν ὄντων* can hardly mean 'while it is raining.'

licks his fore-hoof; if he puts[1] his head up towards the sky and snuffs the air, it is a sign of rain.

It is a sign of rain when a crow puts back its head on a rock which is washed by waves, or when it often dives or hovers over the water. It is a sign of rain if the raven, who is accustomed to make many different sounds, repeats one of these twice quickly and makes a whirring[2] sound and shakes his wings. So too if, during a rainy season,[3] he utters many different sounds, or if he searches for lice perched on an olive-tree. And if, whether in fair or wet weather, he imitates, as it were, with his voice falling drops, it is a sign of rain. So too is it if ravens or jackdaws fly high and scream[4] like hawks. And, if a raven in fair weather does not utter his accustomed note and makes a whirring with his wings,[5] it is a sign of rain.

It is a sign of rain if a hawk perches on a tree, flies right into it and proceeds to search for lice: also, when in summer a number of birds living on an island pack together: if a moderate number collect, it is a good sign for goats and flocks, while if the number is exceedingly large, it portends a severe drought. And in general it is a sign of rain when cocks and hens search for lice; as also when they make a noise like that of falling rain.

Again it is a sign of rain when a tame[6] duck gets under the eaves and flaps its wings. Also it is a sign of rain when jackdaws and fowls flap their wings whether on a lake or on the sea—like the duck. It

[4] *ἱερακίζωσιν.* ? 'hover like hawks.' However, Arat. 231 understood it to refer to the voice: so LS.

[5] *ἐπιρροιβδῇ.* Exact sense uncertain. *cf.* Soph. *Ant.* 1004.

[6] *ἥμερος.* ? *ἢ ἥμερος.*

μαίνει. καὶ ἐρωδιὸς ὄρθριον φθεγγόμενος ὕδωρ ἢ πνεῦμα σημαίνει· καὶ ἐὰν ἐπὶ θάλατταν πετόμενος βοᾷ, μᾶλλον ὕδατος σημεῖον ἢ πνεύματος, καὶ ὅλως βοῶν ἀνεμῶδες.

19 Καὶ ὁ σπίνος ἐν οἰκίᾳ οἰκουμένῃ ἐὰν φθέγξηται ἔωθεν, ὕδωρ σημαίνει ἢ χειμῶνα. καὶ χύτρα σπινθηρίζουσα πᾶσα περίπλεως ὕδατος σημεῖον. καὶ ἴουλοι πολλοὶ πρὸς τοῖχον ἕρποντες ὑδατικόν. δελφὶς παρὰ γῆν κολυμβῶν καὶ ἀναδυόμενος πυκνὰ ὕδωρ ἢ χειμῶνα σημαίνει.

20 Τμηττος ἐλάττων, ἄνυδρος καλούμενος, ἐὰν τῷ κοίλῳ νεφέλιον ἔχῃ, ὕδατος σημεῖον· καὶ ἐὰν ὁ μέγας Τμηττος τοῦ θέρους ἔχῃ νεφέλας ἄνωθεν καὶ ἐκ πλαγίου, ὕδατος σημεῖον. καὶ ἐὰν ὁ ἄνυδρος Τμηττος λευκὰς ἔχῃ ἄνωθεν καὶ ἐκ πλαγίου. καὶ ἐὰν περὶ ἰσημερίαν λίψ πνεύσῃ, ὕδωρ σημαίνει.

21 Αἱ δὲ βρονταὶ αἱ μὲν χειμεριναὶ καὶ ἑωθιναὶ μᾶλλον <ἄνεμον ἢ> ὕδωρ σημαίνουσιν· αἱ δὲ θεριναὶ μεσημβρίας καὶ ἑσπεριναὶ βρονταὶ ὑδατικὸν σημεῖον. ἀστραπαὶ δὲ ἐάν γε πανταχόθεν γένωνται, ὕδατος ἂν ἢ ἀνέμου σημεῖον, καὶ ἑσπεριναὶ ὡσαύτως. καὶ ἐὰν ἀκρωρίας νότου πνέοντος νοτόθεν ἀστράψῃ, ὕδωρ σημαίνει ἢ ἄνεμον. καὶ ζέφυρος ἀστράπτων πρὸς βορείου ἢ χειμῶνα ἢ ὕδωρ σημαίνει. καὶ θέρους αἱ ἑσπέριαι ἀστραπαὶ ὕδωρ αὐτίκα σημαίνουσιν ἢ

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[1] Sch. cites Plin. 18. 364, *vermes terreni erumpentes*, as representing this, which seems doubtful.

[2] *cf.* Plin. 18. 361; Cic. *Div.* 2. 70.

[3] ἐὰν τῷ. ? ἐὰν ἐν τῷ.

is a sign of wind or rain when a heron utters his note at early morning: if, as he flies towards the sea, he utters his cry, it is a sign of rain rather than of wind, and in general, if he makes a loud cry, it portends wind.

It is a sign of rain or storm if a chaffinch kept in the house utters its note at dawn. It is also a sign if any pot filled with water causes sparks to fly when it is put on the fire. It is also a sign of rain when a number of millepedes[1] are seen crawling up a wall. A dolphin[2] diving near land and frequently reappearing indicates rain or storm.

If the lesser Mount Hymettus, which is called the Dry Hill, has cloud in[3] its hollows, it is a sign of rain: so also is it, if the greater Hymettus has clouds in summer on the top and on the sides: or if the Dry Hymettus has white clouds on the top and on the sides; also if the south-west wind[4] blows at the equinox.

Thunder in winter and at dawn indicates wind[5] rather than rain; thunder in summer at midday or in the evening is a sign of rain. If lightning is seen from all sides, it will be a sign of rain or wind, and also if it occurs in the evening. Again, if when the south wind[6] is blowing at early dawn,[7] there is lightning from the same quarter, it indicates rain or wind. When the west wind is accompanied by lightning from the north, it indicates either storm or rain. Lightning in the evening in summer time indicates rain within three days, if not immediately.

[1] *cf.* Arist. *Probl.* 26. 26.
[5] ἄνεμον ἢ add. Furl. from Plin. 18. 354.
[6] *cf.* Soph. *Aj.* 257; Arist. *Probl.* 26. 20.
[7] ἀκρωρίας. *cf.* 42. So Arat. 216 renders.

τριῶν ἡμερῶν. καὶ ὀπώρας βορρᾶθεν ἀστραπαὶ ὑδατικὸν σημεῖον.

22 Ἡ Εὔβοια ὅταν διαζωσθῇ μέση, ὕδωρ διὰ ταχέων. καὶ ἐὰν ἐπὶ τὸ Πήλιον νεφέλη προσίζῃ, ὅθεν ἂν προσίζῃ, ἐντεῦθεν ὕδωρ ἢ ἄνεμον σημαίνει. ὅταν ἶρις γένηται, ἐπισημαίνει· ἐάν τε πολλαὶ ἶριδες γένωνται, σημαίνει ὕδωρ ἐπὶ πολύ. ἀλλὰ πολλάκις καὶ οἱ ὀξεῖς ἥλιοι, ὅταν ἐκ νεφέλης. μύρμηκες ἐν κοίλῳ χωρίῳ ἐὰν τὰ ᾠὰ ἐκφέρωσιν ἐκ τῆς μυρμηκιᾶς ἐπὶ τὸ ὑψηλὸν χωρίον, ὕδωρ σημαίνουσιν, ἐὰν δὲ καταφέρωσιν, εὐδίαν. ἐὰν παρήλιοι δύο γένωνται καὶ ὁ μὲν νοτόθεν ὁ δὲ βορρᾶθεν, καὶ ἅλως ἅμα ὕδωρ διὰ ταχέων σημαίνουσι. καὶ ἅλως αἱ μέλαιναι ὑδατικὸν καὶ μᾶλλον αἱ δείλης.

23 Ἐν τῷ Καρκίνῳ δύο ἀστέρες εἰσίν, οἱ καλούμενοι Ὄνοι, ὧν τὸ μεταξὺ τὸ νεφέλιον ἡ Φάτνη καλουμένη. τοῦτο ἐὰν ζοφῶδες γένηται, ὑδατικόν. ἐὰν μὴ ἐπὶ Κυνὶ ὕσῃ ἢ ἐπὶ Ἀρκτούρῳ, ὡς ἐπὶ τὸ πολὺ πρὸς ἰσημερίαν ὕδωρ ἢ ἄνεμος. καὶ τὸ δημόσιον τὸ περὶ τὰς μυίας λεγόμενον ἀληθές· ὅταν γὰρ δάκνωσι σφόδρα, ὕδατος σημεῖον. σπίνος φθεγγόμενος ἔωθεν μὲν ὕδωρ σημαίνει ἢ χειμῶνα, δείλης δὲ ὕδωρ.

24 Τῆς δὲ νυκτὸς ὅταν τὸν Ὕμηττον κάτωθεν τῶν ἄκρων νεφέλη διαζώσῃ λευκὴ καὶ μακρά, ὕδωρ γίνεται ὡς τὰ πολλὰ μετρίων ἡμερῶν. καὶ ἐὰν

[1] Evidently an Attic saying, of days when only the upper part of the Euboean mountains was visible.

Lightning from the north in late summer is a sign of rain.

[1] When Euboea has a girdle about it up to the waist, there will be rain in a short space. If cloud clings about Mount Pelion, it is an indication of rain or wind from the quarter to which it clings. When a rainbow appears, it is an indication of rain; if many rainbows appear, it is an indication of long-continued rain. So too is it often when the sun appears [2] suddenly out of cloud. It is a sign of rain if ants [3] in a hollow place carry their eggs up from the ant-hill to the high ground, a sign of fair weather if they carry them down. If two mock-suns [4] appear, one to the south, the other to the north, and there is at the same time a halo, these indicate that it will shortly rain. A dark halo round the sun indicates rain, especially if it occurs in the afternoon.

In the Crab are two stars called the Asses, and the nebulous space between them is called the Manger [5]; if this appears dark, it is a sign of rain. If there is no rain at the rising of the Dog or of Arcturus, there will generally be rain or wind towards the equinox. Also the popular saying about flies is true; when they bite excessively, it is a sign of rain. If a chaffinch [6] utters its note at dawn, it is a sign of rain or storm, if in the afternoon, of rain.

When at night a long stretch of white cloud encompasses Hymettus below the peaks, there will generally be rain in a few days. If cloud settles on

[2] *cf. H.P.* 8. 10. 3.
[3] Plin. 18. 364; Verg. *Georg.* 1. 379.
[4] *cf.* 29. [5] *cf.* 43, 51.
[6] *cf.* 19, of which this seems to be in part a repetition.

ἐν Αἰγίνῃ [καὶ] ἐπὶ τοῦ Διὸς τοῦ Ἑλλανίου νεφέλη καθίζηται, ὡς τὰ πολλὰ ὕδωρ γίνεται. ἐὰν ὕδατα πολλὰ γίνηται χειμερινά, τὸ ἔαρ ὡς τὰ πολλὰ γίνεται αὐχμηρόν· ἐὰν δ' αὐχμηρὸς ὁ χειμών, τὸ ἔαρ ὑδατῶδες. ὅταν χιόνες πολλαὶ γίνωνται, ὡς τὰ πολλὰ εὐετηρία γίνεται.

25 Φασὶ δέ τινες καὶ εἰ ἐν ἄνθραξι λαμπρὰ χάλαζα ἐπιφαίνηται, χάλαζαν προσημαίνειν ὡς τὰ πολλά· ἐὰν δὲ ὥσπερ κέγχροι μικροὶ λαμπροὶ πολλοί, ἀνέμου μὲν ὄντος εὐδίαν, μὴ ἀνέμου δὲ ὕδωρ ἢ ἄνεμον. ἔστι δ' ἄμεινον πρῶτον γίνεσθαι βόρειον ὕδωρ νοτίου καὶ τοῖς φυομένοις καὶ τοῖς ζῴοις· δεῖ δὲ γλυκὺ εἶναι καὶ μὴ ἁλμυρὸν τοῖς γευομένοις. καὶ ὅλως ἔτος βέλτιον νοτίου βόρειον καὶ ὑγιεινότερον. καὶ ὅταν <πάλιν> ὀχεύωνται πρόβατα ἢ αἶγες, χειμῶνος μακροῦ σημεῖον.

26 II. Ὕδατος μὲν οὖν ταῦτα λέγεται σημεῖα· ἀνέμου δὲ καὶ πνευμάτων τάδε. ἀνατέλλων ὁ ἥλιος καυματίας, κἂν μὴ ἀποστίλβῃ, ἀνεμώδες τὸ σημεῖον· καὶ ἐὰν κοῖλος φαίνηται ὁ ἥλιος, ἀνέμου ἢ ὕδατος τὸ σημεῖον. καὶ ἐὰν ἐπὶ πολλὰς ἡμέρας καυματίας, αὐχμοὺς καὶ ἀνέμους πολυχρονίους σημαίνει. ἐὰν αἱ ἀκτῖνες αἱ μὲν πρὸς βορρᾶν αἱ δὲ πρὸς νότον σχίζωνται τούτου μέσου

[1] So called also by Pind. *Nem.* 5. 19. Paus. 2. 30. 3 calls it the temple of Ζεὺς Πανελλήνιος, καὶ bracketed by Sch.
[2] *cf. C.P.* 2. 2.

the temple of Zeus Hellanios[1] in Aegina, usually rain follows. If a great deal of rain falls in winter, the spring is usually dry; if the winter has been dry, the spring is usually wet. When there is much[2] snow in winter, a good season generally follows.

Some say that, if in the embers[3] there is an appearance as of shining hail-stones, it generally prognosticates hail; while, if the appearance is like a number of small shining millet-seeds,[4] it portends fair weather, if there is wind at the time, but, if there is no wind, rain or wind. It is better both for plants and for animals that rain should come from the north before it comes from the south; it must however be fresh and not briny to the taste. And in general a season[5] in which a north wind prevails is better and healthier than one in which southerly winds prevail. It is a sign of a long winter when sheep or goats have a second[6] breeding season.

The signs of wind.

II. Such then are said to be the signs of rain. The following are signs of wind and breezes. [7] If the sun rises with a burning heat but does not shine brilliantly, it is a sign of wind. If the sun has a hollow appearance, it is a sign of wind or rain. If it blazes with a burning heat for several days, it portends long-continued drought or wind. If at dawn its rays are parted, some pointing to the north and some

[3] ἄνθρακι conj. Sch., supported by Plin. 18. 358; Arat. 309. ἀστράσι MSS.
[4] *cf.* 14, 42, 54. [5] *cf. C.P.* 2. 2.
[6] πάλιν ins. Sch.; text probably defective.
[7] Plin. 18. 342.

ὄντος κατ' ὄρθρον, κοινὸν ὕδατος καὶ ἀνέμου σημεῖόν ἐστιν.

27 Ἔστι δὲ σημεῖα ἐν ἡλίῳ καὶ σελήνῃ, τὰ μὲν μέλανα ὕδατος τὰ δ' ἐρυθρὰ πνεύματος. ἐὰν δὲ καὶ ὁ μεὶς βορείου ὄντος ὀρθὸς εἰστήκῃ, ζέφυροι εἰώθασιν ἐπιπνεῖν καὶ ὁ μὴν χειμερινὸς διατελεῖ. ὅταν μὲν ἡ κεραία <ἡ ἄνω> τοῦ μηνὸς ἐπικύπτῃ, βόρειος ὁ μείς· ὅταν δ' ἡ κάτωθεν, νότιος· ἐὰν δ' ὀρθὸς καὶ μὴ καλῶς ἐγκεκλιμένος μέχρι τετράδος καὶ εὔκυκλος, εἴωθε χειμάζειν μέχρι διχομηνίας. σημαίνει ζοφώδης μὲν ὢν ὕδωρ πυρώδης δὲ πνεῦμα.

28 Αἴθυιαι καὶ νῆτται [πτερυγίζουσαι] καὶ ἄγριαι καὶ τιθασσαὶ ὕδωρ μὲν σημαίνουσι δυόμεναι, πτερυγίζουσαι δὲ ἄνεμον. οἱ κέπφοι εὐδίας οὔσης ὅποι ἂν πέτωνται ἄνεμον προσημαίνουσι. στρουθοὶ χειμῶνος ἀφ' ἑσπέρας θορυβοῦντες ἢ ἀνέμου μεταβολὴν σημαίνουσιν ἢ ὕδωρ ὑέτιον. ἐρωδιὸς ἀπὸ θαλάσσης πετόμενος καὶ βοῶν πνεύματος σημεῖόν ἐστι· καὶ ὅλως βοῶν μέγα ἀνεμώδης.

29 Κύων κυλινδούμενος χαμαὶ μέγεθος ἀνέμου σημαίνει. ἀράχνια πολλὰ φερόμενα πνεῦμα ἢ χειμῶνα σημαίνει. ἡ ἄμπωτις βόρειον πνεῦμα σημαίνει, πλημμύρα δὲ νότιον. ἐὰν μὲν γὰρ ἐκ βορείων πλημμύρα ἥκῃ, εἰς νότιον μεταβάλλει, ἐὰν δ' ἐκ νοτίων ἄμπωτις γίνηται, εἰς βόρειον

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[1] Plin. 18. 343 suggests that this is the meaning: text perhaps defective. *cf.* Verg. *Georg.* 1. 445.

[2] *cf.* 38.

[3] Lit. 'the crescent moon has a northerly character.' ἡ ἄνω add. Furl.

to the south, while the orb itself is[1] clearly seen between, it is a sign of rain and wind.

Also black spots on the sun or moon indicate rain, red spots wind. Again, if, while a north wind blows, the horns[2] of the crescent moon stand out straight, westerly winds will generally succeed, and the rest of the month will be stormy. When the upper horn of the crescent moon is bent, northerly winds[3] will prevail for that part of the month: when the lower horn is bent, southerly winds will prevail. [4] If however the horns up to the fourth day point straight and have not a graceful bend inwards but round to a circle, it will generally be stormy till the middle of the month. If the moon is dusky, it indicates rain, if fiery, it indicates wind.

It is a sign of rain when gulls and ducks, whether wild or tame, plunge under water, a sign of wind when they flap their wings. Wherever the bird called *kepphos* flies during a calm, it is a sign of coming wind. If sparrows in winter begin to be clamorous at evening, it is a sign of a coming change or of a fall of rain. A heron flying from the sea and screaming is a sign that a breeze is coming: so is it in general a sign of wind when he screams loudly.

A dog rolling on the ground is a sign of violent wind. A number of cobwebs[5] in motion portends wind or storm. The ebb-tide indicates a north wind, the flowing tide a wind from the south. For, if the flowing tide sets from the north, there is a change to the south, and if an ebb-tide comes from the south, there is a change to the north. It is

[4] *cf.* 38; Plin. 18. 347; Verg. *Georg.* i. 428; the English sign, 'the young moon with the old moon in her arm.'
[5] Plin. 11. 84; Arist. *Probl.* 26. 61.

μεταβάλλει. θάλασσα οἰδοῦσα καὶ ἀκταὶ βοῶσαι καὶ αἰγιαλὸς ἠχῶν ἀνεμώδης. καὶ ὁ μὲν βορέας λήγων ἐλάττων ὁ δὲ νότος ἀρχόμενος. παρήλιος ὁπόθεν ἂν ᾖ ὕδωρ ἢ ἄνεμον σημαίνει.

30 Ἡ πέμπτη καὶ δεκάτη ἀπὸ τροπῶν τῶν χειμερινῶν ὡς τὰ πολλὰ νότιος. βορείων δὲ γινομένων ξηραίνει πάντα, νοτίων δὲ ὑγραίνει. ἐὰν δὲ νοτίων ὄντων ψοφῇ <τι> τῶν κεκολλημένων, εἰς τὰ νότια σημαίνει τὴν μεταβολήν· ἐὰν δὲ πόδες οἰδῶσι, νοτία ἡ μεταβολή. τὸ δὲ αὐτὸ σημεῖον καὶ ἐκνεφίου. καὶ ὀδαξῶν τὸν δεξιόν. ἐχῖνος ὁ χερσαῖος σημαντικόν· ποιεῖται δὲ δύο ὀπὰς ὅπου ἂν οἰκῇ, τὴν μὲν πρὸς βορρᾶν τὴν δὲ νοτόθεν· ὁποτέραν δ' ἂν ἀποφράττῃ, ἐντεῦθεν πνεῦμα σημαίνει, ἐὰν δ' ἀμφοτέρας, ἀνέμου μέγεθος.

31 Ἐὰν ὄρος . . ., πρὸς βορρᾶ ἄνεμον προσημαίνει. ἐὰν ἐν θαλάττῃ ἐξαίφνης πνεύματος γαλήνη γίνηται, μεταβολὴν πνεύματος ἢ ἐπίδοσιν. ἐὰν ἄκραι μετέωροι φαίνωνται ἢ καὶ νῆσοι ἐκ μιᾶς πλείους, νοτίαν μεταβολὴν σημαίνει· γῆ τε μέλαινα ὑποφαινομένη <βόρειον>, λευκὴ δὲ νότιον. αἱ ἅλωνες περὶ τὴν σελήνην πνευματώδεις μᾶλλον ἢ περὶ ἥλιον· σημαίνουσι δὲ πνεῦμα ῥαγεῖσαι περὶ ἄμφω, καὶ ᾗ ἂν ῥαγῇ ταύτῃ πνεῦμα. ἐπι-

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[1] *cf.* 40; Plin. 18. 359; Verg. *Georg.* 1. 356.

[2] *cf.* Arist. *Probl.* 26. 12 *ad fin.*

[3] *ξηραίνει, ὑγραίνει* seem to be used quasi-impersonally; but the text is perhaps defective.

[4] *νότια* MSS.; *βόρεια* conj. Furl., surely with good reason. *cf.* Arist. *Probl.* 1. 24.

[5] After *δεξιόν* Sch. and W. mark a lacuna, which does not seem necessary.

[6] *cf.* Arist. *H.A.* 9. 6 *ad fin.*

a sign of wind when the sea[1] has a swell or promontories moan or there is loud noise on the beach. Now the north wind has less force as it ceases to blow, the south wind as it begins. A mock sun, in whatever quarter it appears, indicates rain or wind.

The fifteenth[2] day after the winter solstice is generally marked by southerly winds. If there is a northerly wind, everything gets dried[3] up, if a southerly, there is abundant moisture. If, while a south wind is blowing, glued articles make a cracking sound, it indicates a change to a south[4] wind. If the feet swell, there will be a change to a south wind. This also sometimes indicates a hurricane. So too does it, if a man has a shooting pain in the right foot.[5] The behaviour[6] of the hedgehog is also significant: this animal makes two holes wherever he lives, one towards the north, the other towards the south: now whichever hole he blocks up, it indicates wind from that quarter, and, if he closes both, it indicates violent wind.

If a mountain . . . ,[7] it indicates wind from the north. If at sea during a wind there is a sudden calm, it indicates a change or an increase of wind. If promontories[8] seem to stand high out of the sea, or a single island looks like several, it indicates a change to south wind. If the land looks black from the sea, it indicates a north wind,[9] if white, a south wind. A halo[10] about the moon signifies wind more certainly than a halo about the sun: but in either case, if there is a break in the halo, it indicates wind, which will come from the quarter in which the break is. If the sky is overcast in whatever quarter

[7] I have marked a lacuna after *ὄρος*. Furl. renders *si mons versus aquilonem extenditur, venti signum est*, with what meaning I cannot see. [8] *cf.* Arist. *Meteor.* 3. 4 *ad init.*
[9] *βόρειον* add. Furl. [10] *cf.* 51.

νεφέλων ὅθεν ἂν ἀνατέλληται, ἐντεῦθεν ἄνεμος. αἱ κηλάδες[1] νεφέλαι θέρους ἄνεμον σημαίνουσι.

32 Ἐὰν ἀστραπὴ πανταχόθεν γίνηται, ὕδωρ σημαίνει, καὶ ὅθεν ἂν αἱ ἀστραπαὶ πυκναὶ γίνωνται, ἐντεῦθεν πνεύματα γίνεται. θέρους ὅθεν ἂν ἀστραπαὶ καὶ βρονταὶ γίνωνται, ἐντεῦθεν πνεύματα γίνεται ἰσχυρά· ἐὰν μὲν σφόδρα καὶ ἰσχυρὸν ἀστράπτῃ, θᾶττον καὶ σφοδρότερον πνεύσουσιν, ἐὰν δ' ἠρέμα καὶ μανῶς, κατ' ὀλίγον. τοῦ δὲ χειμῶνος καὶ φθινοπώρου τοὐναντίον· παύουσι γὰρ τὰ πνεύματα αἱ ἀστραπαί· καὶ ὅσῳ ἂν ἰσχυρότεραι γίνωνται ἀστραπαὶ καὶ βρονταί, τοσούτῳ μᾶλλον παύονται· τοῦ δ' ἔαρος ἧττον ἂν ταὐτὰ σημεῖα λέγω, ὥσπερ καὶ χειμῶνος.

33 Ἐὰν νότου πνέοντος βορρᾶθεν ἀστράπτῃ, παύεται· ἐὰν ἔωθεν ἀστράπτῃ εἴωθε παύεσθαι τριταῖος, οἱ δὲ ἄλλοι πεμπταῖοι ἑβδομαῖοι ἐννεαταῖοι, οἱ δὲ δειλινοὶ ταχὺ παύονται. οἱ βορέαι παύονται ὡς ἐπὶ τὸ πολὺ ἐν περιτταῖς οἱ δὲ νότοι ἐν ἀρτίαις. ἄνεμοι αἴρονται ἀμ' ἡλίῳ ἀνατέλλοντι καὶ σελήνῃ. ἐὰν ἀνατέλλων ὁ ἥλιος καὶ σελήνη παύσωσιν, ἐπιτείνει τὰ πνεύματα· χρονιώτερα δὲ καὶ ἰσχυρότερα τὰ πνεύματα γίνεται τὰ ἡμέρας ἢ νύκτωρ ἀρχόμενα.

34 Ἐὰν ἐτησίαι πολὺν χρόνον πνεύσωσι καὶ μετόπωρον γένηται ἀνεμῶδες, ὁ χειμὼν νήνεμος γίνεται, ἐὰν δ' ἐναντίως, καὶ ὁ χειμὼν ἐναντίος.

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[1] *κηλάδες*, *i.e.* a 'mackerel sky' (?) The word seems to occur nowhere else except in Hesych., who renders *ἄνυδροι*: derivation obscure. It should probably be read in § 51 for *κοιλάδες*. [2] Plin. 18. 354.

[3] *ἄν*. Sc. *εἶναι*, which perhaps should be added.

the sun is first seen, there will be wind from that quarter. Light[1] clouds in summer-time indicate wind.

If lightning comes from all sides, it indicates rain, and from any quarter from which the flashes come in quick succession there will be wind. In summer[2] from whatever quarter lightning and thunder come, there will be violent winds: if the flashes are brilliant and startling, the wind will come sooner and be more violent; if they are of gentler character and come at longer intervals, the wind will get up gradually. In winter and autumn however the reverse happens, for the lightning causes the wind to cease: and, the more violent the lightning and thunder are, the more will the wind be reduced. In spring I consider that the indications would[3] not so invariably have the same meaning,—and this is also true of winter.

If, while a south wind is blowing, there comes lightning from the north, the wind ceases. If there is lightning at dawn, the wind generally ceases on the third day: other winds than a south wind however do not cease till the fifth seventh or ninth day, though a wind which got up in the afternoon will cease sooner. A north[4] wind generally ceases in an odd, a south wind in an even number of days. Winds get up at sunrise or moonrise. If the rising sun or moon have caused the wind to cease, presently[5] it gets up again with more force, and winds which begin to blow in the day-time last longer and are stronger than those which begin at night.

If periodic winds have been blowing for a long time, and a windy autumn follows, the winter is windless: if however the contrary happens, the character

[4] Plin. 2. 129.

[5] So Furl. renders: W. inserts μὴ after σελήνη.

πρὸς κορυφῆς ὄρους ὁπόθεν ἂν νεφέλη μηκύνηται, ταύτῃ ἄνεμος πνευσεῖται. αἱ νεφέλαι ἐκ τῶν ὄπισθεν προσίζουσαι καὶ ὄπισθεν πνευσοῦνται. Ἄθως μέσος διεζευγμένος νότιος, καὶ ὅλως τὰ ὄρη διεζωσμένα νότια ὡς τὰ πολλά. οἱ κομῆται ἀστέρες ὡς τὰ πολλὰ πνεύματα σημαίνουσιν, ἐὰν δὲ πολλοί, καὶ αὐχμόν. μετὰ χιόνα νότος, μετὰ πάχνην βορέας εἴωθε πνεῖν. μύκητες ἐπὶ λύχνου νότιον πνεῦμα ἢ ὕδωρ σημαίνουσιν.

Αἱ δὲ στάσεις τῶν πνευμάτων οὕτως ἔχουσιν ὡς ἐν τῷ γράμματι διώρισται. τῶν δ' ἀνέμων ἔτι πνέουσι τοῖς ἄλλοις ἐπιπίπτουσι μάλιστα ἀπαρκτίας θρακίας ἀργέστης. ὅταν δὲ μὴ ὑπ' ἀλλήλων διαλύωνται τὰ πνεύματα, ἀλλ' αὐτὰ καταμαρανθῶσι, μεταβάλλουσιν εἰς τοὺς ἐχομέ-

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[1] *cf.* 22. [2] *cf.* 57.

[3] *cf. de Ventis* 50; Arist. *Probl.* 26. 3. [4] *cf.* 14, 25, 42, 54.

[5] The 'figure' (giving points of the compass) has not been preserved. Arist. *Meteor.* 2. 6. describes such a figure (ὑπογραφή), which may be reconstructed thus :—



of winter is also reversed. From whatever quarter cloud streams out from a mountain peak, wind will blow in the direction thus indicated. Clouds which cling to the back of the mountain will also produce wind from the back of it. If there is a girdle[1] of cloud half way up Mount Athos, and if mountains in general wear such a girdle, there will generally follow a southerly wind. Comets[2] usually indicate wind, and, if there are many of them, drought is also indicated. After snow[3] a south wind, after hoar-frost a north wind generally blows. Snuff[4] in a lamp indicates wind or rain from the south.

The points from which the winds come are as they are given in the figure.[5] The winds which most often come on the top of other winds while these are still blowing are the north wind (*aparktias*),[6] the north-north-east and the north-west. When however the winds are not dispersed by one another but die down of their own accord, they change[7] to the next winds on the figure, reckoning from left

Arist. does not seem to distinguish *βορέας* and *ἀπαρκτίας*: his *θρασκίας* is T.'s *θρακίας*: his eight principal winds (underlined in diagram) correspond to those represented on the famous Tower of the Winds at Athens, built about two hundred years later.

[6] *cf.* Arist. *l.c.* [7] Plin. 2. 128.

νους ἐπὶ δεξιά, ὥσπερ ἡ τοῦ ἡλίου ἔχει φορά. ὁ νότος ἀρχόμενος ξηρὸς τελευτῶν δὲ ὑγρός. καὶ ὁ εὖρος. ὁ δ' ἀπηλιώτης ἀπὸ ἀνατολῆς ἰσημερινῆς ὑδατώδης· διὰ λεπτῶν δὲ ἄγει τὰ ὕδατα.

36 Ὑγροὶ δὲ μάλιστα ὅ τε καικίας καὶ λίψ· χαλαζώδης δ' ἀπαρκτίας καὶ θρακίας καὶ ἀργέστης· νιφετώδης δὲ ὅ τε μέσης [ἢ βορέας] καὶ ἀπαρκτίας· καυματώδης δὲ νότος καὶ ζέφυρος καὶ εὖρος· οἱ μὲν οἷς ἂν ἐκ πελάγους προσπίπτωσιν, οἱ δὲ οἷς ἂν διὰ γῆς. δασύνουσι δ' οὐρανὸν νέφεσι καὶ καλύπτουσι καικίας μάλιστα· εἶτα λίψ. καὶ οἱ μὲν ἄλλοι ἄνεμοι ἀφ' ἑαυτῶν τὰ νέφη ὠθοῦσι, καικίας δὲ μόνος πνέων εἰς ἑαυτόν. αἴθριοι δὲ μάλιστα θρακίας καὶ ἀργέστης καὶ τῶν λοιπῶν ἀπαρκτίας· ἐκνεφίαι δὲ μάλιστα ὅ τε ἀπαρκτίας καὶ ὁ θρακίας καὶ ὁ ἀργέστης.

37 Γίνονται δὲ ἐκνεφίαι ὅταν εἰς ἀλλήλους ἐμπίπτωσι πνέοντες μάλιστα μὲν μετοπώρου τῶν δὲ λοιπῶν ἔαρος. ἀστραπαῖος δὲ θρακίας· καὶ ἀργέστης καὶ ἀπαρκτίας καὶ μέσης. ἐὰν ἐν τῇ θαλάττῃ πάπποι φέρωνται πολλοὶ οἱ γινόμενοι ἀπὸ τῶν ἀκανθῶν, ἄνεμον σημαίνουσιν ἔσεσθαι μέγαν. ὅθεν ἂν ἀστέρες διάττωσι πολλοί, ἄνεμον

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[1] I have bracketed *ἢ βορέας* as probably a gloss on *ἀπαρκτίας*; ἢ is difficult to account for otherwise. See diagram.

[2] Plin. 18. 360.

to right according to the course of the sun. When the south wind begins to blow, it is dry, but it becomes wet before it ceases: so too does the south-east wind. The east wind, coming from the quarter where the sun rises at the equinox, is wet: but it brings the rain in light showers.

The north-east and south-west are the wettest winds; the north the north-north-east and the north-east bring hail; snow comes with the north-north-east[1] and north. The south, the west, and the south-east winds bring heat. Some of these have their effect on places which they strike as they come from the sea, others on places which they visit as they come over land. The winds which more than any others make the sky thick with cloud and completely cover it are the north-east and the south-west, especially the former. While the other winds repel the clouds from themselves, the north-east alone attracts them as it blows. Those winds which chiefly bring a clear sky are the north-north-west and the north-west, and next after them the north. Those which most have the character of a hurricane are the north the north-north-west and the north-west.

They acquire this character when they fall upon one another as they blow, especially in autumn, but to some extent in spring. Those which are accompanied by lightning are the north-north-west the north-west the north and the north-north-east. If at sea[2] a quantity of down is seen blown along, which has come from thistles, it indicates that there will be a great wind. Wind[3] may be expected from any quarter in which a number of shooting stars are

[3] *cf.* 13; Plin. 18. 352; Verg. *Georg.* 1. 365.

ἐντεῦθεν· ἐὰν δὲ πανταχόθεν ὁμοίως, πολλὰ πνεύματα σημαίνουσι.

Πνευμάτων μὲν οὖν σημεῖα ταῦτα.

38 III. Χειμῶνος δὲ τάδε. ἥλιος δυόμενος εἰς μὴ καθαρόν. καὶ ὡς ἂν μερισθῇ δυόμενος, οὕτως αἱ ἡμέραι ἐπιτελοῦνται. οἷον εἰ τὸ τρίτον μέρος· ἀπολειφθείη[1] ἢ τὸ ἥμισυ. τὸ σελήνιον ἐὰν ὀρθὸν ᾖ μέχρι τετράδος καὶ εἰ εὔκυκλον, χειμάσει μέχρι διχοτόμου· γέρανοι ἐὰν πρωὶ πέτωνται καὶ ἀθρόοι, πρωὶ χειμάσει, ἐὰν δὲ ὀψὲ καὶ πολὺν χρόνον, ὀψὲ χειμάσει. καὶ ἐὰν ὑποστραφῶσι πετόμενοι, χειμῶνα σημαίνουσι.

39 Χῆνες βοῶντες μᾶλλον ἢ περὶ σῖτον μαχόμενοι χειμέριον. σπίνος στρουθὸς σπίζων ἔωθεν χειμέριον. ὄρχιλος [ὡς] εἰσιὼν καὶ εἰσδυόμενος εἰς ὀπὰς χειμῶνα σημαίνουσι καὶ ἐριθεὺς ὡσαύτως. κορώνη ἐὰν ταχὺ δὶς κρώζῃ καὶ τρίτον, χειμερία. καὶ κορώνη καὶ κόραξ καὶ κολοιὸς ὀψὲ ἄδοντες χειμέριοι. στρουθὸς ἐὰν λευκὸς ἢ χελιδὼν ἢ ἄλλο τι τῶν μὴ εἰωθότων λευκῶν, χειμῶνα μέγαν σημαίνουσιν, ὥσπερ καί, μέλανες ἐὰν πολλοὶ φανῶσιν, ὕδωρ.

40 Καὶ ἐὰν ἐκ πελάγους ὄρνιθες φεύγωσι, χειμῶνα σημαίνουσι. καὶ σπίνος ἐν οἰκίᾳ οἰκουμένῃ φθεγγόμενος χειμέριον. ὅσα ὕδωρ σημαίνει, χειμῶνα ἄγει, ἐὰν μὴ ὕδωρ, χιόνα καὶ χειμῶνα.

[1] *i.e.* and the succeeding day will be more or less stormy in proportion. ἀπολειφθείη. ? ἀπολῃφθείη = 'may be obscured.'

[2] *cf.* 27. *i.e.* it is possible, more or less, to see the whole circle.

seen. If these appear in every quarter alike, it indicates many winds.

Such then are the signs of winds.

III. The following are signs of storm. The sun becoming obscured as it sinks indicates storm. And, according as its orb is divided as it sets, so the succeeding days turn out; for instance, a third or a half of the orb may remain visible.[1] If the horns [2] of the moon point straight up till the fourth day, and if it rounds to a circle, it will be stormy till the middle of the month. If cranes fly early and in flocks, it will be an early winter[3]; if they fly late and for a long time, it will be a late winter; and, if they wheel as they fly, it indicates stormy weather.

[4] It is a sign of storm when geese make more clamour than usual or fight for their food; so too is it when a sparrow or chaffinch twitters at dawn. It indicates a storm when the goldcrest[5] goes into holes and hides itself; so also when the redbreast does the same. It is a sign of storm when the crow caws twice in quick succession and then a third time; also when the crow or raven or jackdaw makes its call late. It is a sign of a great storm when a white sparrow or swallow is seen, or a white specimen of any other bird which is not usually white, even as the appearance of a large number of such birds of a dark colour signifies rain.

It is also an indication of storm when birds flee from the sea. A chaffinch uttering its note in an inhabited house is a sign of storm. All the signs which indicate rain bring stormy weather, that is to say, snow and storm, if not rain. If the raven utters

[3] So Arat. 343 f. interprets. [4] Plin. 18. 363.
[5] ὡς bracketed by Sch.

κόραξ φωνὰς πολλὰς μεταβάλλων χειμῶνος χειμέριον. κολοιοὶ ἐκ τοῦ νότου πετόμενοι καὶ τευθίδες[1] χειμέριαι. φωνὴ ἐν λιμένι ἀποψοφοῦσα καὶ πολύπλοκον[2] ἠχοῦσα χειμέριον. καὶ οἱ πνεύμονες[3] οἱ θαλάττιοι ἐὰν πολλοὶ φαίνωνται ἐν τῷ πελάγει, χειμερινοῦ ἔτους σημεῖον. πρόβατα ἐὰν πρωὶ ὀχεύηται, πρώϊον χειμῶνα σημαίνουσι.

41 Μετοπώρῳ ἐὰν πρόβατα ἢ βόες ὀρύττωσι καὶ κοιμῶνται ἀθρόοι πρὸς ἀλλήλους ἔχοντες τὰς κεφαλάς, τὸν χειμῶνα χειμέριον σημαίνει. ἐν δὲ τῷ Πόντῳ φασίν, ὅταν Ἀρκτοῦρος ἀνατείλῃ θᾶττον, ἐναντίους τῷ βορρᾷ νέμεσθαι. βόες μᾶλλον ἐσθίοντες τοῦ εἰωθότος καὶ ἐπὶ τὸ δεξιὸν κατακλινόμενοι χειμέριον. καὶ ὦτα κρούων ὄνος χειμέριον· καὶ μαχόμενα πρόβατα καὶ ὄρνιθες περὶ σίτου· παρὰ τὸ ἔθος· προπαρασκευάζονται γάρ· καὶ μῦες τρίζοντες καὶ ὀρχούμενοι χειμέριον.

42 Καὶ κύων τοῖς ποσὶν ὀρύττουσα καὶ ὀλολυγὼν ᾄδουσα μόνη ἀκρωρίας χειμέριον. γῆς ἕντερα πολλὰ φαινόμενα χειμῶνα σημαίνει. καὶ ἐὰν πῦρ μὴ θέλῃ ἅπτεσθαι, χειμέριον· καὶ ἐὰν λύχνος ἅπτεσθαι μὴ ἐθέλῃ, χειμῶνα σημαίνει· καὶ τέφρα πηγνυμένη νιφετόν. λύχνος εὐδίας ἡσυχαῖος καιόμενος χειμῶνα σημαίνει· καὶ ἐὰν χειμῶνος ὄντος μύκαι μέλαιναι ἐπιγίνωνται, χειμῶνα σημαίνει· καὶ ἐὰν ὥσπερ κέγχροις πολλοῖς κατά-

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[1] τευθίδες. The word is perhaps corrupt and conceals the name of a bird.

[2] *cf.* 21, 29. πολύπλοκον is Furlanus' conj. for Vulg. πολύποδον.

[3] πνεύμονες. Plin. 18. 359. *pulmones*: *cf.* 9. 154.

a great variety of sounds in winter, it is a sign of storm. Jackdaws flying from the south are a sign of storm, and so are cuttle-fish.[1] It is a sign of storm when a loud[2] voice is heard in harbour, which is re-echoed many times. It is a sign of a stormy season when a number of jelly-fish[3] appear in the sea. It indicates an early winter when the breeding season of sheep begins early.

If in autumn sheep or oxen dig holes and lie keeping their heads close to one another, it indicates a severe winter. They say that in Pontus when Arcturus rises, (the cattle[4]) face northwards as they graze. It is a sign of storm when cattle eat more than usual and lie down on their right sides.[5] So is it when the ass shakes[6] his ears, or when sheep or birds fight for their food more than usual, since they are then trying to secure a store against bad weather: also when mice squeak and dance.

A bitch digging holes with her paws and a tree-frog croaking alone at early dawn[7] are signs of storm: it indicates storm when a number of the worms[8] called 'the earth's entrails' appear. It is a sign of storm if the fire refuses to catch, or if a lamp refuses to light: while, if much ash is formed, it is a sign of snow. If a lamp burns steadily in fine weather, it is a sign of storm: so is it if in winter-time dark snuff[9] forms: if it is, as it were, full of numerous millet-seeds, there will be stormy weather;

[4] *θᾶττον* is clearly corrupt, and words indicating what the sign portends are missing. [5] *cf.* 54.

[6] *ὦτα κρούων* doubtful. Sch. suggests *οὖδας* for *ὦτα*.

[7] *ἀκρωρίας*. *cf.* 21.

[8] *γῆς ἔντερα*. So Arat. 225 explains. One might guess 'worm-casts.'

[9] *cf.* 14, 25, 34, 54.

πλεως ᾖ, χειμερίσει· καὶ ἐὰν κύκλῳ περὶ τὸ λαμπρὸν ὦσιν εὐδίας οὔσης, χιονικόν.

43 Ἡ τοῦ ὄνου Φάτνη εἰ συνίσταται καὶ ζοφερὰ γίνεται, χειμῶνα σημαίνει. καὶ ἐὰν ἀστραπὴ λαμπρὰ μὴ ἐν τῷ αὐτῷ μένῃ, χειμέριον. ἐπὶ Πλειάδι δυομένῃ ἐὰν λάμψῃ κατὰ Πάρνηθα καὶ Βρίλητtον καὶ Ὕμηττον, ἐὰν μὲν ἅπαντα καταλάμψῃ, μέγαν χειμῶνα σημαίνει, ἐὰν δὲ τὰ δύο, ἐλάττω, ἐὰν δὲ Πάρνηθα μόνον, εὐδιεινόν· καὶ ἐὰν χειμῶνος ὄντος νεφέλη μακρὰ ἐπὶ τὸν Ὕμηττον ᾖ, χειμῶνος ἐπίτασιν σημαίνει. Ἄθως καὶ Ὄλυμπος καὶ ὅλως ὀρέων κορυφαὶ κατεχόμεναι ὑπὸ νεφελῶν χειμέριον. ἐὰν εὐδίας γινομένης νεφέλιον φαίνηται ἐν τῷ ἀέρι παρατεταμένον καὶ τιλλόμενον, οὕπω παύεται ὁ χειμών.

44 Ἐὰν τὸ μετόπωρον εὐδιεινὸν παρὰ τὸ εἰκὸς γένηται, τὸ ἔαρ γίνεται ψυχρὸν ὡς τὰ πολλά. ἐὰν πρωὶ χειμάζειν ἄρξηται, πρωὶ παύεται καὶ ἔαρ καλόν, ἐὰν δὲ τοὐναντίον, καὶ ἔαρ ὄψιον ἔσται. ἐὰν χειμὼν ὑέτιος, τὸ ἔαρ αὐχμηρόν, ἐὰν δ' αὐχμηρὸς ὁ χειμών, τὸ ἔαρ καλόν. ἐὰν ἡ ὄπωρα γίνηται ἐπιεικής, τὰ πολλὰ γίνεται τοῖς προβάτοις λιμός. ἐὰν τὸ ἔαρ καὶ τὸ θέρος ψυχρὰ γίνηται, ἥ τε ὄπωρα γίνεται καὶ <τὸ> μετόπωρον πνιγηρὸν καὶ οὐκ ἀνεμῶδες.

45 Οἱ πρῖνοι ἐὰν εὐκαρπῶσι, χειμῶνες πολλοὶ σφόδρα γίνονται. ἐὰν ἐπὶ κορυφῆς ὄρους νέφος ὀρθὸν στῇ, χειμῶνα σημαίνει, ὅθεν καὶ Ἀρχίλοχος ἐποίησε "Γλαῦχ' ὥρα· βαθὺς γὰρ ἤδη κύμασιν

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[1] ὄνου φάτνη. *cf.* 23, 51. See LS, *s.v.* ὄνος ; Theocr. 22. 21. Plin. 18. 353, *sunt in signo Cancri duae stellae parvae*

and if these in fine weather appear in a circle round the flame, it is a sign of snow.

If the 'Ass's Manger[1]' shrinks in size and becomes dark, it is a sign of storm; also if there is vivid lightning which does not remain in the same quarter. If at the setting of the Pleiad there is lightning over Parnes Brilessus and Hymettus—when it appears over all three mountains, it indicates a great storm; when over the two lesser heights, a less violent storm; when over Parnes alone, fine weather. Again, if during a storm a long cloud stretches over Hymettus, it signifies that the storm will increase in force. It is a sign of storm when Athos Olympus and mountain-peaks in general are covered with clouds. If during fine weather a cloud appears in the sky stretching a long way and torn to shreds, stormy weather will continue.

If the autumn is unusually fine, the succeeding spring is generally cold. If winter begins early, it ends early and there is a fair spring; if the reverse, spring will also be late. If the winter is wet, the spring will be dry, if the winter is dry, the spring will be fair. If the late summer is satisfactory, the sheep will generally suffer from hunger. If the spring and summer are cold, the late summer and autumn[2] will be stifling hot and windless.

If the kermes-oak[3] fruits well, there follows a long succession of storms. If a cloud stands upright on a mountain-peak, it indicates storm; whence Archilochus' lines "Mark you,[4] Glaucus; deep ocean

aselli appellatae, exiguum inter illas spatium obtinente nubecula, quam praesepia appellant. [2] τὸ add. Sch. [3] *cf.* 49.

[4] A comparison of war to stormy weather. Quoted also by Plut. *de Superstitione*, 72, and by Heraclides, *Allegoriae Homericae*, 4. In both citations the Greek is corrupt.

ταράσσεται Πόντος ἀμφὶ δ' ἄκρα <Γυρῶν> ὀρθὸν ἵσταται νέφος Σῆμα χειμῶνος." ἐὰν δ' ὁμόχρων ᾖ ὑμένι λευκῷ, χειμέριον. ὅταν ἑστώτων νεφῶν ἕτερα ἐπιφέρηται τὰ δ' ἠρεμῇ, χειμέρια.

46 <Ὁ ἥλιος> ἐὰν χειμῶνος διαλάμψας πάλιν ἀποκρυφθῇ καὶ τοῦτο ποιήσῃ δὶς ἢ τρίς, ἡμέρα χειμέριος δίειsιν. ὁ τοῦ Ἑρμοῦ ἀστὴρ χειμῶνος μὲν φαινόμενος ψύχη σημαίνει θέρους δὲ καῦμα. ὅταν μέλιτται μὴ ἀποπέτωνται μακρὰν ἀλλ' αὐτοῦ ἐν τῇ εὐδίᾳ πέτωνται, χειμῶνα ἐσόμενον σημαίνει. λύκος ὠρυόμενος χειμῶνα σημαίνει διὰ τριῶν ἡμερῶν. λύκος ὅταν πρὸς τὰ ἔργα ὁρμᾷ ἢ εἴσω χειμῶνος ὥρᾳ, χειμῶνα σημαίνει εὐθύς.

47 Ἔστι δὲ σημεῖον χειμώνων μεγάλων καὶ ὄμβρων καὶ ὅταν γένωνται ἐν τῷ μετοπώρῳ πολλοὶ σφῆκες, καὶ ὅταν ὄρνιθες λευκοὶ πρὸς τὰ ἐργάσιμα πλησιάζωσι, καὶ ὅλως τὰ ἄγρια θηρία ἐὰν πρὸς τὰ ἐργάσιμα, βόρειον καὶ χειμῶνος μέγεθος σημαίνει. τῆς Πάρνηθος ἐὰν τὰ πρὸς ζέφυρον ἄνεμον καὶ τὰ πρὸς Φύλης φράττηται νέφεσι βορείων ὄντων, χειμέριον τὸ σημεῖον.

48 Ὅταν πνίγη γίνηται ἰσχυρά, ὡς τὰ πολλὰ ἀνταποδίδωσι καὶ γίνεται χειμὼν ἰσχυρός. ἐὰν ὕδατα ἐαρινὰ πολλὰ γένηται, καύματα ἰσχυρὰ ἐν τοῖς πεδινοῖς καὶ κοίλοις γίνεται. δεῖ οὖν τὴν ἀρχὴν ὁρᾶν. ἐὰν τὸ μετόπωρον εὐδιεινὸν γίνηται

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[1] Γυρῶν. γυροῦν W. Heraclides gives γυρεὸν, Plut. γυρεῖον; but one MS. of Plut. gives γύρων with a marginal gloss 'sc. πετρῶν,' which suggests that the word is a proper name. *Od.* 4. 500 mentions the Γύραι (*i.e.* the 'round-backed rocks')

is now stirred up with waves, and about the heights of the Gyrae [1] there rises a cloud erect, the sign of storm." If the clouds are of uniform colour, like [2] a white membrane, it is a sign of storm. When, as some clouds are motionless, others move towards them while they remain at rest, it is a sign of storm.

If the sun in winter after gleaming out is again obscured, and this is repeated two or three times, it will be stormy all day. If the star Hermes appears in winter, it indicates cold, if in summer, heat. When in fine weather bees do not fly [3] long distances, but fly about where they are, it indicates that there will be a storm. The howling of a wolf indicates a storm within three days. When a wolf approaches or enters cultivated ground in the season of winter, it indicates that a storm will come immediately.

It is also a sign of great storms and heavy rain when many wasps appear in autumn, or when white birds [4] approach cultivated lands; and in general when wild creatures approach such lands, it indicates a north wind and a severe storm. If the western side of Parnes and the side towards Phyle are blocked with clouds during a north wind, it is a sign of storm.

When there is severe heat, generally there is compensation and a severe winter follows. If there is much rain in spring, it is followed by severe heat in low-lying districts and valleys; so that one should mark how the season begins. If the autumn is

where Aias Oileus perished. The word is missing in the MSS. of T.

[2] *ὁμοῖον* has perhaps dropped out after *ὁμόχρων ἦ*; the adjective seems to agree with *νέφος*.

[3] *cf.* Arist. *H.A.* 9. 40 *ad fin.*

[4] Plin. 18. 363: presumably gulls, etc.

σφόδρα, τὸ ἔαρ ὡς τὰ πολλὰ γίνεται ψυχρόν· ἐὰν δὲ τὸ ἔαρ ὄψιον γένηται καὶ ψυχρόν, ἡ ὄπωρα ὀψία γίνεται καὶ <τὸ> μετόπωρον ὡς τὰ πολλὰ πνιγηρόν.

49 Οἱ πρῖνοι ὅταν εὐκαρπῶσι σφόδρα, ὡς μὲν τὰ πολλὰ χειμῶνα ἰσχυρὸν σημαίνουσιν, ἐνίοτε δὲ καὶ αὐχμούς φασι γίνεσθαι. καὶ ἐάν τις σπάλακα λαβὼν ὑποπάσας ἄργιλον εἰς πιθάκνην θῇ, σημαίνει ταῖς φωναῖς αἷς ἀφίησιν ἄνεμον καὶ εὐδίαν. καὶ τὸ πανταχοῦ δὲ λεγόμενον σημεῖον δημόσιον χειμέριον, ὅταν μῦες περὶ φορυτοῦ μάχωνται καὶ φέρωσιν.

50 IV. Εὐδίας δὲ σημεῖα τάδε. ἥλιος μὲν ἀνιὼν λαμπρὸς καὶ μὴ καυματίας καὶ μὴ ἔχων σημεῖον μηδὲν ἐν ἑαυτῷ εὐδίαν σημαίνει. ὡς δ' αὕτως σελήνη πανσελήνῳ. καὶ δυόμενος ἥλιος χειμῶνος εἰς καθαρὸν εὐδιεινός, ἐὰν μὴ ταῖς προτέραις ἡμέραις εἰς μὴ καθαρὸν δεδυκὼς ᾖ ἐξ εὐδιῶν· οὕτω δὲ ἄδηλον. καὶ ἐὰν χειμάζοντος ἡ δύσις γένηται εἰς καθαρόν, εὐδιεινόν· καὶ ἐὰν δύνων χειμῶνος ὠχρὸς ᾖ, εὐδίαν σημαίνει.

51 Καὶ ὁ μεὶς ἐὰν τριταῖος ὢν λαμπρὸς ᾖ, εὐδιεινόν. καὶ ἡ τοῦ ὄνου Φάτνη ὅτε ἂν καθαρὰ καὶ λαμπρὰ φαίνηται, εὐδιεινόν. ἄλως δὲ ἐὰν ὁμαλῶς

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[1] τὸ add. Sch. [2] *cf.* 45.

[3] σπάλακα Vulg.; σπάκα Bas. Ald.; σκολόπακα (woodcock?) conj. Furl.

[4] *i.e.* (reading σκολόπακα) for the bird to find worms in with its long beak (Sch.). It is hard to say, without illus-

exceedingly fine, generally the spring is cold: if the spring is late and cold, the summer goes on late and the[1] autumn is usually scorching hot.

When the kermes-oak[2] fruits exceedingly well, it generally indicates a severe winter, and sometimes they say that this sign is followed by droughts. If one takes a mole[3] and puts it in a tub, the bottom[4] of which has been covered with clay, it indicates by the sounds which it utters wind or fine weather. There is also the sign of storm which is popularly recognized everywhere, namely when mice fight for the possession of chaff and carry it about.

The signs of fair weather.

IV. The following are signs of fair weather. [5]If the sun rises brilliant but without scorching heat and without showing any special sign in his orb, it indicates fair weather. The same may be said of the moon when it is full. If in winter that part of the sky into which the sun goes down is clear, it is a sign of fair weather, unless on the preceding days that part has not been clear, though it was clear above the horizon: in that case the prospect is uncertain. It is also a sign of fair weather, if during stormy conditions that part of the sky into which the sun sets is clear; and also if, in winter at the time of setting, the sun has a pale colour.

Again, it indicates fair weather if the outline of the moon on the third day is bright; also if the 'Ass's[6] Manger' is clear and bright. If the halo[7] forms and disappears evenly, it is a sign of fair

tration, which is the more convincing of the creatures suggested. [5] Plin. 18. 342. [6] *cf.* 23, 43.
[7] *cf.* 22, 31; Plin. 18. 345; Arist. *Meteor.* 3. 3.

παγῇ καὶ μαρανθῇ, εὐδίαν σημαίνει. αἱ κηλάδες[1] νεφέλαι χειμῶνος εὐδιειναί. Ὄλυμπος δὲ καὶ Ἄθως καὶ ὅλως τὰ ὄρη τὰ σημαντικὰ ὅταν τὰς κορυφὰς καθαρὰς ἔχωσιν, εὐδίαν σημαίνει. καὶ ὅταν τὰ νέφη πρὸς τὴν θάλασσαν αὐτὴν παραζωννύῃ, εὐδιεινόν. καὶ ὅταν ὕσαντος πρὸς δυσμὰς χαλκῶδες τὰ νέφη χρῶμα ἔχῃ· εὐδία γὰρ ὡς τὰ πολλὰ τῇ ὑστεραίᾳ.

52 Ὅταν δὲ ὁμίχλη γένηται, ὕδωρ οὐ γίνεται ἢ ἔλαττον. ὅταν γέρανοι πέτωνται καὶ μὴ ἀνακάμπτωσιν, εὐδίαν σημαίνει· οὐ γὰρ πέτονται πρὶν ἢ ἂν πετόμενοι καθαρὰ ἴδωσι. γλαῦξ ἡσυχαῖον φθεγγομένη ἐν χειμῶνι εὐδίαν προσημαίνει· καὶ νύκτωρ χειμῶνος ἡσυχαῖον ᾄδουσα. θαλαττία δὲ γλαῦξ ᾄδουσα χειμῶνος μὲν εὐδίαν σημαίνει, εὐδίας δὲ χειμῶνα. καὶ κόραξ δὲ μόνος μὲν ἡσυχαῖον κράζων, καὶ ἐὰν τρὶς κράξῃ μετὰ τοῦτο πολλάκις κράξῃ, εὐδιεινός. . . .

53 Καὶ κορώνη ἔωθεν εὐθὺς ἐὰν κράξῃ τρίς, εὐδίαν σημαίνει, καὶ ἑσπέρας χειμῶνος ἡσυχαῖον ᾄδουσα. καὶ ὄρχιλος ἐξ ὀπῆς ἐκπετόμενος καὶ ἐξ ἑρκίων καὶ ἐξ οἰκίας ἔξωθεν εὐδίαν σημαίνει. καὶ ἐὰν χειμῶνος βορεύοντος βορρᾶθεν ὑπόλαμψις γένηται λευκή, νοτόθεν δὲ ἐναντία τεταγμένη ἢ νεφέλη ὀγκώδης, ὡς ἐπὶ τὸ πολὺ εἰς εὐδίαν σημαίνει μεταβολήν. καὶ ὅταν βορέας νεφέλας πολλὰς κινῇ ἐκπνέων μέγας, εὐδίαν σημαίνει.

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[1] κηλάδες I conj. *cf.* 31, to which this statement answers. κοιλάδες MSS.

[2] Plin. 18. 356. [3] Plin. 18. 357. *cf.* Verg. *Georg.* 1. 401.

[4] Plin. 18. 362.

[5] ἐν χειμῶνι. ? 'in winter.' The same ambiguity occurs in many places : the sense seems fixed here by the next sentence.

weather. Light[1] clouds in winter are a sign of fine weather. It is a sign of fine weather when Olympus Athos and in general the mountains which give signs have their tops[2] clear: so too is it, when clouds encompass them at the sea-level.[3] Also when after rain the clouds have a bronze colour towards sundown: in that case there will generally be fine weather the next day.

When there is mist, little or no rain follows. When cranes[4] take flight and do not come back, it is a sign of fair weather: for they do not do so till they see a clear sky before them as they fly. It is a sign of fair weather when during a storm[5] an owl makes a low hoot, or at night during a storm it utters a low sound. If the sea-owl utters its note during a storm, it indicates fair weather, if during fair weather, it indicates a storm. It is a sign of fair weather if a solitary raven makes a low croak, and, after croaking three times, repeats the sound again and again. . . .[6]

If the crow caws thrice directly the dawn appears, it indicates fair weather, as also if it makes a low note in the evening during a storm. It is a sign of fair weather if a goldcrest flies out abroad from a hole or from a hedge or from its nest. Again, if during a storm from the north there is a white gleam from that quarter, while in the south a solid mass of cloud has formed, it generally signifies a change to fair weather. Again when the north wind (Boreas) as it begins to blow violently stirs up a number of clouds, it indicates fair weather.

[6] I have marked a lacuna: the answer to μὲν is missing, presumably a statement about the significance of *more than one* raven. *cf.* Verg. *Georg.* 1. 410.

54 Πρόβατα ὀψὲ ὀχευόμενα εὐδιεινὸν ἀποτελοῦσι τὸ σημεῖον. καὶ βοῦς ἐπὶ τὸ ἀρίστερον ἰσχίον κατακλινόμενος εὐδίαν σημαίνει· καὶ κύων ὡσαύτως· ἐπὶ δεξιὸν δὲ χειμῶνα. τέττιγες πολλοὶ γινόμενοι νοσώδες τὸ ἔτος σημαίνουσι. λύχνος χειμῶνος καιόμενος ἡσυχαῖος εὐδίαν σημαίνει. καὶ ἐὰν ἐπ' ἄκρῳ οἷον κέγχρους ἔχῃ λαμπράς· καὶ ἐὰν ἐν κύκλῳ τὴν μύξαν περιγράφῃ λαμπρὰ γραμμή.

55 Ὁ τῆς σχίνου καρπὸς σημαίνει τοὺς ἀρότους· ἔχει δὲ τρία μέρη καὶ ἔστιν ὁ πρῶτος τοῦ πρώτου ἀρότου σημεῖον, ὁ δεύτερος τοῦ δευτέρου, ὁ τρίτος τοῦ τρίτου· καὶ ὡς ἂν τούτων ἐκβαίνῃ κάλλιστα καὶ γένηται ἀδρότατος, οὕτως ἕξει καὶ ὁ κατὰ τοῦτον ἄροτος.

56 Λέγεται δὲ καὶ τοιάδε σημεῖα ὅλων τε τῶν ἐνιαυτῶν γίνεσθαι καὶ τῶν μορίων. ἐὰν ἀρχομένου τοῦ χειμῶνος ζόφος ᾖ καὶ καύματα γίνηται καὶ ταῦτα ἄνευ ὕδατος ὑπ' ἀνέμων διαλυθῇ, πρὸς τὸ ἔαρ σημαίνει χάλαζαν ἐσομένην. καὶ ἐὰν μετὰ τὴν ἐαρινὴν ἰσημερίαν ὁμίχλαι πίπτωσι, πνεύματα καὶ ἀνέμους σημαίνουσιν εἰς ἕβδομον μῆνα ἀμφοτέρων ἀριθμουμένων. ὅσαι μὲν ἅμα μηνοειδεῖ τῇ σελήνῃ πίπτουσιν, αὗται μὲν πνεύματα σημαίνουσιν εἰς ἐκεῖνον τὸν χρόνον, ὅσαι δ' ἀμφικύρτου οὔσης τῆς σελήνης ὕδατα. καὶ ὅσῳ

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[1] *cf.* 41. [2] *cf.* 14, 25, 42.
[3] *H.P.* 7. 13. 6 the same is said of *σκίλλα*.

When sheep begin to breed late, it is a sign which fulfils itself in fair weather. So is it when an ox lies[1] on his left side, and also when a dog does the same: if they lie on the right side, it indicates storm. The appearance of a number of cicadas indicates that the season will be unhealthy. If a lamp burns quietly during a storm, it indicates fair weather. So also if it has on the surface an appearance like shining millet-seeds:[2] also if a bright line surrounds the lamp-nozzle.

The fruiting of the mastich[3] gives signs as to the seasons of sowing:[4] it takes place at three several periods, which indicate respectively the time for the first the second and the third sowing: and according as one or other of these fruiting-times turns out[5] best and produces the most abundant fruit, so too will be the success of the corresponding time of sowing.

Miscellaneous signs.

The following signs are said to affect either the whole year or whole periods[6] of it. If at the beginning of winter there is dull weather followed by heat, and these conditions are dispersed by wind without rain, it indicates that towards the spring there will be hail. Again, if after the spring equinox mists come down, it is an indication of breezes and winds by the seventh month, reckoning inclusively. Those mists which come down when the moon is in its first quarter indicate breezes for that period, those which come down when the moon is in its third quarter indicate rain. And the more mists

[4] *cf. H.P.* 7. 1. 1 foll.
[5] ἐκβαίνῃ I conj.: *cf. H.P.* 7. 13. 6; κλίνῃ MSS.
[6] *cf.* 6.

ἂν μᾶλλον ἐφ' ἑκατέρῳ τῷ σχήματι ὁμίχλαι πίπτωσι, μᾶλλον τὰ εἰρημένα σημαίνει.

57 Σημαίνει δὲ καὶ τὰ πνεύματα ἅμα ταῖς ὁμίχλαις ἐπιπιπτούσαις γινόμενα· καὶ ἐὰν μὲν ἀπ' ἠοῦς καὶ μεσημβρίας γίνηται τὰ πνεύματα, ὕδατα σημαίνει· ἐὰν δ' ἀφ' ἑσπέρας καὶ ἀπὸ τῆς ἄρκτου πνεύματα καὶ ψύχη. οὓς δὲ κομήτας Αἰγύπτιοι λέγουσιν οὐ μόνον τὰ προειρημένα σημαίνουσιν ὅταν φαίνωνται ἀλλὰ καὶ ψύχη· ἐπὶ δὲ τοῖς ἄστροις εἴωθεν ὡς ἐπὶ τὸ πολὺ σημαίνειν καὶ ταῖς ἰσημερίαις καὶ τροπαῖς, οὐκ ἐπ' αὐταῖς ἀλλ' ἢ πρὸ αὐτῶν ἢ ὕστερον μικρῷ.

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[1] *cf.* 34; Arist. *Meteor.* 1. 6.

[2] Text seems doubtful, as cold weather was included above.

come down when the moon is assuming either shape, the more certainly is the result just mentioned indicated.

Also the winds which accompany the falling of the mists are significant: if the breezes come from the east or south, rain is indicated; if from the west or north, breezes and cold weather. And the stars which the Egyptians[1] call 'comets' indicate not only the conditions just mentioned but also cold[2] weather. [3] In the case of the rising of the stars the indication, as in the case also of the equinoxes and solstices, is given not at the actual time but a little earlier or later.

[2] The text of this sentence can hardly be sound. σημαίνει has no subject and καὶ ἰσημερίας καὶ τροπὰς no construction.