

ΑΝΑΛΥΤΙΚΩΝ ΠΡΟΤΕΡΩΝ

Α

24 a 10 I. Πρῶτον εἰπεῖν περὶ τί καὶ τίνος ἐστὶν ἡ σκέψις, ὅτι περὶ ἀπόδειξιν καὶ ἐπιστήμης ἀποδεικτικῆς· εἶτα διορίσαι τί ἐστὶ πρότασις καὶ τί ὅρος καὶ τί συλλογισμός, καὶ ποῖος τέλειος καὶ ποῖος ἀτελής, μετὰ δὲ ταῦτα τί τὸ ἐν ὅλῳ εἶναι ἢ μὴ εἶναι τόδε 15 τῷδε, καὶ τί λέγομεν τὸ κατὰ παντός ἢ μηδενὸς κατηγορεῖσθαι.

Πρότασις μὲν οὖν ἐστὶ λόγος καταφατικός ἢ ἀποφατικός τινὸς κατὰ τινος· οὗτος δὲ ἢ καθόλου ἢ ἐν μέρει ἢ ἀδιόριστος. λέγω δὲ καθόλου μὲν τὸ παντὶ ἢ μηδενὶ ὑπάρχειν, ἐν μέρει δὲ τὸ τινὶ ἢ μὴ 20 τινὶ ἢ μὴ παντὶ ὑπάρχειν, ἀδιόριστον δὲ τὸ ὑπάρχειν ἢ μὴ ὑπάρχειν ἄνευ τοῦ καθόλου ἢ κατὰ μέρος, οἷον τὸ τῶν ἐναντίων εἶναι τὴν αὐτὴν ἐπιστήμην ἢ τὸ τὴν ἡδονὴν μὴ εἶναι ἀγαθόν.

Διαφέρει δὲ ἡ ἀποδεικτικὴ πρότασις τῆς διαλεκτικῆς, ὅτι ἡ μὲν ἀποδεικτικὴ λήψις θατέρου μορίου τῆς ἀντιφάσεώς ἐστὶν (οὐ γὰρ ἐρωτᾷ ἀλλὰ

PRIOR ANALYTICS

BOOK I

I. OUR first duty is to state the scope of our inquiry, and to what science it pertains : that it is concerned with demonstration, and pertains to a demonstrative science. Next we must define the meaning of 'premiss' and 'term' and 'syllogism,' and distinguish between a perfect and an imperfect syllogism ; and after this we must explain in what sense one term is said to be or not to be 'wholly contained' in another ; and what we mean by 'predicated of all' or 'of none.'

BOOK I.
THE LAWS
OF
SYLLOGISM.
Scope of the
treatise.

A premiss is an affirmative or negative statement of something about some subject. This statement may be universal or particular or indefinite. By universal I mean a statement which applies to all, or to none, of the subject ; by particular, a statement which applies to some of the subject, or does not apply to some, or does not apply to all ; by indefinite, a statement which applies or does not apply without reference to universality or particularity, *e.g.*, 'contraries are studied by the same science' or 'pleasure is not good.'

Preliminary
definition
of the
premiss, and
its types.

The premiss of demonstration differs from the premiss of dialectic in that the former is the assumption of one member of a pair of contradictory statements (since the demonstrator does not ask a question

Demonstrative, dialectical and syllogistic premisses.

24 a

25 λαμβάνει ὁ ἀποδεικνύων), ἡ δὲ διαλεκτικὴ ἐρώτησις ἀντιφάσεώς ἐστιν. οὐδὲν δὲ διοίσει πρὸς τὸ γενέσθαι τὸν ἑκατέρου συλλογισμόν· καὶ γὰρ ὁ ἀποδεικνύων καὶ ὁ ἐρωτῶν συλλογίζεται λαβὼν τι κατὰ τινος ὑπάρχειν ἢ μὴ ὑπάρχειν. ὥστε ἔσται συλλογιστικὴ μὲν πρότασις ἀπλῶς κατάφασις ἢ

80 ἀπόφασις τινος κατὰ τινος τὸν εἰρημένον τρόπον, ἀποδεικτικὴ δὲ εἰάν ἀληθὴς ἢ καὶ διὰ τῶν ἐξ ἀρχῆς

24 b

10 ὑποθέσεων εἰλημμένη, διαλεκτικὴ δὲ πυνθανομένων μὲν ἐρώτησις ἀντιφάσεως, συλλογιζομένων δὲ λήψεως τοῦ φαινομένου καὶ ἐνδόξου, καθάπερ ἐν τοῖς Τοπικοῖς εἴρηται.

Τί μὲν οὖν ἐστὶ πρότασις, καὶ τί διαφέρει συλλογιστικὴ καὶ ἀποδεικτικὴ καὶ διαλεκτικὴ, δι' 15 ἀκριβείας μὲν ἐν τοῖς ἐπομένοις ῥηθήσεται, πρὸς δὲ τὴν παροῦσαν χρεῖαν ἱκανῶς ἡμῖν διωρίσθω τὰ νῦν.

Ὅρον δὲ καλῶ εἰς ὃν διαλύεται ἡ πρότασις, οἷον τό τε κατηγορούμενον καὶ τὸ καθ' οὗ κατηγορεῖται, ἢ προστιθεμένου ἢ διαιρουμένου τοῦ εἶναι καὶ μὴ εἶναι.

Συλλογισμὸς δὲ ἐστὶ λόγος ἐν ᾧ τεθέντων τινῶν 20 ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει τῷ ταῦτα εἶναι. λέγω δὲ τῷ ταῦτα εἶναι τὸ διὰ ταῦτα

^a i.e. that which is either self-evident or accepted as true for the immediate inquiry. Cf. *An. Post.* I. ix.; *Topics*, 100 a 27.

^b A dialectical premiss may be either the alternative chosen by an actual opponent in answer to a question of the form 'Is X Y or not Y?' or the assumption of one alternative by a person reasoning independently.

but makes an assumption), whereas the latter is an answer to the question which of two contradictory statements is to be accepted. This difference, however, will not affect the fact that in either case a syllogism results ; for both the demonstrator and the interrogator draw a syllogistic conclusion by first assuming that some predicate applies or does not apply to some subject. Thus a syllogistic premiss will be simply the affirmation or negation of some predicate of some subject, in the way already described ; the premiss will be demonstrative if it is true and based upon fundamental postulates ^a ; while the dialectical premiss will be, for the interrogator, an answer to the question which of two contradictory statements is to be accepted, and for the logical reasoner,^b an assumption of what is apparently true and generally accepted,—as has been stated in the *Topics*.^c

What is meant by a premiss, and what difference there is between syllogistic, demonstrative and dialectical premisses, will be explained with exactness later ^d ; but for our immediate requirements the present definition may be taken as sufficient.

By a term I mean that into which the premiss Term defined. can be analysed, viz., the predicate and the subject, with the addition or removal of the verb to be or not to be.

A syllogism is a form of words in which, when Syllogism defined. certain assumptions are made, something other than what has been assumed necessarily follows from the fact that the assumptions are such. By ' from the fact that they are such ' I mean that it is because

^c 104 a 8 ; cf. also 100 a 29.

^d Demonstrative in *An. Post.* I. vi.-ix. ; dialectical in *Topics*.

24 b

συμβαίνειν, τὸ δὲ διὰ ταῦτα συμβαίνειν τὸ μηδενὸς
ἔξωθεν ὄρου προσδεῖν πρὸς τὸ γενέσθαι τὸ ἀναγ-
καῖον.

Τέλειον μὲν οὖν καλῶ συλλογισμὸν τὸν μηδενὸς
ἄλλου προσδεόμενον παρὰ τὰ εἰλημμένα πρὸς τὸ
25 φανῆναι τὸ ἀναγκαῖον, ἀτελῇ δὲ τὸν προσδεόμενον
ἢ ἐνὸς ἢ πλειόνων, ἃ ἔστι μὲν ἀναγκαῖα διὰ τῶν
ὑποκειμένων ὄρων, οὐ μὴν εἴληπται διὰ προτάσεων.

Τὸ δὲ ἐν ὅλῳ εἶναι ἕτερον ἐτέρῳ καὶ τὸ κατὰ
παντὸς κατηγορεῖσθαι θατέρου θάτερον ταυτόν
ἐστίν. λέγομεν δὲ τὸ κατὰ παντὸς κατηγορεῖσθαι
30 ὅταν μηδὲν ἢ λαβεῖν τῶν τοῦ ὑποκειμένου καθ'
οὐ θάτερον οὐ λεχθήσεται· καὶ τὸ κατὰ μηδενὸς
ὡσαύτως.

25 a

II. Ἐπεὶ δὲ πᾶσα πρότασις ἐστίν ἢ τοῦ ὑπάρχειν
ἢ τοῦ ἐξ ἀνάγκης ὑπάρχειν ἢ τοῦ ἐνδέχεσθαι
ὑπάρχειν, τούτων δὲ αἱ μὲν καταφατικαὶ αἱ δὲ
ἀποφατικαὶ καθ' ἐκάστην πρόσρῃσιν, πάλιν δὲ τῶν
5 καταφατικῶν καὶ ἀποφατικῶν αἱ μὲν καθόλου αἱ
δὲ ἐν μέρει αἱ δὲ ἀδιόριστοι, τὴν μὲν ἐν τῷ ὑπ-
άρχειν καθόλου στερητικὴν ἀνάγκη τοῖς ὅροις ἀντι-
στρέφειν, οἷον εἰ μηδεμία ἡδονὴ ἀγαθόν, οὐδ'
ἀγαθὸν οὐδὲν ἔσται ἡδονή· τὴν δὲ κατηγορικὴν ἀντι-
στρέφειν μὲν ἀναγκαῖον, οὐ μὴν καθόλου ἀλλ'
ἐν μέρει, οἷον εἰ πᾶσα ἡδονὴ ἀγαθόν, καὶ ἀγαθόν
10 τι εἶναι ἡδονήν· τῶν δὲ ἐν μέρει τὴν μὲν κατα-
φατικὴν ἀντιστρέφειν ἀνάγκη κατὰ μέρος (εἰ γὰρ
ἡδονή τις ἀγαθόν, καὶ ἀγαθόν τι ἔσται ἡδονή), τὴν
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of them that the conclusion follows ; and by this I mean that there is no need of any further term to render the conclusion necessary.

I call a syllogism perfect if it requires nothing, apart from what is comprised in it, to make the necessary conclusion apparent ; imperfect if it requires one or more propositions which, although they necessarily follow from the terms which have been laid down, are not comprised in the premisses.

Perfect and imperfect syllogisms.

For one term to be wholly contained in another is the same as for the latter to be predicated of all of the former. We say that one term is predicated of all of another when no examples of the subject can be found of which the other term cannot be asserted. In the same way we say that one term is predicated of none of another.

'To be wholly contained in and 'to be predicated of all.'

II. Now every premiss is of the form that some attribute applies, or necessarily applies, or may possibly apply, to some subject.^a These three types are divided into affirmative and negative in accordance with each mode of attribution ; and again of affirmative and negative premisses some are universal, others particular and others indefinite. In universal statement the negative premiss is necessarily convertible in its terms : *e.g.*, if no pleasure is good, neither will anything good be pleasure ; but the affirmative, though necessarily convertible, is so not as a universal but as a particular statement : *e.g.*, if every pleasure is good, some good must also be pleasure. In particular statements the affirmative premiss must be convertible as particular, for if some pleasure is good, some good will also be pleasure ; but the

Premises are (1) assertoric, apodeictic or problematic ; (2) affirmative or negative ; (3) universal, particular or indefinite. Rules for the conversion of (a) assertoric,

^a This modal analysis is rejected by many modern logicians. Cf. *Intro.* pp. 189-193.

25^a δὲ στερητικὴν οὐκ ἀναγκαῖον· οὐ γὰρ εἰ ἄνθρωπος μὴ ὑπάρχει τινὶ ζῳῷ, καὶ ζῶον οὐχ ὑπάρχει τινὶ ἀνθρώπῳ.

Πρῶτον μὲν οὖν ἔστω στερητικὴ καθόλου ἡ
 15 AB πρότασις. εἰ οὖν μηδενὶ τῶν¹ B τὸ A ὑπάρχει, οὐδὲ τῶν A οὐδενὶ ὑπάρξει τὸ B. εἰ γὰρ τι, ὅλον τῷ Γ, οὐκ ἀληθὲς ἔσται τὸ μηδενὶ τῶν B τὸ A ὑπάρχειν· τὸ γὰρ Γ τῶν B τί ἐστίν. εἰ δὲ παντὶ τὸ A τῷ B, καὶ τὸ B τινὶ τῷ A ὑπάρχει. εἰ γὰρ μηδενί, οὐδὲ τὸ A οὐδενὶ τῷ B ὑπάρξει· ἀλλ'
 20 ὑπέκειτο παντὶ ὑπάρχειν. ὁμοίως δὲ καὶ εἰ κατὰ μέρος ἐστὶν ἡ πρότασις. εἰ γὰρ τὸ A τινὶ τῶν B, καὶ τὸ B τινὶ τῶν A ἀνάγκη ὑπάρχειν· εἰ γὰρ μηδενί, οὐδὲ τὸ A οὐδενὶ τῶν B.² εἰ δέ γε τὸ A τινὶ τῶν B μὴ ὑπάρχει, οὐκ ἀνάγκη καὶ τὸ B τινὶ τῷ A μὴ ὑπάρχειν, ὅλον εἰ τὸ μὲν B ἐστὶ
 25 ζῶον τὸ δὲ A ἄνθρωπος· ἄνθρωπος μὲν γὰρ οὐ παντὶ ζῳῷ, ζῶον δὲ παντὶ ἀνθρώπῳ ὑπάρχει.

III. Τὸν αὐτὸν δὲ τρόπον ἔξει καὶ ἐπὶ τῶν ἀναγκαίων προτάσεων· ἡ μὲν γὰρ καθόλου στερητικὴ καθόλου ἀντιστρέφει, τῶν δὲ καταφατικῶν ἑκάτερα
 30 κατὰ μέρος. εἰ μὲν γὰρ ἀνάγκη τὸ A τῷ B μηδενὶ ὑπάρχειν, ἀνάγκη καὶ τὸ B τῷ A μηδενὶ ὑπάρχειν· εἰ γὰρ τινὶ ἐνδέχεται, καὶ τὸ A τῷ B τινὶ ἐνδέχοιτο ἄν. εἰ δὲ ἐξ ἀνάγκης τὸ A παντὶ ἢ τινὶ τῷ B ὑπάρχει, καὶ τὸ B τινὶ τῷ A ἀνάγκη ὑπάρχειν· εἰ γὰρ μὴ ἀνάγκη, οὐδ' ἂν τὸ A τινὶ τῶν B ἐξ
 35 ἀνάγκης ὑπάρχοι. τὸ δ' ἐν μέρει στερητικὸν οὐκ ἀντιστρέφει διὰ τὴν αὐτὴν αἰτίαν δι' ἣν καὶ πρότερον ἔφαμεν.

¹ τῷ C¹, Bekker.

² τῶν B ὑπάρξει codd. dett.

negative is not necessarily convertible ; for it does not follow that if 'man' does not apply to some animal, neither will 'animal' apply to some man.

First, then, let us take a negative universal premiss^a having the terms A and B. Then if A applies to no B,^b neither will B apply to any A ; for if it applies to some, *e.g.* C, it will not be true that A applies to no B, because C is a B. If on the other hand A applies to all B, B also applies to some A ; for if it applies to none, neither will A apply to any B ; but *ex hypothesi* it applies to all B. Similarly too if the premiss is particular. For if A applies to some B, B must also apply to some A ; since if it applies to none, neither will A apply to any B. But if A does not apply to some B, it does not necessarily follow that B does not apply to some A ; *e.g.*, if B is 'animal' and A 'man' ; for 'man' does not apply to every animal, but 'animal' applies to every man.

III. The same principle will also obtain in the case^(b) of apodeictic premisses. The universal negative converts universally, whereas each of the affirmatives converts as a particular premiss. For if A necessarily applies to no B, B also necessarily applies to no A ; for if it may apply to some, A might also apply to some B. But if A necessarily applies to all or some of B, B must also apply to some A ; for if this is not necessarily so, neither will A necessarily apply to some B. The particular negative statement is not convertible, for the same reason which we have already stated.^c

^a *Sc.* of the assertoric type.

^b It must be noted that in the Aristotelian formula the predicate regularly comes before the subject. The modern equivalent is 'No B is A.'

^c Ch. ii. *ad fin.*

25 a

Ἐπὶ δὲ τῶν ἐνδεχομένων, ἐπειδὴ πολλαχῶς
λέγεται τὸ ἐνδέχεσθαι (καὶ γὰρ τὸ ἀναγκαῖον
καὶ τὸ μὴ ἀναγκαῖον καὶ τὸ δυνατόν ἐνδέχεσθαι
40 λέγομεν), ἐν μὲν τοῖς καταφατικοῖς ὁμοίως ἔξει
κατὰ τὴν ἀντιστροφὴν ἐν ᾗ ἅπασιν· εἰ γὰρ τὸ Α
25 b παντὶ ἢ τινὶ τῷ Β ἐνδέχεται, καὶ τὸ Β τινὶ τῷ Α
ἐνδέχοιτο ἂν (εἰ γὰρ μηδενί, οὐδ' ἂν τὸ Α οὐδενὶ
τῷ Β· δέδεικται γὰρ τοῦτο πρότερον)· ἐν δὲ τοῖς
ἀποφατικοῖς οὐχ ὡσαύτως, ἀλλ' ὅσα μὲν ἐνδέχε-
5 σθαι λέγεται ἢ τῷ ἐξ ἀνάγκης ὑπάρχειν¹ ἢ τῷ μὴ
ἐξ ἀνάγκης ὑπάρχειν, ὁμοίως· οἷον εἰ τις φαίη τὸν
ἄνθρωπον ἐνδέχεσθαι μὴ εἶναι ἵππον ἢ τὸ λευκὸν
μηδενὶ ἱματίῳ ὑπάρχειν· τούτων γὰρ τὸ μὲν ἐξ
ἀνάγκης οὐχ ὑπάρχει, τὸ δὲ οὐκ ἀνάγκη ὑπάρχειν,
καὶ ὁμοίως ἀντιστρέφει ἡ πρότασις· εἰ γὰρ ἐν-
10 δέχεται μηδενὶ ἀνθρώπῳ ἵππον, καὶ ἀνθρώπον
ἐγχωρεῖ μηδενὶ ἵππῳ· καὶ εἰ τὸ λευκὸν ἐγχωρεῖ
μηδενὶ ἱματίῳ, καὶ τὸ ἱμάτιον ἐγχωρεῖ μηδενὶ
λευκῷ· εἰ γὰρ τινὶ ἀνάγκη, καὶ τὸ λευκὸν ἱματίῳ
τινὶ ἔσται ἐξ ἀνάγκης· τοῦτο γὰρ δέδεικται πρό-
τερον· ὁμοίως δὲ καὶ ἐπὶ τῆς ἐν μέρει ἀποφατικῆς·
ὅσα δὲ τῷ ὡς ἐπὶ πολὺ καὶ τῷ πεφυκέναι λέγεται
15 ἐνδέχεσθαι, καθ' ὃν τρόπον διορίζομεν τὸ ἐνδεχό-
μενον, οὐχ ὁμοίως ἔξει ἐν ταῖς στερητικαῖς ἀντι-
στροφαῖς, ἀλλ' ἢ μὲν καθόλου στερητικὴ πρότασις

¹ ὑπάρχειν AB (μὴ supra lineam praefixo) Phil., Waitz:
μὴ ὑπάρχειν recce.

* This is obviously a loose application of the term, and one which Aristotle does not always admit: cf. 32 a 18-21 and *De Interp.* 22 a 16. For a discussion of his treatment of problematic syllogism see *Introd.* pp. 190-192.

With regard to possible premisses, since the term (c) problem-
 'possible' is used in several senses (for we call ^{atic}
 possible both that which is necessary ^a and that which
 is not necessary and that which is capable of being),
 in all affirmative statements conversion will take place
 under the same conditions as before. For if A may
 apply to all or some of B, B might also apply to some
 A; for if it could apply to none, neither could A
 apply to any B. This has been proved above.^b But
 in negative statements the case is not the same. In
 all examples which are said to be possible in the
 sense that the statement is necessarily true, or is not
 necessarily true, the conditions are similar to those
 already stated; *e.g.*, if it were said to be possible
 that a man should not be a horse, or that 'white'
 should apply to no coat. For in the former example
 the predicate necessarily does not apply to the sub-
 ject, and in the latter it does not necessarily apply;
 and the premiss converts like other negatives. For
 if it is possible for 'horse' to apply to no man, it is
 also possible for 'man' to apply to no horse; and
 if it is possible for 'white' to apply to no coat,
 it is also possible for 'coat' to apply to nothing
 white. For if it must apply to something that is
 white, 'white' will also necessarily apply to some
 coat; this has been proved above.^c Similar con-
 ditions govern the conversion of particular negative
 premisses.

But in such premisses as are said to be possible in
 the sense that they are generally or naturally true
 (for we define the possible in this way), the conditions
 for the conversion of negatives will not be the same
 as before. The universal negative premiss does not

^b 25 a 18 ff.

^c 25 a 32.

25 b

οὐκ ἀντιστρέφει, ἢ δὲ ἐν μέρει ἀντιστρέφει. τοῦτο δὲ ἔσται φανερόν ὅταν περὶ τοῦ ἐνδεχομένου λέγωμεν.

Νῦν δὲ τοσοῦτον ἡμῖν ἔστω πρὸς τοῖς εἰρημένοις
 20 δῆλον, ὅτι τὸ ἐνδέχεσθαι μηδενὶ ἢ τινὶ μὴ ὑπάρχειν
 καταφατικὸν ἔχει τὸ σχῆμα· τὸ γὰρ ἐνδέχεται τῷ
 ἔστιν ὁμοίως τάττεται, τὸ δὲ ἔστιν, οἷς ἂν προσ-
 κατηγορηῖται, κατάφασιν αἰεὶ ποιεῖ καὶ πάντως,
 ὅλον τὸ ἔστιν οὐκ ἀγαθόν ἢ ἔστιν οὐ λευκόν ἢ
 ἀπλῶς τὸ ἔστιν οὐ τοῦτο. δειχθήσεται δὲ καὶ τοῦτο
 25 διὰ τῶν ἐπομένων. κατὰ δὲ τὰς ἀντιστροφὰς
 ὁμοίως ἔξουσιν ταῖς ἄλλαις.

IV. Διωρισμένων δὲ τούτων λέγομεν ἤδη διὰ
 τίνων καὶ πότε καὶ πῶς γίνεταί πᾶς συλλο-
 γισμός· ὕστερον δὲ λεκτέον περὶ ἀποδείξεως.
 πρότερον δὲ περὶ συλλογισμοῦ λεκτέον ἢ περὶ
 ἀποδείξεως διὰ τὸ καθόλου μᾶλλον εἶναι τὸν
 30 συλλογισμόν· ἢ μὲν γὰρ ἀπόδειξις συλλογισμός τις,
 ὁ συλλογισμός δὲ οὐ πᾶς ἀπόδειξις.

Ὅταν οὖν ὅροι τρεῖς οὕτως ἔχωσι πρὸς ἀλλήλους
 ὥστε τὸν ἔσχατον ἐν ὅλῳ εἶναι τῷ μέσῳ καὶ τὸν
 μέσον ἐν ὅλῳ τῷ πρώτῳ ἢ εἶναι ἢ μὴ εἶναι,
 35 ἀνάγκη τῶν ἄκρων εἶναι συλλογισμόν τέλειον.
 καλῶ δὲ μέσον μὲν ὁ καὶ αὐτὸ ἐν ἄλλῳ καὶ
 ἄλλο ἐν τούτῳ ἐστίν, ὁ καὶ τῇ θέσει γίνεταί μέσον·
 ἄκρα δὲ τὸ αὐτὸ τε ἐν ἄλλῳ ὄν καὶ ἐν ᾧ ἄλλο
 ἐστίν. εἰ γὰρ τὸ Α κατὰ παντὸς τοῦ Β καὶ τὸ
 Β κατὰ παντὸς τοῦ Γ, ἀνάγκη τὸ Α κατὰ παντὸς
 τοῦ Γ κατηγορεῖσθαι πρότερον γὰρ εἴρηται πῶς

• Chs. xiii. ff.

• Ch. xlv.

• In the *Posterior Analytics*.

• 24 b 28.

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convert, whereas the particular negative does. This will become clear when we discuss the possible.^a

For the present we may regard this much as clear, in addition to what we have already said : that the statement 'it is possible for A to apply to no B' or 'not to apply to some B' is affirmative in form ; for the expression 'is possible' corresponds to 'is,' and the word 'is,' to whatever terms it is attached in predication, has always and without exception the effect of affirmation : *e.g.*, 'is not good' or 'is not white' or in general 'is not X.' This also will be proved later.^b In respect of conversion these premisses will be governed by the same conditions as other affirmatives.

IV. Having drawn these distinctions we can now state by what means, and when, and how every syllogism is effected. Afterwards we must deal with demonstration.^c The reason why we must deal with the syllogism before we deal with demonstration is that the syllogism is more universal ; for demonstration is a kind of syllogism, but not every syllogism is a demonstration.

When three terms are so related to one another that the last is wholly contained in the middle and the middle is wholly contained in or excluded from the first, the extremes must admit of perfect syllogism. By 'middle term' I mean that which both is contained in another and contains another in itself, and which is the middle by its position also ; and by 'extremes' (a) that which is contained in another, and (b) that in which another is contained. For if A is predicated of all B, and B of all C, A must necessarily be predicated of all C. We have already explained^d what we mean by saying that one term

Figures and moods of syllogism.

The First Figure.

Middle term.

Extreme terms.
(1) Both premisses universal.
Barbara.

25 b

40 τὸ κατὰ παντὸς λέγομεν. ὁμοίως δὲ καὶ εἰ τὸ
26 a μὲν A κατὰ μηδενὸς τοῦ B τὸ δὲ B κατὰ παντὸς
τοῦ Γ, ὅτι τὸ A οὐδενὶ τῷ Γ ὑπάρξει.

Εἰ δὲ τὸ μὲν πρῶτον παντὶ τῷ μέσῳ ὑπάρχει, τὸ
δὲ μέσον μηδενὶ τῷ ἐσχάτῳ ὑπάρχει, οὐκ ἔσται
συλλογισμὸς τῶν ἄκρων· οὐδὲν γὰρ ἀναγκαῖον
δ συμβαίνει τῷ ταῦτα εἶναι· καὶ γὰρ παντὶ καὶ
μηδενὶ ἐνδέχεται τὸ πρῶτον τῷ ἐσχάτῳ ὑπάρχειν,
ὥστε οὔτε τὸ κατὰ μέρος οὔτε τὸ καθόλου
γίγνεται ἀναγκαῖον· μηδενὸς δὲ ὄντος ἀναγκαίου
διὰ τούτων οὐκ ἔσται συλλογισμὸς. ὅροι τοῦ
παντὶ ὑπάρχειν ζῶον—ἄνθρωπος—ἵππος, τοῦ μη-
δενὶ ζῶον—ἄνθρωπος—λίθος.

10 Οὐδ' ὅταν μήτε τὸ πρῶτον τῷ μέσῳ μήτε τὸ
μέσον τῷ ἐσχάτῳ μηδενὶ ὑπάρχη, οὐδ' οὕτως ἔσται
συλλογισμὸς. ὅροι τοῦ ὑπάρχειν ἐπιστήμη—
γραμμα—ιατρική, τοῦ μὴ ὑπάρχειν ἐπιστήμη—
γραμμα—μονάς.

Καθόλου μὲν οὖν ὄντων τῶν ὄρων δῆλον ἐν
τούτῳ τῷ σχήματι πότε ἔσται καὶ πότε οὐκ ἔσται
15 συλλογισμὸς, καὶ ὅτι ὄντος τε συλλογισμοῦ τοὺς
ὄρους ἀναγκαῖον ἔχειν ὡς εἶπομεν, ἂν θ' οὕτως
ἔχωσιν, ὅτι ἔσται συλλογισμὸς.

Εἰ δ' ὁ μὲν καθόλου τῶν ὄρων ὁ δ' ἐν μέρει
πρὸς τὸν ἕτερον, ὅταν μὲν τὸ καθόλου τεθῇ πρὸς
τὸ μείζον ἄκρον ἢ κατηγορικὸν ἢ στερητικόν,
τὸ δὲ ἐν μέρει πρὸς τὸ ἔλαττον κατηγορικόν,
20 ἀνάγκη συλλογισμὸν εἶναι τέλειον, ὅταν δὲ πρὸς
τὸ ἔλαττον ἢ καὶ ἄλλως πως ἔχωσιν οἱ ὅροι,

is predicated of all of another. Similarly too if A Celarent. is predicated of none of B, and B of all of C, it follows that A will apply to no C.

If, however, the first term applies to all the middle, AE- and the middle to none of the last, the extremes cannot admit of syllogism ; for no conclusion follows necessarily from the fact that they are such, since it is possible for the first term to apply either to all or to none of the last, and so neither a particular nor a universal conclusion necessarily follows ; and if no necessary conclusion follows from the premisses there can be no syllogism. The positive relation of the extremes may be illustrated by the terms animal—man—horse ; the negative relation by animal—man—stone.

Again, when the first applies to none of the middle, EE- and the middle to none of the last, here too there can be no syllogism. The positive relation of the extremes may be illustrated by the terms science—line—medicine ; the negative relation by science—line—unit.

Thus if the terms are in a universal relation it is clear, so far as this figure is concerned, when there will be a syllogism and when there will not. It is clear also that if there is a syllogism the terms must be related as we have said ; and that if they are so related, there will be a syllogism.

If, however, one of the <extreme> terms is in a universal and the other in a particular relation to the remaining term, when the universal statement, whether affirmative or negative, refers to the major term, and the particular statement is affirmative and refers to the minor term, there must be a perfect syllogism ; but when the universal statement refers to the minor term, or the terms are related in any

(2) One universal and one particular premiss.

26 a

ἀδύνατον. λέγω δὲ μείζον μὲν ἄκρον ἐν ᾧ τὸ μέσον ἐστίν, ἔλαττον δὲ τὸ ὑπὸ τὸ μέσον ὄν. ὑπαρχέτω γὰρ τὸ μὲν Α παντὶ τῷ Β, τὸ δὲ Β τινὶ τῷ Γ. οὐκοῦν εἰ ἔστι παντὸς κατηγορεῖσθαι τὸ ἐν ἀρχῇ λεχθέν, ἀνάγκη τὸ Α τινὶ τῷ Γ ὑπάρχειν. καὶ εἰ τὸ μὲν Α μηδενὶ τῷ Β ὑπάρχει τὸ δὲ Β τινὶ τῷ Γ, ἀνάγκη τὸ Α τινὶ τῷ Γ μὴ ὑπάρχειν· ὥριστα γὰρ καὶ τὸ κατὰ μηδενὸς πῶς λέγομεν· ὥστε ἔσται συλλογισμὸς τέλειος. ὁμοίως δὲ καὶ εἰ ἀδιόριστον εἴη τὸ ΒΓ κατηγορικὸν ὄν· ὁ γὰρ αὐτὸς ἔσται συλλογισμὸς ἀδιόριστου τε καὶ ἐν μέρει ληφθέντος.

Ἐὰν δὲ πρὸς τὸ ἔλαττον ἄκρον τὸ καθόλου τεθῇ ἢ κατηγορικὸν ἢ στερητικόν, οὐκ ἔσται συλλογισμός, οὔτε καταφατικοῦ οὔτε ἀποφατικοῦ τοῦ ἀδιόριστου ἢ κατὰ μέρος ὄντος, οἷον εἰ τὸ μὲν Α τινὶ τῷ Β ὑπάρχει ἢ μὴ ὑπάρχει, τὸ δὲ Β παντὶ τῷ Γ ὑπάρχει· ὅροι τοῦ ὑπάρχειν ἀγαθόν—ἕξις—φρόνησις, τοῦ μὴ ὑπάρχειν ἀγαθόν—ἕξις—ἀμαθία.

Πάλιν εἰ τὸ μὲν Β μηδενὶ τῷ Γ, τὸ δὲ Α τινὶ τῷ Β ὑπάρχει ἢ μὴ ὑπάρχει ἢ μὴ παντὶ ὑπάρχει, οὐδ' οὕτως ἔσται συλλογισμός. ὅροι λευκόν—ἵππος—κύκνος, λευκόν—ἵππος—κόραξ. οἱ αὐτοὶ δὲ καὶ εἰ τὸ ΑΒ ἀδιόριστον.

26 b Οὐδ' ὅταν τὸ μὲν πρὸς τῷ μείζονι ἄκρῳ καθόλου γένηται ἢ κατηγορικὸν ἢ στερητικόν, τὸ δὲ πρὸς τῷ ἐλάττονι στερητικόν κατὰ μέρος, οὐκ ἔσται συλ-

¹ τοῦ f, Waitz: οὔτε.

* Aristotle's wording is a little unfortunate. He does not, of course, mean that the relation of the major to the middle or of the middle to the minor term is always that of genus to

other way, this is impossible. (By the major term Major and minor terms. I mean that in which the middle is contained, and by the minor that which falls under the middle term.^a)

For let A apply to all B, and B to some C. Then if Darii. 'to be predicated of all' means what we stated at the beginning,^b A must apply to some C. And if Ferio. A applies to no B, but B applies to some C, A must necessarily not apply to some C (we have also defined what we mean by 'to be predicated of none' ^c). Thus we shall have a perfect syllogism. Similarly too supposing the proposition BC to be indefinite, provided that it is affirmative; for we shall have the same syllogism whether BC is indefinite or particular.

If, however, the universal statement, whether IA-OA- affirmative or negative, refers to the minor term, there will be no syllogism, whether the indefinite (or particular) statement is affirmative or negative; *e.g.*, if A applies or does not apply to some B, and B applies to all C. The positive relation of the extremes may be illustrated by the terms good—state—intelligence; the negative relation by good—state—ignorance.

Again, if B applies to no C, and A applies to some, IE-OE- or does not apply to some or all of B; in this case too there will be no syllogism. We may take as terms white—horse—swan, white—horse—crow. The same terms will also serve if the proposition AB is indefinite.

Furthermore, when the statement relating to the major term is universal, whether affirmative or negative, and that relating to the minor is negative and particular, there will be no syllogism, whether the

species, but merely that the predicate is naturally a more comprehensive notion than the subject.

^b 24 b 28.

^c 24 b 30.

26 b

- λογισμὸς ἀδιόριστον τε καὶ ἐν μέρει ληφθέντος, οἶον εἰ τὸ μὲν Α παντὶ τῷ Β ὑπάρχει, τὸ δὲ Β
 5 τινὶ τῷ Γ μὴ, ἢ εἰ μὴ παντὶ ὑπάρχει· ὧ γὰρ ἂν τινι μὴ ὑπάρχῃ τὸ μέσον, τούτῳ καὶ παντὶ καὶ οὐδενὶ ἀκολουθήσει τὸ πρῶτον. ὑποκείσθωσαν γὰρ οἱ ὅροι ζῶον—ἄνθρωπος—λευκόν· εἰτα καὶ ὧν μὴ κατηγορεῖται λευκῶν ὁ ἄνθρωπος εἰλήφθω κύκνος καὶ χιών· οὐκοῦν τὸ ζῶον τοῦ μὲν παντὸς
 10 κατηγορεῖται τοῦ δὲ οὐδενός, ὥστε οὐκ ἔσται συλλογισμός. πάλιν τὸ μὲν Α μηδενὶ τῷ Β ὑπαρχέτω, τὸ δὲ Β τινὶ τῷ Γ μὴ ὑπαρχέτω, καὶ οἱ ὅροι ἔστωσαν ἄψυχον—ἄνθρωπος—λευκόν· εἰτα εἰλήφθωσαν, ὧν μὴ κατηγορεῖται λευκῶν ὁ ἄνθρωπος, κύκνος καὶ χιών· τὸ γὰρ ἄψυχον τοῦ μὲν παντὸς κατηγορεῖται τοῦ δὲ οὐδενός.
- 15 Ἔτι ἐπεὶ ἀδιόριστον τὸ τινὶ τῷ Γ τὸ Β μὴ ὑπάρχειν, ἀληθεύεται δὲ καὶ εἰ μηδενὶ ὑπάρχει καὶ εἰ μὴ παντὶ ὅτι τινὶ οὐχ ὑπάρχει, ληφθέντων δὲ τοιούτων ὅρων ὥστε μηδενὶ ὑπάρχειν οὐ γίγνεται συλλογισμός (τούτο γὰρ εἴρηται πρότερον), φανερόν οὖν ὅτι τῷ οὕτως ἔχειν τοὺς ὅρους οὐκ ἔσται
 20 συλλογισμός· ἦν γὰρ ἂν καὶ ἐπὶ τούτων. ὁμοίως δὲ δειχθήσεται καὶ εἰ τὸ καθόλου τεθείη στερητικόν.

Οὐδέ γ' ἐὰν ἄμφω τὰ διαστήματα κατὰ μέρος ἢ κατηγορικῶς ἢ στερητικῶς, ἢ τὸ μὲν κατηγορικῶς τὸ δὲ στερητικῶς λέγεται, ἢ τὸ μὲν ἀδιόριστον τὸ δὲ διωρισμένον, ἢ ἄμφω ἀδιόριστα, οὐκ ἔσται
 25 συλλογισμὸς οὐδαμῶς. ὅροι δὲ κοινοὶ πάντων ζῶον—λευκόν—ἵππος, ζῶον—λευκόν—λίθος.

Φανερόν οὖν ἐκ τῶν εἰρημένων ὡς ἐὰν ἢ συλ-

minor premiss is indefinite or particular ; *e.g.*, if A ^{AO-} applies to all B, and B does not apply to some or all of C ; for where the middle term does not apply to some of the minor, the major term may be associated with all or with none of the minor. Let us assume the terms animal—man—white ; next as examples of white things of which ‘man’ is not predicated let us take ‘swan’ and ‘snow.’ Then ‘animal’ is predicated of all the former, but of none of the latter. Thus there will be no syllogism. Again, let A ^{EO-} apply to no B, and let C not apply to some B ; let the terms be inanimate—man—white ; next take as examples of white things of which ‘man’ is not predicated ‘swan’ and ‘snow.’ ‘Inanimate’ is predicated of all the latter, but of none of the former.

Further, since the statement ‘B does not apply to some C’ is indefinite, and the statement is true whether B applies to no C or does not apply to all C ; and since when such terms are chosen that B applies to no C, we get no syllogism (this has been stated above ^a) : it is obvious that with the terms in this relation there will be no syllogism ; otherwise there would have been one with the terms which we selected. There will be a similar proof if the universal statement is taken as negative.

Also, if both the attributive relations are particular, and both affirmative or both negative, or one affirmative and the other negative ; or if one is indefinite and the other definite ; or if both are indefinite : in no case will there be a syllogism. Terms applicable to all these cases are animal—white—horse or animal—white—stone.

It is evident, then, from what we have said, that

26 b

λογισμὸς ἐν τούτῳ τῷ σχήματι κατὰ μέρος, ὅτι ἀνάγκη τοὺς ὅρους οὕτως ἔχειν ὥς εἵπομεν· ἄλλως γὰρ ἐχόντων οὐδαμῶς γίνεταί. δῆλον δὲ καὶ ὅτι πάντες οἱ ἐν αὐτῷ συλλογισμοὶ τέλειοι
 30 εἰσι· πάντες γὰρ ἐπιτελοῦνται διὰ τῶν ἐξ ἀρχῆς ληφθέντων· καὶ ὅτι πάντα τὰ προβλήματα δείκνυται διὰ τούτου τοῦ σχήματος· καὶ γὰρ τὸ παντὶ καὶ τὸ μηδενὶ καὶ τὸ τινὶ καὶ τὸ μὴ τινὶ ὑπάρχειν. καλῶ δὲ τὸ τοιοῦτον σχῆμα πρῶτον.

V. Ὅταν δὲ τὸ αὐτὸ τῷ μὲν παντὶ τῷ δὲ
 35 μηδενὶ ὑπάρχει, ἢ ἐκατέρῳ παντὶ ἢ μηδενὶ, τὸ μὲν σχῆμα τὸ τοιοῦτον καλῶ δεύτερον, μέσον δὲ ἐν αὐτῷ λέγω τὸ κατηγορούμενον ἀμφοῖν, ἄκρα δὲ καθ' ὧν λέγεται τοῦτο, μείζον δὲ ἄκρον τὸ πρὸς τῷ μέσῳ κείμενον, ἔλαττον δὲ τὸ πορρωτέρῳ τοῦ μέσου. τίθεται δὲ τὸ μέσον ἔξω μὲν τῶν ἄκρων, πρῶτον δὲ τῇ θέσει.

27 a

Τέλειος μὲν οὖν οὐκ ἔσται συλλογισμὸς οὐδαμῶς ἐν τούτῳ τῷ σχήματι, δυνατὸς δ' ἔσται καὶ καθόλου καὶ μὴ καθόλου τῶν ὁρῶν ὄντων. καθόλου μὲν οὖν ὄντων ἔσται συλλογισμὸς ὅταν τὸ μέσον τῷ μὲν παντὶ τῷ δὲ μηδενὶ ὑπάρχει, ἂν πρὸς
 5 ὁποτέρῳ ἢ τὸ στερητικόν· ἄλλως δ' οὐδαμῶς κατηγορεῖσθω γὰρ τὸ Μ τοῦ μὲν Ν μηδενὸς τοῦ δὲ Ξ παντός. ἐπεὶ οὖν ἀντιστρέφει τὸ στερητικόν, οὐδενὶ τῷ Μ ὑπάρξει τὸ Ν· τὸ δέ γε Μ παντὶ τῷ Ξ ὑπέκειτο· ὥστε τὸ Ν οὐδενὶ τῷ Ξ· τοῦτο γὰρ δέδεικται πρότερον. πάλιν εἰ τὸ Μ τῷ μὲν Ν
 10 παντὶ τῷ δὲ Ξ μηδενὶ, οὐδὲ τῷ Ξ τὸ Ν οὐδενὶ ὑπάρξει. εἰ γὰρ τὸ Μ οὐδενὶ τῷ Ξ, οὐδὲ τὸ Ξ

¹ τῷ Ξ τὸ Ν Α¹, Philoponus (?), Waitz: τὸ Ν τῷ Ξ miu, Trendelenburg: τὸ Ξ τῷ Ν BCdf.

if a syllogism in this figure has a particular conclusion, its terms must be related as we have described ; for if they are related otherwise there can in no case be a syllogism. It is clear also that all syllogisms in this figure are perfect (since they are all completed by means of the original assumptions) ; and that all kinds of propositions can be proved by this figure ; for it proves both universal and particular conclusions, whether affirmative or negative. I call this kind of figure the First.

V. When the same term applies to all of one subject and to none of the other, or to all or none of both, I call this kind of figure the Second ; and in it by the middle term I mean that which is predicated of both subjects ; by the extreme terms, the subjects of which the middle is predicated ; by the major term, that which comes next to the middle ; and by the minor that which is more distant from it. The middle is placed outside the extreme terms, and is first by position.

Second
Figure.

Position of
the terms.

Now there can in no case be a perfect syllogism in this figure ; but there can be a valid ^a syllogism, whether the terms are universal or not. If they are universal, there will be a syllogism when the middle applies to all of one subject and to none of the other, whichever of the two subjects is negatived ; but in no other case. *E.g.*, let M be predicated of no N, but of all O. Then since the negative premiss is convertible, N will apply to no M. But *ex hypothesi* M applies to all O. Therefore N applies to no O (this has been proved above ^b). Again, if M applies to all N but to no O, N will apply to no O. For if M applies

(1) Both
premisses
universal.

Cesare.

Camestres.

^a *i.e.* imperfect ; 24 b 22 ff.

^b In Celarent, 25 b 40.

27 a

οὐδενὶ τῷ Μ· τὸ δέ γε Μ παντὶ τῷ Ν ὑπῆρχεν· τὸ ἄρα Ξ οὐδενὶ τῷ Ν ὑπάρξει· γεγένηται γὰρ πάλιν τὸ πρῶτον σχῆμα. ἐπεὶ δὲ ἀντιστρέφει τὸ στερητικόν, οὐδὲ τὸ Ν οὐδενὶ τῷ Ξ ὑπάρξει, ὥστ' ἔσται ὁ αὐτὸς συλλογισμός. ἔστι δὲ δεικνύναι

15 ταῦτα καὶ εἰς τὸ ἀδύνατον ἄγοντας.

Ὅτι μὲν οὖν γίγνεται συλλογισμὸς οὕτως ἐχόντων τῶν ὄρων, φανερόν, ἀλλ' οὐ τέλειος· οὐ γὰρ μόνον ἐκ τῶν ἐξ ἀρχῆς ἀλλὰ καὶ ἐξ ἄλλων ἐπιτελεῖται τὸ ἀναγκαῖον.

Ἐὰν δὲ τὸ Μ παντὸς τοῦ Ν καὶ τοῦ Ξ κατηγορῇται, οὐκ ἔσται συλλογισμὸς. ὅροι τοῦ ὑπάρχειν οὐσία—ζῶον—ἄνθρωπος, τοῦ μὴ ὑπάρχειν οὐσία—ζῶον—ἀριθμός· μέσον οὐσία. οὐδ' ὅταν μῆτε τοῦ Ν μῆτε τοῦ Ξ μηδενὸς κατηγορῇται τὸ Μ. ὅροι τοῦ ὑπάρχειν γραμμὴ—ζῶον—ἄνθρωπος, τοῦ μὴ ὑπάρχειν γραμμὴ—ζῶον—λίθος.

Φανερόν οὖν ὅτι ἂν ἡ συλλογισμὸς καθόλου τῶν ὄρων ὄντων, ἀνάγκη τοὺς ὅρους ἔχειν ὡς ἐν ἀρχῇ
25 εἵπομεν· ἄλλως γὰρ ἐχόντων οὐ γίγνεται τὸ ἀναγκαῖον.

Ἐὰν δὲ πρὸς τὸν ἕτερον ἢ καθόλου τὸ μέσον, ὅταν μὲν πρὸς τὸν μείζω γένηται καθόλου ἢ κατηγορικῶς ἢ στερητικῶς, πρὸς δὲ τὸν ἐλάττω κατὰ μέρος καὶ ἀντικειμένως τῷ καθόλου (λέγω δὲ τὸ

* Sc. which proves the conclusion. Both Cesare and Camestres are proved by Celarent.

^b By assuming in each case the contradictory of the conclusion, viz., that N applies to some O, and combining this with the major premiss. The resulting syllogisms (in Ferio

to no O, O will apply to no M. But *ex hypothesi* M applies to all N. Therefore O will apply to no N ; for again we have the first figure. And since the negative statement is convertible, N will also apply to no O. Thus it will be the same syllogism as before.^a It is also possible to prove these results by reduction *ad impossibile*.^b

Thus it is evident that with the terms in this relation we get a syllogism, but not a perfect one ; because the necessary conclusion is completed not only by means of the original premisses but by others as well.

If, however, M is predicated of all N and all O, ^{AA-}there can be no syllogism. The positive relation of the extremes is illustrated by the terms substance—animal—man ; the negative relation by substance—animal—number (substance is the middle term). Nor can there be a syllogism if M is predicated of no N and of no O. The positive relation of the extremes ^{EE-}is illustrated by the terms line—animal—man ; the negative relation by line—animal—stone.

Thus it is evident that if there is a syllogism where the terms are universally related, the terms must be related as we stated at the beginning ^c ; for if they are otherwise related no conclusion follows by logical necessity.

If on the other hand the middle term is universally related to *one* of the others, when it is in a universal relation, either positive or negative, to the major term, and in a particular relation in the opposite sense to that of the universal relation (by ' in the opposite

(2) One universal and one particular premiss.

and Darii) give conclusions which are incompatible with the respective minor premisses.

^c 27 a 3.

27 a

20 ἀντικειμένως, εἰ μὲν τὸ καθόλου στερητικόν, τὸ ἐν
 μέρει καταφατικόν· εἰ δὲ κατηγορικόν τὸ καθόλου,
 τὸ ἐν μέρει στερητικόν), ἀνάγκη γίνεσθαι συλ-
 λογισμὸν στερητικόν κατὰ μέρος. εἰ γὰρ τὸ Μ τῷ
 μὲν Ν μηδενὶ τῷ δὲ Ξ τινὶ ὑπάρχει, ἀνάγκη τὸ Ν
 τινὶ τῷ Ξ μὴ ὑπάρχειν. ἐπεὶ γὰρ ἀντιστρέφει τὸ
 στερητικόν, οὐδενὶ τῷ Μ ὑπάρξει τὸ Ν· τὸ δέ γε
 25 Μ ὑπέκειτό τινι τῷ Ξ ὑπάρχειν· ὥστε τὸ Ν τινὶ τῷ
 Ξ οὐχ ὑπάρξει· γίνεται γὰρ συλλογισμὸς διὰ τοῦ
 πρώτου σχήματος. πάλιν εἰ τὸ μὲν Ν παντὶ τῷ Μ
 τῷ δὲ Ξ τινὶ μὴ ὑπάρχει, ἀνάγκη τὸ Ν τινὶ τῷ Ξ
 μὴ ὑπάρχειν· εἰ γὰρ παντὶ ὑπάρχει κατηγορεῖται δὲ
 27 b καὶ τὸ Μ παντὸς τοῦ Ν, ἀνάγκη τὸ Μ παντὶ τῷ Ξ
 ὑπάρχειν· ὑπέκειτο δὲ τινὶ μὴ ὑπάρχειν. καὶ εἰ τὸ
 Μ τῷ μὲν Ν παντὶ ὑπάρχει τῷ δὲ Ξ μὴ παντί,
 ἔσται συλλογισμὸς ὅτι οὐ παντὶ τῷ Ξ τὸ Ν· ἀπό-
 δειξις δ' ἡ αὐτή. εἰ δὲ τοῦ μὲν Ξ παντὸς τοῦ
 3 δὲ Ν μὴ παντὸς κατηγορῆται, οὐκ ἔσται συλλογι-
 σμός. ὅροι ζῶον—οὐσία—κόραξ, ζῶον—λευκόν—
 κόραξ. οὐδ' ὅταν τοῦ μὲν Ξ μηδενὸς τοῦ δὲ Ν
 τινός. ὅροι τοῦ ὑπάρχειν ζῶον—οὐσία—μονάς, τοῦ
 μὴ ὑπάρχειν ζῶον—οὐσία—ἐπιστήμη.

Ὅταν μὲν οὖν ἀντικείμενον ἢ τὸ καθόλου τῷ κατὰ
 10 μέρος, εἴρηται πότ' ἔσται καὶ πότ' οὐκ ἔσται
 συλλογισμός· ὅταν δὲ ὁμοιοσχήμενες ᾖσιν αἱ προ-
 τάσεις, οἷον ἀμφοτέραι στερητικαὶ ἢ καταφατικαί,
 οὐδαμῶς ἔσται συλλογισμός. ἔστωσαν γὰρ πρῶτον
 στερητικαί, καὶ τὸ καθόλου κείσθω πρὸς τὸ μείζον

• Viz. in Ferio, 26 a 25.

• In point of fact it is the same syllogism. There is no

sense ' I mean that if the universal relation is negative the particular relation is positive, and *vice versa*) to the minor term, the result must be a syllogism which is negative and particular. *E.g.*, if M applies to no N but to some O, it must follow that N does not apply to some O. For since the negative statement is convertible, N will apply to no M. But *ex hypothesi* M applies to some O, and so N will not apply to some O ; for we get a syllogism by means of the first figure.^a Again, if M applies to all N, but does not apply to some O, it must follow that N does not apply to some O. For if it applies to all, and M is predicated of all N, M must apply to all O. But *ex hypothesi* it does not apply to some. And if M applies to all N but not to all O, there will be a syllogism to the effect that N does not apply to all O. The proof is the same as before.^b If, however, M is predicated of all O but not of all N, there will be no syllogism. Terms to illustrate this case are animal—substance—crow, animal—white—crow. Nor will there be a syllogism when M is predicated of no O but of some N. The positive relation of the extremes may be illustrated by the terms animal—substance—unit ; the negative relation by animal—substance—science.

Thus we have stated under what conditions there will or will not be a syllogism when the universal is opposite in sense to the particular statement. When the premisses are similar in form, *i.e.* both negative or both affirmative, there will in no case be a syllogism. Let us first take them both as negative, and let the universal relation belong to the major term ; viz., let

real distinction between ' M does not apply to some O ' and ' M does not apply to all O.'

^a *i.e.* not of some N ; *cf.* previous note.

27 b

ἄκρον, οἷον τὸ Μ τῷ μὲν Ν μηδενὶ τῷ δὲ Ξ τινὶ
 15 μὴ ὑπαρχέτω· ἐνδέχεται δὴ καὶ παντὶ καὶ μηδενὶ
 τῷ Ξ τὸ Ν ὑπάρχειν. ὅροι τοῦ μὲν μὴ ὑπάρχειν
 μέλαν—χιών—ζῶον· τοῦ δὲ παντὶ ὑπάρχειν οὐκ
 ἔστι λαβεῖν, εἰ τὸ Μ τῷ Ξ τινὶ μὲν ὑπάρχει τινὶ δὲ
 μὴ. εἰ γὰρ παντὶ τῷ Ξ τὸ Ν τὸ δὲ Μ μηδενὶ τῷ
 Ν, τὸ Μ οὐδενὶ τῷ Ξ ὑπάρξει· ἀλλ' ὑπέκειτο τινὶ
 20 ὑπάρχειν. οὕτω μὲν οὖν οὐκ ἐγχωρεῖ λαβεῖν ὅρους,
 ἐκ δὲ τοῦ ἀδιορίστου δεικτέον· ἐπεὶ γὰρ ἀληθεύεται
 τὸ τινὶ μὴ ὑπάρχειν τὸ Μ τῷ Ξ καὶ εἰ μηδενὶ
 ὑπάρχει, μηδενὶ δὲ ὑπάρχοιτος οὐκ ἦν συλλο-
 γισμός, φανερόν ὅτι οὐδὲ νῦν ἔσται.

Πάλιν ἔστωσαν κατηγορικαί, καὶ τὸ καθόλου
 25 κείσθω ὁμοίως, οἷον τὸ Μ τῷ μὲν Ν παντὶ τῷ
 δὲ Ξ τινὶ ὑπαρχέτω. ἐνδέχεται δὴ τὸ Ν τῷ Ξ καὶ
 παντὶ καὶ μηδενὶ ὑπάρχειν. ὅροι τοῦ μηδενὶ ὑπ-
 ἀρχειν λευκόν—κύκνος—λίθος· τοῦ δὲ παντὶ οὐκ
 ἔσται λαβεῖν διὰ τὴν αὐτὴν αἰτίαν ἤνπερ πρότερον,
 ἀλλ' ἐκ τοῦ ἀδιορίστου δεικτέον.

Εἰ δὲ τὸ καθόλου πρὸς τὸ ἔλαττον ἄκρον ἐστὶ
 30 καὶ τὸ Μ τῷ μὲν Ξ μηδενὶ τῷ δὲ Ν τινὶ μὴ
 ὑπάρχει, ἐνδέχεται τὸ Ν τῷ Ξ καὶ παντὶ καὶ μη-
 δενὶ ὑπάρχειν. ὅροι τοῦ ὑπάρχειν λευκόν—ζῶον
 —κόραξ, τοῦ μὴ ὑπάρχειν λευκόν—λίθος—κόραξ.
 εἰ δὲ κατηγορικαί αἱ προτάσεις, ὅροι τοῦ μὴ
 ὑπάρχειν λευκόν—ζῶον—χιών, τοῦ ὑπάρχειν λευκόν
 —ζῶον—κύκνος.

M apply to no N, and not apply to some O. Then it is possible both for N to apply to all O and for it to apply to no O. The negative relation of the extremes may be illustrated by the terms black—snow—animal; but we cannot find terms to illustrate the positive universal relation, since M applies to some O although it also does not apply to some. For if N applies to all O, and M to no N, M will apply to no O; but *ex hypothesi* it applies to some. Thus it is not possible to find terms under these conditions, and our proof must be drawn from the indefinite nature of the particular premiss. For since it is true to say that M does not apply to some O if it in fact applies to none, and we saw that when it applies to none there is no syllogism, evidently there will be no syllogism in the present case either.

Again, let us take the premisses as affirmative, and ^{AI-} let the universal relation be the same as before; *i.e.* let M apply to all N and to some O. Then it is possible both for N to apply to all O and for it to apply to no O. Examples of terms where it applies to none are white—swan—stone; but it will be impossible to find examples where it applies to all O, for the same reason as before; and our proof must be drawn from the indefinite nature of the particular premiss.

If the universal relation belongs to the minor term, ^{OE-} *i.e.* if M applies to no O and does not apply to some N, it is possible both for N to apply to all O and for it to apply to no O. Examples of terms where it does apply are white—animal—crow; where it does not ^{IA-} apply, white—stone—crow. If the premisses are affirmative, examples of terms where the relation of the extremes is negative are white—animal—snow; where it is positive, white—animal—swan.

27 b

35 Φανερόν οὖν, ὅταν ὁμοιοσχήμονες ὦσιν αἱ προτάσεις καὶ ἡ μὲν καθόλου ἢ δ' ἐν μέρει, ὅτι οὐδαμῶς γίνεται συλλογισμός· ἀλλ' οὐδ' εἰ τιμὴ ἐκατέρω ὑπάρχει ἢ μὴ ὑπάρχει, ἢ τῷ μὲν τῷ δὲ μή, ἢ μηδετέρω¹ παντί, ἢ ἀδιορίστως. ὅροι δὲ κοινοὶ πάντων λευκόν—ζῶον—ἄνθρωπος, λευκόν—ζῶον—ἄψυχον.

28 a Φανερόν οὖν ἐκ τῶν εἰρημένων ὅτι ἐάν τε οὕτως ἔχωσιν οἱ ὅροι πρὸς ἀλλήλους ὡς ἐλέχθη, γίνεται συλλογισμὸς ἐξ ἀνάγκης, ἂν τ' ἢ συλλογισμός, ἀνάγκη τοὺς ὅρους οὕτως ἔχειν. δῆλον δὲ καὶ ὅτι
b πάντες ἀτελεῖς εἰσιν οἱ ἐν τούτῳ τῷ σχήματι συλλογισμοί (πάντες γὰρ ἐπιτελοῦνται προσλαμβανόμενων τινῶν, ἃ ἢ ἐνυπάρχει τοῖς ὅροις ἐξ ἀνάγκης ἢ τίθενται ὡς ὑποθέσεις, ὅλον ὅταν διὰ τοῦ ἀδυνατοῦ δεικνύωμεν), καὶ ὅτι οὐ γίνεται καταφατικὸς συλλογισμὸς διὰ τούτου τοῦ σχήματος, ἀλλὰ πάντες στερητικοί, καὶ οἱ καθόλου καὶ οἱ κατὰ μέρος.

10 VI. Ἐὰν δὲ τῷ αὐτῷ τὸ μὲν παντὶ τὸ δὲ μηδενὶ ὑπάρχει, ἢ ἅμφω παντὶ ἢ μηδενί, τὸ μὲν σχῆμα τὸ τοιοῦτον καλῶ τρίτον, μέσον δ' ἐν αὐτῷ λέγω καθ' οὗ ἅμφω τὰ κατηγορούμενα, ἅκρα δὲ τὰ κατηγορούμενα, μεῖζον δ' ἅκρον τὸ πορρώτερον τοῦ μέσου, ἔλαττον δὲ τὸ ἐγγύτερον· τίθεται δὲ τὸ
15 μέσον ἔξω μὲν τῶν ἁκρων ἔσχατον δὲ τῇ θέσει.

Τέλειος μὲν οὖν οὐ γίνεται συλλογισμὸς οὐδ' ἐν τούτῳ τῷ σχήματι, δυνατὸς δ' ἔσται καὶ καθόλου

¹ μηδ' ἐτέρω u, Waitz.

^a 27 a 3-5, 26-32.

^b Aristotle has in mind the formula which he uses in l. 18,

Thus it is evident that when the premisses are similar in form and when one is universal and the other particular, in no case do we get a syllogism ; nor again if the middle term applies or does not apply to some of each subject, or applies to some of one but not to some of the other, or does not apply to all of either, or is related to them indefinitely. Examples of terms which are applicable to all these cases are white—animal—man, white—animal—inanimate.

(3) Other combinations of premisses.
II-
OO-
IO-
OI-

Thus it is evident from the foregoing analysis that if the terms are related to one another in the manner described,^a a syllogism necessarily follows ; and that if there is a syllogism, the terms must be thus related. It is obvious also that all syllogisms in this figure are imperfect (since they are all completed by assuming certain additional premisses which are either necessarily implicit in the terms or assumed as hypotheses, e.g., when we prove our result by reduction *ad impossibile*) and that we do not get an affirmative syllogism by this figure ; all the syllogisms are negative, whether universal or particular.

VI. If one of the terms applies to all and the other to none of the same subject, or if both terms apply to all or none of it, I call this kind of figure the Third ; and in it by the middle I mean that of which both the predications are made ; by extremes the predicates ; by the major term that which is the middle ; and by the minor that which is nearer to it. The middle is placed outside the extremes, and is last by position.^b

Third Figure
Position of the terms.

Now we do not get a perfect syllogism in this figure either ; but there will be a valid ^c syllogism whether

(1) Both premisses universal.

where P stands for the major, R for the minor and S for the middle term.

^c i.e. imperfect.

28 a

καὶ μὴ καθόλου τῶν ὄρων ὄντων πρὸς τὸ μέσον.
καθόλου μὲν οὖν ὄντων, ὅταν καὶ τὸ Π καὶ τὸ Ρ
παντὶ τῷ Σ ὑπάρχῃ, ὅτι τινὶ τῷ Ρ τὸ Π ὑπάρξει
20 ἐξ ἀνάγκης· ἐπεὶ γὰρ ἀντιστρέφει τὸ κατηγορικόν,
ὑπάρξει τὸ Σ τινὶ τῷ Ρ, ὥστ' ἐπεὶ τῷ μὲν Σ παντὶ
τὸ Π τῷ δὲ Ρ τινὶ τὸ Σ, ἀνάγκη τὸ Π τινὶ τῷ Ρ
ὑπάρχειν· γίνεται γὰρ συλλογισμὸς διὰ τοῦ πρώ-
του σχήματος. ἔστι δὲ καὶ διὰ τοῦ ἀδυνάτου καὶ
τῷ ἐκθέσθαι ποιεῖν τὴν ἀπόδειξιν· εἰ γὰρ ἄμφω
25 παντὶ τῷ Σ ὑπάρχει, ἂν ληφθῇ τι τῶν Σ οἷον τὸ
Ν, τούτῳ καὶ τὸ Π καὶ τὸ Ρ ὑπάρξει, ὥστε τινὶ
τῷ Ρ τὸ Π ὑπάρξει.

Καὶ ἂν τὸ μὲν Ρ παντὶ τῷ Σ τὸ δὲ Π μηδενὶ
ὑπάρχῃ, ἔσται συλλογισμὸς ὅτι τὸ Π τινὶ τῷ Ρ
οὐχ ὑπάρξει ἐξ ἀνάγκης· ὁ γὰρ αὐτὸς τρόπος τῆς
ἀποδείξεως ἀντιστραφείσης τῆς ΡΣ προτάσεως.
30 δειχθεῖν δ' ἂν καὶ διὰ τοῦ ἀδυνάτου, καθάπερ ἐπὶ
τῶν προτέρων.

Ἐὰν δὲ τὸ μὲν Ρ μηδενὶ τὸ δὲ Π παντὶ ὑπάρχῃ
τῷ Σ, οὐκ ἔσται συλλογισμὸς. ὅροι τοῦ ὑπάρχειν
ζῶον—ἵππος—ἄνθρωπος, τοῦ μὴ ὑπάρχειν ζῶον
—ἄψυχον—ἄνθρωπος. οὐδ' ὅταν ἄμφω κατὰ μη-
δενὸς τοῦ Σ λέγῃται, οὐκ ἔσται συλλογισμὸς.
35 ὅροι τοῦ ὑπάρχειν ζῶον—ἵππος—ἄψυχον, τοῦ μὴ
ὑπάρχειν ἄνθρωπος—ἵππος—ἄψυχον· μέσον ἄψυχον.

Φανερόν οὖν καὶ ἐν τούτῳ τῷ σχήματι πότ'
ἔσται καὶ πότ' οὐκ ἔσται συλλογισμὸς καθόλου τῶν
ὄρων ὄντων. ὅταν μὲν γὰρ ἀμφοτέροι οἱ ὅροι ὡς
κατηγορικοί, ἔσται συλλογισμὸς ὅτι τινὶ ὑπάρχει

* In Darii, 26 a 23.

† This does not, of course, mean that the conclusion is apodeictic, but that it follows necessarily from the premisses.

the terms are in a universal relation to the middle or not. If they are in a universal relation, when both P and R apply to all S, it will necessarily follow that P applies to some R; for since the affirmative statement is convertible, S will apply to some R, and so since P applies to all S and S to some R, P must apply to some R; for we get a syllogism by means of the first figure.^a It is also possible to prove this by reduction *ad impossibile*, and by exposition; for where both terms apply to all S, if we take one of the Ss, e.g. N, both P and R will apply to it, and so P will apply to some R. Darapti.

Also if R applies to all S, and P to none, there will be a syllogism to the effect that P necessarily^b does not apply to some R. The method of proof is the same as before, the premiss RS being converted.^c The result could also be proved by reduction *ad impossibile*, as in the former examples. Felapton.

If, however, R applies to no S and P to all S, there will be no syllogism. Examples of terms where the relation of the extremes is positive are animal—horse—man; where it is negative, animal—inanimate—man. Nor will there be a syllogism when both terms are predicated of no S. Examples of terms where the relation of the extremes is positive are animal—horse—inanimate; where it is negative, man—horse—inanimate. Here 'inanimate' is the middle term. AE-EE-

It is evident, then, in this figure also when there will or will not be a syllogism if the terms are universally related. When both the terms are affirmative,^d there will be a syllogism to the effect that one extreme

^a This gives a syllogism in Ferio, 26 a 25.

^d A loose and, strictly speaking, meaningless expression. Aristotle should have said 'when both premisses are affirmative.'

28 ^b τὸ ἄκρον τῷ ἄκρῳ, ὅταν δὲ στερητικοί, οὐκ ἔσται· ὅταν δ' ὁ μὲν ἦ στερητικός ὁ δὲ καταφατικός, εἰ μὲν ὁ μείζων γένηται στερητικός ἄτερος δὲ καταφατικός, ἔσται συλλογισμός ὅτι τινὶ οὐχ ὑπάρχει τὸ ἄκρον τῷ ἄκρῳ, εἰ δ' ἀνάπαλιν, οὐκ ἔσται.

6 Ἐάν δ' ὁ μὲν ἦ καθόλου πρὸς τὸ μέσον ὁ δ' ἐν μέρει, κατηγορικῶν μὲν οἰτων ἀμφοῖν ἀνάγκη γίγνεσθαι συλλογισμόν, ἂν ὁποτεροσοῦν ἦ καθόλου τῶν ὄρων. εἰ γὰρ τὸ μὲν P παιτὶ τῷ Σ τὸ δὲ Π τινί, ἀνάγκη τὸ Π τινὶ τῷ P ὑπάρχειν· ἐπεὶ γὰρ 10 ἀντιστρέφει τὸ καταφατικόν, ὑπάρξει τὸ Σ τινὶ τῷ Π, ὥστ' ἐπεὶ τὸ μὲν P παντὶ τῷ Σ τὸ δὲ Σ τινὶ τῷ Π, καὶ τὸ P τινὶ τῷ Π ὑπάρξει· ὥστε τὸ Π τινὶ τῷ P. πάλιν εἰ τὸ μὲν P τινὶ τῷ Σ τὸ δὲ Π παιτὶ ὑπάρχει, ἀνάγκη τὸ Π τινὶ τῷ P ὑπάρχειν· ὁ γὰρ αὐτὸς τρόπος τῆς ἀποδείξεως. ἔστι δ' ἀποδείξαι καὶ διὰ τοῦ ἀδυνάτου καὶ τῇ 15 ἐκθέσει, καθάπερ ἐπὶ τῶν προτέρων.

Ἐάν δ' ὁ μὲν ἦ κατηγορικός ὁ δὲ στερητικός, καθόλου δὲ ὁ κατηγορικός, ὅταν μὲν ὁ ἐλάττων ἦ κατηγορικός, ἔσται συλλογισμός· εἰ γὰρ τὸ P παντὶ τῷ Σ τὸ δὲ Π τινὶ μὴ ὑπάρχει, ἀνάγκη τὸ Π τινὶ τῷ P μὴ ὑπάρχειν (εἰ γὰρ παντί, καὶ τὸ P 20 παντὶ τῷ Σ, καὶ τὸ Π παντὶ τῷ Σ ὑπάρξει· ἀλλ' οὐχ ὑπῆρχεν· δείκνυται δὲ καὶ ἄνευ τῆς ἀπαγωγῆς, εἰ μὴ ληφθῇ τι τῶν Σ ὃ τὸ Π μὴ ὑπάρχει)· ὅταν δ' ὁ μείζων ἦ κατηγορικός, οὐκ ἔσται συλλογισμός, οἷον εἰ τὸ μὲν Π παντὶ τῷ Σ τὸ δὲ P τινὶ τῷ Σ μὴ ὑπάρχει. ὅροι τοῦ παντὶ ὑπάρχειν ἐμψυχον—

* By Darii in the first figure.

† Sc. by converting the premiss RS, which again gives a syllogism in Darii.

applies to some of the other ; but when they are negative there will be no syllogism. When one term is negative and the other affirmative, if the major is negative and the other affirmative, there will be a syllogism to the effect that one extreme does not apply to some of the other ; but with the opposite arrangement there will be no syllogism.

If, however, one of the terms is in a universal and the other in a particular relation to the middle, where both are affirmative a syllogism must follow, whichever of the two terms is universal. For if R applies to all S and P to some S, P must apply to some R ; for since the affirmative premiss is convertible, S will apply to some P, and so since R applies to all S and S to some P, R will also apply to some P,^a and so P will apply to some R. Again, if R applies to some S and P to all S, P must apply to some R. The method of proof is the same as before.^b It is also possible to prove this result by reduction *ad impossibile* and by exposition, just as in the previous examples.

If one term is affirmative and the other negative, and the former is universal, when the minor term is affirmative there will be a syllogism. For if R applies to all S, and P does not apply to some S, it necessarily follows that P does not apply to some R. For if it applies to all R, and R to all S, P will also apply to all S^c ; but *ex hypothesi* it does not. This can also be proved without reduction *ad impossibile* if we take some S to which P does not apply. But when the major is affirmative, there will be no syllogism ; e.g., if P applies to all S and R does not apply to some S. Examples of terms where the relation of the extremes is universal and positive are animate—man—animal ;

(2) One universal and one particular premiss. Disamis.

Datisl.

Bocardo.

AO-

^a Barbara.

28 b

25 ἄνθρωπος—ζῶον· τοῦ δὲ μηδενὶ οὐκ ἔστι λαβεῖν ὄρους, εἰ τινὶ μὲν ὑπάρχει τῷ Σ τὸ Ρ τινὶ δὲ μὴ· εἰ γὰρ παντὶ τὸ Π τῷ Σ ὑπάρχει τὸ δὲ Ρ τινὶ τῷ Σ, καὶ τὸ Π τινὶ τῷ Ρ ὑπάρξει· ὑπέκειτο δὲ μηδενὶ ὑπάρχειν. ἀλλ' ὥσπερ ἐν τοῖς πρότερον ληπτέον· ἀδιορίστου γὰρ ὄντος τοῦ τινὶ μὴ ὑπάρχειν καὶ τὸ
30 μηδενὶ ὑπάρχον ἀληθὲς εἰπεῖν τινὶ μὴ ὑπάρχειν· μηδενὶ δὲ ὑπάρχοντος οὐκ ἦν συλλογισμός· φανερόν οὖν ὅτι οὐκ ἔσται συλλογισμός.

Ἐὰν δ' ὁ στερητικὸς ἢ καθόλου τῶν ὄρων, ὅταν μὲν ὁ μείζων ἢ στερητικὸς ὁ δὲ ἐλάττων κατηγορικὸς, ἔσται συλλογισμός· εἰ γὰρ τὸ Π μηδενὶ τῷ Σ τὸ δὲ Ρ τινὶ ὑπάρχει τῷ Σ, τὸ Π τινὶ τῷ Ρ
35 οὐχ ὑπάρξει, πάλιν γὰρ ἔσται τὸ πρῶτον σχῆμα τῆς ΡΣ προτάσεως ἀντιστραφείσης· ὅταν δὲ ὁ ἐλάττων ἢ στερητικὸς, οὐκ ἔσται συλλογισμός· ὅροι τοῦ ὑπάρχειν ζῶον—ἄνθρωπος—ἄγριον, τοῦ μὴ ὑπάρχειν ζῶον—ἐπιστήμη—ἄγριον· μέσον ἐν ἀμφοῖν τὸ ἄγριον.

Οὐδ' ὅταν ἀμφοτέροι στερητικοὶ τεθῶσιν, ἢ δ'
29 α ὁ μὲν καθόλου ὁ δ' ἐν μέρει. ὅροι ὅταν ὁ ἐλάττων ἢ καθόλου πρὸς τὸ μέσον, ζῶον—ἐπιστήμη—ἄγριον, ζῶον—ἄνθρωπος—ἄγριον· ὅταν δ' ὁ μείζων, τοῦ μὲν μὴ ὑπάρχειν κόραξ—χιών—λευκόν· τοῦ δ' ὑπάρχειν οὐκ ἔστι λαβεῖν, εἰ τὸ Ρ τινὶ μὲν ὑπάρχει
5 τῷ Σ τινὶ δὲ μὴ ὑπάρχει (εἰ γὰρ τὸ Π παντὶ τῷ

¹ ἐν om. Cⁱⁿ.

* i.e. on the assumption that the relation of the extremes is universal and negative.

but we cannot find terms where the relation is universal and negative, since R applies to some S although it also does not apply to some. For if P applies to all S, and R to some S, then P will apply to some R. But *ex hypothesi*^a it applies to none. The explanation must be apprehended as in the former examples^b; for since the statement that one term does not apply to another is indefinite, it is true to say that that which applies to none does not apply to some; but we saw^c that when R applies to no S there is no syllogism. Thus it is evident that there will be no syllogism in this case.

If, however, the negative term is universal, when the major is negative and the minor affirmative, there will be a syllogism. For if P applies to no S, and R applies to some S, P will not apply to some R; for we shall have the first figure^d again when the premiss RS is converted. But when the minor term is IE-negative there will be no syllogism. Examples of terms where the relation of the extremes is positive are animal—man—wild; where it is negative, animal—science—wild. In both cases 'wild' is the middle term.

Nor will there be a syllogism when both terms are taken negatively, and one is universal and the other particular. Examples of terms when it is the minor term that is in a universal relation to the middle are OE-animal—science—wild, animal—man—wild. When it is the major that is in this relation, examples of EO-terms where the relation of the extremes is negative are crow—snow—white; but where it is positive terms cannot be found, since R applies to some S although it also does not apply to some (for if P

^b 27 b 20, 28.

^c 28 a 30.

^d In Ferio, 26 a 25.

29 a

P τὸ δὲ P τινὶ τῷ Σ, καὶ τὸ Π τινὶ τῷ Σ· ὑπέκειτο δὲ μηδενί), ἀλλ' ἐκ τοῦ ἀδιορίστου δεικτέον.

Οὐδ' ἂν ἐκάτερος τινὶ τῷ μέσῳ ὑπάρχη ἢ μὴ ὑπάρχη, ἢ ὁ μὲν ὑπάρχη ὁ δὲ μὴ ὑπάρχη, ἢ ὁ μὲν τινὶ ὁ δὲ μὴ παντί, ἢ ἀδιορίστως, οὐκ ἔσται συλλογισμὸς οὐδαμῶς. ὅροι δὲ κοινοὶ πάντων ζῶον—
10 ἄνθρωπος—λευκόν, ζῶον—ἄψυχον—λευκόν.

Φανερόν οὖν καὶ ἐν τούτῳ τῷ σχήματι πότ' ἔσται καὶ πότ' οὐκ ἔσται συλλογισμὸς, καὶ ὅτι ἐχόντων τε τῶν ὄρων ὡς ἐλέχθη γίγνεται συλλογισμὸς ἐξ ἀνάγκης, ἂν τ' ἢ συλλογισμὸς, ἀνάγκη τοὺς ὅρους οὕτως ἔχειν. φανερόν δὲ καὶ ὅτι
15 πάντες ἀτελεῖς εἰσιν οἱ ἐν τούτῳ τῷ σχήματι συλλογισμοί (πάντες γὰρ τελειοῦνται προσλαμβάνομένων τινῶν) καὶ ὅτι συλλογίσασθαι τὸ καθόλου διὰ τούτου τοῦ σχήματος οὐκ ἔσται οὔτε στερητικὸν οὔτε καταφατικόν.

VII. Δῆλον δὲ καὶ ὅτι ἐν ἅπασιν τοῖς σχήμασιν,
20 ὅταν μὴ γίγηται συλλογισμὸς, κατηγορικῶν μὲν ἢ στερητικῶν ἀμφοτέρων ὄντων τῶν ὄρων οὐδὲν ὅλως γίγνεται ἀναγκαῖον, κατηγορικοῦ δὲ καὶ στερητικοῦ, καθόλου ληφθέντος τοῦ στερητικοῦ ἀεὶ γίγνεται συλλογισμὸς τοῦ ἐλάττονος ἄκρου πρὸς τὸ μεῖζον, οἷον εἰ τὸ μὲν Α παντὶ τῷ Β ἢ
25 τινί, τὸ δὲ Β μηδενὶ τῷ Γ· ἀντιστρεφόμενων γὰρ

PRIOR ANALYTICS, I. VI-VII

applies to all R, and R to some S, P also applies to some S ; but *ex hypothesi* it applies to none) ; the proof must be drawn from the indefinite nature of the particular premiss.^a

Furthermore, if both terms apply or do not apply to some of the middle, or if one applies to some and the other does not, or if one applies to some and the other does not apply to all, or if they are related to the middle indefinitely, there will in no case be a syllogism. Examples of terms common to all these cases are animal—man—white, animal—inanimate—white.

Thus it is evident in this figure also when there will or will not be a syllogism ; and that where the terms are related in the manner described ^b a syllogism necessarily follows ; and that if there is a syllogism the terms must be so related. It is evident also that all the syllogisms in this figure are imperfect (since they are all completed by assuming certain additional premisses) ; and that it will be impossible to reach a universal conclusion, either negative or affirmative, by means of this figure.

VII. It is clear also that in all the figures, whenever we get no <direct> syllogism, where the terms are both affirmative or both negative, there is no necessary conclusion at all ; but where one term is affirmative and the other negative, if the negative term is universal we always get a syllogism establishing a relation of the minor to the major extreme.^c *E.g.*, if A applies to all ^d or some ^e B, and B to no C ; for if

(3) Other combinations of premisses. II-, OO-, IO-, OI-.

General remarks on the three figures. Indirect conclusion.

^a Cf. 27 b 20.

^b 28 a 18, 26, 28 b 5, 15, 31.

^c The minor being the predicate and the major the subject.

^d Fapesmo in the first, Fesapo in the fourth figure.

^e Frisesomorum in the first, Fresison in the fourth figure.

29^a

τῶν προτάσεων ἀνάγκη τὸ Γ τινὶ τῷ Α μὴ ὑπάρχειν. ὁμοίως δὲ καὶ τῶν ἐτέρων σχημάτων· αἰεὶ γὰρ γίνεταί διὰ τῆς ἀντιστροφῆς συλλογισμός. δῆλον δὲ καὶ ὅτι τὸ ἀδιόριστον ἀντὶ τοῦ κατηγορικοῦ τοῦ ἐν μέρει τιθέμενον τὸν αὐτὸν ποιήσει συλλογισμὸν ἐν ᾧ πασι τοῖς σχήμασιν.

80 Φανερόν δὲ καὶ ὅτι πάντες οἱ ἀτελεῖς συλλογισμοὶ τελειοῦνται διὰ τοῦ πρώτου σχήματος. ἡ γὰρ δεικτικῶς ἢ διὰ τοῦ ἀδυνάτου περαίνονται πάντες· ἀμφοτέρως δὲ γίνεταί τὸ πρῶτον σχῆμα, δεικτικῶς μὲν τελειουμένων, ὅτι διὰ τῆς ἀντιστροφῆς ἐπεραίνοντο πάντες, ἢ δ' ἀντιστροφή τὸ πρῶτον
81 ἐποίει σχῆμα, διὰ δὲ τοῦ ἀδυνάτου δεικνυμένων, ὅτι τεθέντος τοῦ ψευδοῦς ὁ συλλογισμὸς γίνεταί διὰ τοῦ πρώτου σχήματος· οἷον ἐν τῷ τελευταίῳ σχήματι, εἰ τὸ Α καὶ τὸ Β παντὶ τῷ Γ ὑπάρχει, ὅτι τὸ Α τινὶ τῷ Β ὑπάρχει· εἰ γὰρ μηδενί, τὸ δὲ Β παντὶ τῷ Γ, οὐδενὶ τῷ Γ τὸ Α· ἀλλ' ἦν παντί. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.

29^b

Ἔστι δὲ καὶ ἀναγαγεῖν πάντας τοὺς συλλογισμοὺς εἰς τοὺς ἐν τῷ πρώτῳ σχήματι καθόλου συλλογισμοὺς. οἱ μὲν γὰρ ἐν τῷ δευτέρῳ φανερόν ὅτι δι' ἐκείνων τελειοῦνται, πλὴν οὐχ ὁμοίως πάντες, ἀλλ'
5 οἱ μὲν καθόλου τοῦ στερητικοῦ ἀντιστραφέντος, τῶν δ' ἐν μέρει ἑκάτερος διὰ τῆς εἰς τὸ ἀδύνατον ἀπαγωγῆς· οἱ δ' ἐν τῷ πρώτῳ οἱ κατὰ μέρος ἐπιτελοῦνται μὲν καὶ δι' αὐτῶν, ἔστι δὲ καὶ διὰ

^a In either case we get by conversion : C applies to no B
B applies to no A
∴ C does not apply
to some A (Ferio).

^b In the second and third figures this is effected simply by

the premisses are converted it necessarily follows that C does not apply to some A.^a Similarly too in the other figures, for we always get a syllogism by the process of conversion.^b It is obvious also that in all the figures if the particular affirmative is replaced by the indefinite the result will be the same syllogism.

It is evident also that all imperfect syllogisms are completed by means of the first figure. For all the conclusions are reached either by demonstration or by reduction *ad impossibile*, and in both cases we get the first figure: in the case of those which are completed by demonstration because, as we have seen, all the conclusions are reached by means of conversion, and the conversion produces the first figure; and in the case of those which are demonstrated by reduction *ad impossibile* because if a false premiss is assumed we get the syllogism by means of the first figure. *E.g.*, in the last figure, if A and B apply to all C, we get a syllogism ^c to the effect that A applies to some B; for if it applies to no B, and B applies to all C, A applies to no C. But *ex hypothesi* it applies to all C. Similarly too in the other cases.

It is possible also to reduce all syllogisms to the universal syllogisms in the first figure. Those in the second figure are obviously completed by their help, but not all in a similar manner: the universal syllogisms are completed by the conversion of the negative statement, and each of the particular ones by a reduction *ad impossibile*. The particular syllogisms in the first figure are indeed completed by means of themselves, but it is possible also to prove them by means

transposing the premisses. AE gives Cesare and Felapton; IE gives Festino and Ferison.

^c In Darapti.

All imperfect syllogisms are validated in the first figure.

All syllogisms reducible to the universal syllogisms of the first figure.

29 b

- τοῦ δευτέρου σχήματος δεικνύναι εἰς ἀδύνατον ἀπαγοντας, ὅλον εἰ τὸ Α παντὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ, ὅτι τὸ Α τινὶ τῷ Γ. εἰ γὰρ μηδενί, τῷ δὲ Β παντί, οὐδενὶ τῷ Γ τὸ Β ὑπάρξει· τοῦτο γὰρ ἴσμεν διὰ τοῦ δευτέρου σχήματος. ὁμοίως δὲ καὶ ἐπὶ τοῦ στερητικοῦ ἔσται ἡ ἀπόδειξις. εἰ γὰρ τὸ Α μηδενὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ ὑπάρχει, τὸ Α τινὶ τῷ Γ οὐχ ὑπάρξει· εἰ γὰρ παντί, τῷ δὲ Β μηδενὶ ὑπάρχει, οὐδενὶ τῷ Γ τὸ Β ὑπάρξει· τοῦτο δ' ἦν τὸ μέσον σχῆμα. ὥστ' ἐπεὶ οἱ μὲν ἐν τῷ μέσῳ σχήματι συλλογισμοὶ πάντες ἀνάγονται εἰς τοὺς ἐν τῷ πρώτῳ καθόλου συλλογισμούς, οἱ δὲ κατὰ μέρος ἐν τῷ πρώτῳ εἰς τοὺς ἐν τῷ μέσῳ, φανερόν ὅτι καὶ οἱ κατὰ μέρος ἀναχθήσονται εἰς τοὺς ἐν τῷ πρώτῳ σχήματι καθόλου συλλογισμούς.
- Οἱ δ' ἐν τῷ τρίτῳ καθόλου μὲν ὄντων τῶν ὄρων εὐθὺς ἐπιτελοῦνται δι' ἐκείνων τῶν συλλογισμῶν, ὅταν δ' ἐν μέρει ληφθῶσι, διὰ τῶν ἐν μέρει συλλογισμῶν τῶν ἐν τῷ πρώτῳ σχήματι· οὗτοι δὲ ἀνήχθησαν εἰς ἐκείνους, ὥστε καὶ οἱ ἐν τῷ τρίτῳ σχήματι οἱ κατὰ μέρος. φανερόν οὖν ὅτι πάντες ἀναχθήσονται εἰς τοὺς ἐν τῷ πρώτῳ σχήματι καθόλου συλλογισμούς.

Οἱ μὲν οὖν τῶν συλλογισμῶν ὑπάρχειν ἢ μὴ ὑπάρχειν δεικνύντες εἴρηται πῶς ἔχουσι, καὶ καθ' αὐτοὺς οἱ ἐκ τοῦ αὐτοῦ σχήματος καὶ πρὸς ἀλλήλους οἱ ἐκ τῶν ἐτέρων σχημάτων.¹

VIII. Ἐπεὶ δ' ἕτερόν ἐστιν ὑπάρχειν τε καὶ ἔξ

¹ σχημάτων om. d.

^a Camestres.

^b 26 b 34.

^c i.e. the universal syllogisms of the first figure.

of the second figure if we employ reduction *ad impossibile* ; e.g., if A applies to all B, and B to some C, to prove that A applies to some C. For if it applies to no C, but to all B, B will apply to no C ; for we know this by means of the second figure.^a The proof will take a similar form also in the case of the negative relation. For if A applies to no B, and B applies to some C, A will not apply to some C. For if it applies to all C, but to no B, B will apply to no C ; and this is of the form which we described^b as the middle figure. And so since the syllogisms in the middle figure can all be reduced to the universal syllogisms in the first figure, and the particular syllogisms in the first figure to the universal syllogisms in the second, it is evident that the particular syllogisms (in the first figure) can also be reduced to the universal syllogisms in that figure.

As for the syllogisms in the third figure, when the terms are universal, they are completed directly by means of the syllogisms mentioned above^c ; but when the terms are particular, they are completed by means of the particular syllogisms in the first figure. But these, as we have seen, can be reduced to those mentioned above ; and therefore so can the particular syllogisms in the third figure. Thus it is evident that all syllogisms can be reduced to the universal syllogisms in the first figure.

Thus we have stated, with reference to those syllogisms which demonstrate that a predicate simply applies or does not apply to a subject, how those of the same figure are related among themselves, and how those of different figures are related to one another.

VIII. Since ' to apply ' is not the same as ' neces-

29 b

30 ἀνάγκης ὑπάρχειν καὶ ἐνδέχεσθαι ὑπάρχειν (πολλὰ γὰρ ὑπάρχει μὲν, οὐ μέντοι ἐξ ἀνάγκης· τὰ δ' οὐτ' ἐξ ἀνάγκης οὐθ' ὑπάρχει ὅλως, ἐνδέχεται δ' ὑπάρχειν), δηλὸν ὅτι καὶ συλλογισμὸς ἐκάστου τούτων ἕτερος ἔσται, καὶ οὐχ ὁμοίως ἐχόντων τῶν ὄρων, ἀλλ' ὁ μὲν ἐξ ἀναγκαίων ὁ δ' ἐξ ὑπαρχόντων
 25 ὁ δ' ἐξ ἐνδεχομένων.

Ἐπὶ μὲν οὖν τῶν ἀναγκαίων σχεδὸν ὁμοίως ἔχει καὶ ἐπὶ τῶν ὑπαρχόντων· ὡσαύτως γὰρ τιθεμένων τῶν ὄρων ἐν τε τῷ ὑπάρχειν καὶ τῷ ἐξ ἀνάγκης ὑπάρχειν ἢ μὴ ὑπάρχειν ἔσται τε καὶ οὐκ ἔσται
 30 α. συλλογισμὸς, πλὴν διοίσει τῷ προσκεῖσθαι τοῖς ὄροις τὸ ἐξ ἀνάγκης ὑπάρχειν ἢ μὴ ὑπάρχειν· τό τε γὰρ στερητικὸν ὡσαύτως ἀντιστρέφει, καὶ τὸ ἐν ὅλῳ εἶναι καὶ τὸ κατὰ παντὸς ὁμοίως ἀποδύομεν.

Ἐν μὲν οὖν τοῖς ἄλλοις τὸν αὐτὸν τρόπον δεῖ-
 5 χθήσεται διὰ τῆς ἀντιστροφῆς τὸ συμπέρασμα ἀναγκαῖον ὥσπερ ἐπὶ τοῦ ὑπάρχειν· ἐν δὲ τῷ μέσῳ σχήματι ὅταν ἢ τὸ καθόλου καταφατικὸν τὸ δ' ἐν μέρει στερητικόν, καὶ πάλιν ἐν τῷ τρίτῳ ὅταν τὸ μὲν καθόλου κατηγορικὸν τὸ δ' ἐν μέρει στερητικόν, οὐχ ὁμοίως ἔσται ἢ ἀπόδειξις, ἀλλ' ἀνάγκη
 10 ἐκθεμένους ὥ τινι ἐκάτερον μὴ ὑπάρχει, κατὰ τούτου ποιεῖν τὸν συλλογισμὸν· ἔσται γὰρ ἀναγ-

* Cf. note on 25 a 2.

† Cf. 25 a 5.

• 24 b 26.

* The syllogisms in Baroco and Bocardo, when assertoric, are proved by reduction *ad impossibile*, i.e. by assuming the contradictory of the conclusion which it is required to prove (27 a 38, 28 b 19). But the contradictory of an apodeictic judgement is problematic; and the combination of an apo-

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sarily to apply ' or ' possibly to apply ' (because there are many predicates which apply, but not necessarily ; and others neither apply necessarily nor indeed apply at all, but it is possible that they should apply), it is clear that the syllogism also is different in each of these cases, and that the terms are not related in the same way, but that one type of syllogism is composed of apodeictic, another of assertoric, and another of problematic premisses.^a

Assertoric,
apodeictic
and
problematic
syllogisms.

If the premisses are apodeictic the conditions are, roughly speaking, the same as when they are assertoric. When the terms are related in the same way, then both in assertoric and in apodeictic propositions, whether affirmative or negative, a syllogism will or will not result in the same way. The only difference will be that the terms will have attached to them the words ' *necessarily* applies ' or ' *necessarily* does not apply.' For the negative premiss converts in the same way,^b and we shall give the same explanation^c of the expression ' to be wholly contained in ' or ' to be predicated of all.'

Apodeictic
generally
follow the
rules for
assertoric
syllogisms.

Thus in all the other cases the conclusion will be shown to be necessary in the same way as in an assertoric syllogism, by means of conversion ; but in the middle figure, when the universal statement is affirmative and the particular negative, and again in the third figure when the universal statement is affirmative and the particular negative, the proof will not take the same form.^d We must take examples of that portion of its subject to which each predicate does not apply, and draw the conclusion from this ; for with this combination of terms we shall get a

Exceptions.

deictic with a problematic premiss cannot give an apodeictic conclusion (ch. xvi).

30 a

καίως ἐπὶ τούτων· εἰ δὲ κατὰ τοῦ ἐκτεθέντος ἐστὶν ἀναγκαῖος, καὶ κατ' ἐκείνου τινός· τὸ γὰρ ἐκτεθὲν ὅπερ ἐκείνὸ τί ἐστίν. γίνεταί δὲ τῶν συλλογισμῶν ἐκάτερος ἐν τῷ οἰκείῳ σχήματι.

- 15 IX. Συμβαίνει δέ ποτε καὶ τῆς ἐτέρας προτάσεως ἀναγκαῖας οὔσης ἀναγκαῖον γίνεσθαι τὸν συλλογισμόν, πλὴν οὐχ ὅποτέρας ἔτυχεν, ἀλλὰ τῆς πρὸς τὸ μείζον ἄκρον· οἷον εἰ τὸ μὲν Α τῷ Β ἐξ ἀνάγκης εἰληπταὶ ὑπάρχον (ἢ μὴ ὑπάρχον), τὸ δὲ Β τῷ Γ ὑπάρχον μόνον· οὕτως γὰρ εἰλημμένων τῶν
20 προτάσεων ἐξ ἀνάγκης τὸ Α τῷ Γ ὑπάρξει (ἢ οὐχ ὑπάρξει)· ἐπεὶ γὰρ παντὶ τῷ Β ἐξ ἀνάγκης ὑπάρχει (ἢ οὐχ ὑπάρχει) τὸ Α, τὸ δὲ Γ τι τῶν Β ἐστί, φανερόν ὅτι καὶ τῷ Γ ἐξ ἀνάγκης ἔσται θάτερον τούτων.

- Εἰ δὲ τὸ μὲν ΑΒ μὴ ἐστίν ἀναγκαῖον τὸ δὲ ΒΓ
25 ἀναγκαῖον, οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον. εἰ γὰρ ἔστι,¹ συμβήσεται τὸ Α τινὶ τῷ Β ὑπάρχειν ἐξ ἀνάγκης διὰ τε τοῦ πρώτου καὶ διὰ τοῦ τρίτου σχήματος. τοῦτο δὲ ψεῦδος· ἐνδέχεται γὰρ τοιοῦτον εἶναι τὸ Β ᾧ ἐγχωρεῖ τὸ Α μηδενὶ ὑπάρχειν. ἔτι καὶ ἐκ τῶν ὄρων φανερόν ὅτι οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον, οἷον εἰ τὸ μὲν Α εἴη
80 κίνησις, τὸ δὲ Β ζῶον, ἐφ' ᾧ δὲ τὸ Γ ἄνθρωπος· ζῶον μὲν γὰρ ὁ ἄνθρωπος ἐξ ἀνάγκης ἐστί, κινεῖται δὲ τὸ ζῶον οὐκ ἐξ ἀνάγκης, οὐδ' ὁ ἄνθρωπος.

¹ τῷ ΑΒΓC : τὸ Β² diu.

² ἔστι ΑΒdu : ἔσται Cfi.

* e.g., we have in Baroco M necessarily applies to all N
M necessarily does not apply to some O.

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necessary conclusion. And if the conclusion is necessarily true of the selected examples, then it will be necessarily true of some of the original term, since that is identical with the selected example.^a Each of these syllogisms is effected in its own figure.^b

IX. It sometimes happens that we get an apodeictic syllogism even when only one of the premisses —not either of the two indifferently, but the major premiss—is apodeictic: *e.g.*, if A has been taken as necessarily applying or not applying to B, and B as simply applying to C. If the premisses are taken in this way A will necessarily apply (or not apply) to C. For since A necessarily applies (or does not apply) to all B, and C is some B, obviously A must also apply (or not apply) to C.^c

An apodeictic major premiss sometimes gives an apodeictic conclusion even if the minor premiss is assertoric. First figure. (a) Universal syllogisms.

If, however, the premiss AB is not apodeictic, but BC is, the conclusion will not be apodeictic. If it is, it must follow, both by the first and by the third figure, that A applies to some B. But this is false; for B may be such that it is possible for A to apply to no B. Further, it is also evident from a consideration of the terms that the conclusion will not be apodeictic: *e.g.*, supposing A to be 'motion,' B 'animal,' and C 'man.' Man is necessarily an animal, but the animal is not necessarily moved; nor is the man. Similarly

If we take part of O, P, such that M necessarily applies to no P, and substitute this for the minor premiss, we can infer that N necessarily applies to no P; *i.e.*, necessarily does not apply to some O. Similarly with Bocardo.

^b Baroco by Camestres, and Bocardo by Felapton.

^c The argument is fallacious, and Bekker's defence of it (*A.T.M.* p. 39) depends upon a symbolism which obscures the real issue. The relation of A to C cannot be apodeictic unless C is *necessarily* 'some B.' Aristotle does not distinguish clearly between assertoric and apodeictic relations; *cf.* *Introd.* p. 190.

80 a

ὁμοίως δὲ καὶ εἰ στερητικὸν εἶη τὸ AB· ἡ γὰρ αὐτὴ ἀπόδειξις.

Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν, εἰ μὲν τὸ
 8 καθόλου ἐστὶν ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται
 ἀναγκαῖον, εἰ δὲ τὸ κατὰ μέρος, οὐκ ἀναγκαῖον,
 οὔτε στερητικῆς οὔτε κατηγορικῆς οὔσης τῆς
 καθόλου προτάσεως. ἔστω δὴ πρῶτον τὸ καθόλου
 ἀναγκαῖον, καὶ τὸ μὲν A παντὶ τῷ B ὑπαρχέτω ἐξ
 ἀνάγκης, τὸ δὲ B τινὶ τῷ Γ ὑπαρχέτω μόνον.
 40 ἀνάγκη δὴ τὸ A τινὶ τῷ Γ ὑπάρχειν ἐξ ἀνάγκης·
 τὸ γὰρ Γ ὑπὸ τὸ B ἐστί, τῷ δὲ B παντὶ τὸ A¹
 80 b ὑπῆρχεν ἐξ ἀνάγκης. ὁμοίως δὲ καὶ εἰ στερητικὸς
 εἶη ὁ συλλογισμὸς· ἡ γὰρ αὐτὴ ἔσται ἀπόδειξις.
 εἰ δὲ τὸ κατὰ μέρος ἐστὶν ἀναγκαῖον, οὐκ ἔσται τὸ
 συμπέρασμα ἀναγκαῖον· οὐδὲν γὰρ ἀδύνατον συμ-
 6 πίπτει, καθάπερ οὐδ' ἐν τοῖς καθόλου συλλογισμοῖς.
 ὁμοίως δὲ καὶ τῶν στερητικῶν. ὅροι κίνησις—
 ζῶον—λευκόν.

X. Ἐπὶ δὲ τοῦ δευτέρου σχήματος, εἰ μὲν ἡ
 στερητικὴ πρότασις ἐστὶν ἀναγκαία, καὶ τὸ συμ-
 πέρασμα ἔσται ἀναγκαῖον, εἰ δ' ἡ κατηγορικὴ, οὐκ
 10 ἀναγκαῖον. ἔστω γὰρ πρῶτον ἡ στερητικὴ ἀναγ-
 καία, καὶ τὸ A τῷ μὲν B μηδενὶ ἐνδεχέσθω, τῷ
 δὲ Γ ὑπαρχέτω μόνον. ἐπεὶ οὖν ἀντιστρέφει τὸ
 στερητικόν, οὐδὲ τὸ B τῷ A οὐδενὶ ἐνδέχεται·
 τὸ δὲ A παντὶ τῷ Γ ὑπάρχει, ὥστ' οὐδενὶ τῷ Γ τὸ
 B ἐνδέχεται· τὸ γὰρ Γ ὑπὸ τὸ A ἐστίν. ὡσαύτως
 δὲ καὶ εἰ πρὸς τῷ Γ τεθείη² τὸ στερητικόν· εἰ γὰρ
 15 τὸ A μηδενὶ τῷ Γ ἐνδέχεται, οὐδὲ τὸ Γ οὐδενὶ τῷ
 A ἐγχωρεῖ· τὸ δὲ A παντὶ τῷ B ὑπάρχει, ὥστ'

¹ τὸ A om. B, Waitz: habent post ἀνάγκης dfu.

² τεθείη Alexander, Philoponus, Themistius: τεθῆ codd.

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also if the premiss AB is negative, for the proof is the same.

In particular syllogisms, if the universal premiss is apodeictic, the conclusion will also be apodeictic ; but if it is the particular premiss that is apodeictic, the conclusion is not apodeictic, whether the universal premiss is negative or affirmative. Let us first take the universal premiss as apodeictic, and let A necessarily apply to all B, and B simply apply to some C. Then it must follow that A necessarily applies to some C. For C falls under B,^a and *ex hypothesi* A applies necessarily to all B. Similarly too if the syllogism is negative ; for the proof will be the same. But if the particular premiss is apodeictic, the conclusion will not be apodeictic ; for there is no impossibility involved (if it is not true), just as there was none in the universal syllogisms. Similarly too in the case of negative premisses.^b Examples of terms are motion—animal—white.

X. In the second figure, if the negative premiss is apodeictic, the conclusion will also be apodeictic ; but not if the affirmative premiss is apodeictic. First let the negative premiss be apodeictic, and let it be impossible for A to apply to any B, but let it simply apply to C. Then since the negative premiss is convertible, it is also impossible for B to apply to any A. But A applies to all C. Therefore B cannot apply to any C ; for C falls under A.^c The same also holds good if the negative statement refers to C. For if A cannot apply to any C, neither can C apply to any A. But A applies to all B. Therefore C cannot

(b)
Particular
syllogisms.

Second
figure.
(a)
Universal
syllogisms

^a Cf. 26 a 22 note ; and for the fallacy see note on 30 a 15-23.

^b i.e. when one of the premisses is negative.

^c Cf. notes on 26 a 22, 30 a 15-23.

80 b

οὐδενὶ τῶν Β τὸ Γ ἐνδέχεται· γίνεται γὰρ το
 πρῶτον σχῆμα πάλιν. οὐκ ἄρα οὐδὲ τὸ Β τῷ Γ·
 ἀντιστρέφει γὰρ ὁμοίως.

- Εἰ δ' ἡ κατηγορική πρότασις ἐστὶν ἀναγκαία, οὐκ
 20 ἔσται τὸ συμπέρασμα ἀναγκαῖον. ὑπαρχέτω γὰρ
 τὸ Α παιτὶ τῷ Β ἐξ ἀνάγκης, τῷ δὲ Γ μηδενὶ
 ὑπαρχέτω μόνον. ἀντιστραφέϊτος οὖν τοῦ στερη-
 τικοῦ τὸ πρῶτον γίνεται σχῆμα· δέδεικται δ' ἐν
 τῷ πρώτῳ ὅτι μὴ ἀναγκαίως οὔσης τῆς πρὸς τὸ
 μείζον στερητικῆς οὐδὲ τὸ συμπέρασμα ἔσται
 ἀναγκαῖον, ὥστ' οὐδ' ἐπὶ τούτων ἔσται ἐξ ἀνάγκης.
 25 Ἔτι δ' εἰ τὸ συμπέρασμα ἐστὶν ἀναγκαῖον,
 συμβαίνει τὸ Γ τινὶ τῷ Α μὴ ὑπάρχειν ἐξ ἀνάγκης·
 εἰ γὰρ τὸ Β τῷ Γ μηδενὶ ὑπάρχει ἐξ ἀνάγκης, οὐδὲ
 τὸ Γ τῷ Β οὐδενὶ ὑπάρξει ἐξ ἀνάγκης· τὸ δέ γε
 Β τινὶ τῷ Α ἀνάγκη ὑπάρχειν, εἴπερ καὶ τὸ Α
 παιτὶ τῷ Β ἐξ ἀνάγκης ὑπῆρχεν, ὥστε τὸ Γ ἀνάγκη
 30 τινὶ τῷ Α μὴ ὑπάρχειν. ἀλλ' οὐδὲν κωλύει τὸ Α
 τοιοῦτον ληφθῆναι ὥ παιτὶ τὸ Γ ἐνδέχεται ὑπ-
 ἄρχειν.

- Ἔτι κὰν ὅρους ἐκθέμενον εἴη δεῖξαι ὅτι τὸ συμ-
 πέρασμα οὐκ ἔστιν ἀναγκαῖον ἀπλῶς, ἀλλὰ τούτων
 ὄντων ἀναγκαῖον. οἷον ἔστω τὸ Α ζῶον, τὸ δὲ
 Β ἄνθρωπος, τὸ δὲ Γ λευκόν, καὶ αἱ προτάσεις
 85 ὁμοίως εἰλήφθωσαν· ἐνδέχεται γὰρ τὸ ζῶον μηδενὶ
 λευκῷ ὑπάρχειν. οὐχ ὑπάρξει δὴ οὐδ' ὁ ἄνθρωπος
 οὐδενὶ λευκῷ, ἀλλ' οὐκ ἐξ ἀνάγκης· ἐνδέχεται γὰρ
 ἄνθρωπον γενέσθαι λευκόν, οὐ μέντοι ἕως ἂν ζῶον
 μηδενὶ λευκῷ ὑπάρχη. ὥστε τούτων μὲν ὄντων
 ἀναγκαῖον ἔσται τὸ συμπέρασμα, ἀπλῶς δ' οὐκ
 ἀναγκαῖον.

- 81 a Ὅμοίως δ' ἔξει καὶ ἐπὶ τῶν ἐν μέρει συλλογι-

apply to any B, for we get the first figure again ; and so neither can B apply to C, for the premiss is convertible as before.

But if the affirmative premiss is apodeictic, the conclusion will not be apodeictic. (1) Let A necessarily apply to all B, and let it merely apply to no C. Then by the conversion of the negative statement we get the first figure ; and it has been proved^a in the first figure that if the negative major premiss is not apodeictic, the conclusion will not be apodeictic either. Therefore it will not be apodeictic in the present example.

(2) Further, if the conclusion is apodeictic, it follows that C necessarily does not apply to some A. For if B necessarily applies to no C, C will also necessarily apply to no B. But B must apply to some A, that is if A *ex hypothesi* must apply to all B. Therefore C necessarily does not apply to some A. There is, however, no reason why A should not be so taken that C may possibly apply to all of it.

(3) Further, it can be shown by taking examples of terms that the conclusion is necessary, not absolutely, but given certain conditions. *E.g.*, let A be 'animal,' B 'man,' and C 'white' ; and let the premisses be taken in the same way as before^b ; for it is possible that 'animal' should apply to nothing that is white. Then 'man' too will apply to nothing that is white. But this will not be so of necessity, for a white man may come into being, but not so long as 'animal' applies to nothing that is white. Thus given these conditions the conclusion will be necessary ; but it will not be absolutely necessary.

The same principle will obtain in the case of

^a 30 a 23 ff.

^b In 30 b 20.

31 a

σμῶν. ὅταν μὲν γὰρ ἡ στερητικὴ πρότασις καθόλου
 τ' ἢ καὶ ἀναγκαία, καὶ τὸ συμπέρασμα ἔσται
 ἀναγκαῖον· ὅταν δὲ ἡ κατηγορικὴ καθόλου ἡ δὲ
 5 στερητικὴ κατὰ μέρος, οὐκ ἔσται τὸ συμπέρασμα
 ἀναγκαῖον. ἔστω δὴ πρῶτον ἡ στερητικὴ καθόλου
 τε καὶ ἀναγκαία, καὶ τὸ Α τῷ μὲν Β μηδενὶ ἐν-
 δεχέσθω ὑπάρχειν, τῷ δὲ Γ τινὶ ὑπαρχέτω· ἐπεὶ
 οὖν ἀντιστρέφει τὸ στερητικόν, οὐδὲ τὸ Β τῷ Α
 οὐδενὶ ἐνδέχοιτ' ἂν ὑπάρχειν· τὸ δέ γε Α τινὶ τῷ Γ
 10 ὑπάρχει· ὥστ' ἐξ ἀνάγκης τινὶ τῶν Γ οὐχ ὑπάρξει·
 τὸ Β. πάλιν ἔστω ἡ κατηγορικὴ καθόλου τε καὶ
 ἀναγκαία, καὶ κείσθω πρὸς τῷ Β τὸ κατηγορικόν·
 εἰ δὴ τὸ Α παντὶ τῷ Β ἐξ ἀνάγκης ὑπάρχει τῷ δὲ
 Γ τινὶ μὴ ὑπάρχει, ὅτι μὲν οὐχ ὑπάρξει τὸ Β τινὶ
 τῷ Γ, φανερόν, ἀλλ' οὐκ ἐξ ἀνάγκης· οἱ γὰρ αὐτοὶ
 15 ὅροι ἔσονται πρὸς τὴν ἀπόδειξιν οἵπερ ἐπὶ τῶν
 καθόλου συλλογισμῶν.

Ἄλλ' οὐδ' εἰ τὸ στερητικὸν ἀναγκαῖον ἐστὶν ἐν
 μέρει ληφθέν, οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον·
 διὰ γὰρ τῶν αὐτῶν ὁρων ἡ ἀπόδειξις.

XI. Ἐν δὲ τῷ τελευταίῳ σχήματι καθόλου μὲν
 ὄντων τῶν ὁρων πρὸς τὸ μέσον καὶ κατηγορικῶν
 20 ἀμφοτέρων τῶν προτάσεων, ἐὰν ὁποτερονοῦν ἡ
 ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται ἀναγκαῖον·
 ἐὰν δὲ τὸ μὲν ἢ στερητικόν τὸ δὲ κατηγορικόν,
 ὅταν μὲν τὸ στερητικὸν ἀναγκαῖον ἢ, καὶ τὸ
 συμπέρασμα ἔσται ἀναγκαῖον, ὅταν δὲ τὸ κατ-
 ηγορικόν, οὐκ ἔσται ἀναγκαῖον.

Ἔστωσαν γὰρ ἀμφότεραι κατηγορικαὶ πρῶτον αἱ
 25 προτάσεις, καὶ τὸ Α καὶ τὸ Β παντὶ τῷ Γ ὑπαρχέτω,
 ἀναγκαῖον δ' ἔστω τὸ ΑΓ. ἐπεὶ οὖν τὸ Β παντὶ

¹ ὑπάρχει Α.

particular syllogisms. When the negative premiss ^(b) is universal and apodeictic, the conclusion will also ^{Particular syllogisms.} be apodeictic; but when the affirmative premiss is universal and the negative particular, the conclusion will not be apodeictic. First let the negative premiss be universal and necessary, and let it be impossible for A to apply to any B, but let A apply to some C. Then since the negative premiss is convertible, it is also impossible for B to apply to any A. But A applies to some C, and so B will necessarily not apply to some C.^a Again, let the affirmative premiss be universal and apodeictic, and let the affirmative premiss refer to B. Then if A necessarily applies to all B, and does not apply to some C, evidently B will not apply to some C; but this will not be so of necessity. The terms to demonstrate this will be the same as in the universal syllogisms.^b

Nor will the conclusion be apodeictic if the negative statement is apodeictic and particular. This may be demonstrated by means of the same terms.

XI. In the last figure, where the <extreme> terms ^{Third figure.} are in a universal relation to the middle, and both ^(a) premisses are affirmative, if either statement is ^{Universal syllogisms.} apodeictic, the conclusion will also be apodeictic. If, however, one is negative and the other affirmative, when the negative is apodeictic, the conclusion will also be apodeictic^c; but when the affirmative is apodeictic, the conclusion will not be apodeictic.

First let both premisses be affirmative, and let both A and B apply to all C, and let the premiss AC be apodeictic. Then since B applies to all C, C will also

^a The proof breaks down, being dependent upon the syllogism in 30 a 21-23. ^b 30 b 33.

^c Actually none of these conclusions can be apodeictic; cf. 30 a 23 note.

31 a

τῷ Γ ὑπάρχει, καὶ τὸ Γ τινὶ τῷ Β ὑπάρξει διὰ τὸ ἀντιστρέφειν τὸ καθόλου τῷ κατὰ μέρος· ὥστ' εἰ παντὶ τῷ Γ τὸ Α ἐξ ἀνάγκης ὑπάρχει καὶ τὸ Γ
 30 τῷ Β τινί, καὶ τῷ Β τινὶ ἀναγκαῖον ὑπάρχειν τὸ Α· τὸ γὰρ Β ὑπὸ τὸ Γ ἔστιν. γίνεται οὖν τὸ πρῶτον σχῆμα. ὁμοίως δὲ δειχθήσεται καὶ εἰ τὸ ΒΓ ἔστιν ἀναγκαῖον· ἀντιστρέφει γὰρ τὸ Γ τῷ Α τινί, ὥστ' εἰ παντὶ τῷ Γ τὸ Β ἐξ ἀνάγκης ὑπάρχει, καὶ τῷ Α τινὶ ὑπάρξει ἐξ ἀνάγκης.

Πάλιν ἔστω τὸ μὲν ΑΓ στερητικόν, τὸ δὲ ΒΓ
 35 καταφατικόν, ἀναγκαῖον δὲ τὸ στερητικόν. ἐπεὶ οὖν ἀντιστρέφει τινὶ τῷ Β τὸ Γ, τὸ δὲ Α οὐδενὶ τῷ Γ ἐξ ἀνάγκης, οὐδὲ τῷ Β τινὶ ὑπάρξει ἐξ ἀνάγκης τὸ Α· τὸ γὰρ Β ὑπὸ τὸ Γ ἔστιν. εἰ δὲ τὸ κατηγορικὸν ἀναγκαῖον, οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον. ἔστω γὰρ τὸ ΒΓ κατηγορικόν καὶ
 40 ἀναγκαῖον, τὸ δὲ ΑΓ στερητικόν καὶ μὴ ἀναγκαῖον. ἐπεὶ οὖν ἀντιστρέφει τὸ καταφατικόν, ὑπάρξει καὶ τὸ Γ τινὶ τῷ Β ἐξ ἀνάγκης, ὥστ' εἰ τὸ μὲν Α
 31 b μὴδενὶ τῶν Γ τὸ δὲ Γ τινὶ τῶν Β, τὸ Α τινὶ τῶν Β οὐχ ὑπάρξει· ἀλλ' οὐκ ἐξ ἀνάγκης· δέδεικται γὰρ ἐν τῷ πρώτῳ σχήματι ὅτι τῆς στερητικῆς προτάσεως μὴ ἀναγκαίᾳς οὕσης οὐδὲ τὸ συμπέρασμα ἔσται ἀναγκαῖον.

Ἔτι καὶ διὰ τῶν ὁρων εἴη φανερόν. ἔστω γὰρ
 5 τὸ μὲν Α ἀγαθόν, τὸ δ' ἐφ' ᾧ Β ζῶον, τὸ δὲ Γ ἵππος. τὸ μὲν οὖν ἀγαθὸν ἐνδέχεται μὴδενὶ ἵππῳ ὑπάρχειν, τὸ δὲ ζῶον ἀνάγκη παντὶ ὑπάρχειν· ἀλλ' οὐκ ἀνάγκη ζῶόν τι μὴ εἶναι ἀγαθόν, εἴπερ ἐνδέχεται πᾶν εἶναι ἀγαθόν. ἢ εἰ μὴ τοῦτο δυνατόν, ἀλλὰ τὸ ἐργηγορέναι ἢ καθεύδειν ὅρον θετέον· ἅπαν
 10 γὰρ ζῶον δεκτικὸν τούτων.

apply to some B (because the universal converts with the particular); so that if A must apply to all C, and C applies to some B, A must also apply to some B; for B falls under C. Thus we get the first figure. The proof will be similar also if the premiss BC is apodeictic; for by conversion C applies to some A, so that if B necessarily applies to all C, it will also necessarily apply to some A.

Again, let AC be negative and BC affirmative, and let the negative premiss be apodeictic. Then since by conversion C applies to some B, and A necessarily applies to no C, A will also necessarily not apply to some B; for B falls under C. But if it is the affirmative premiss that is apodeictic, the conclusion will not be apodeictic. Let BC be affirmative and apodeictic, and AC be negative and assertoric. Then since the affirmative premiss is convertible, C will also necessarily apply to some B; so that if A applies to no C and C (necessarily) applies to some B, A will not apply to some B. But this will not be so of necessity; for it has been proved^a in the first figure that if the negative premiss is not apodeictic neither will the conclusion be apodeictic.

Further, this fact can be clearly shown by taking examples of terms. Let A be 'good,' B 'animal,' and C 'horse.' Then 'good' may apply to no horse, but 'animal' must apply to every horse. But it is not necessary that some animal should not be good, since every animal may be good. Or if this is not possible, let the term be taken as 'waking' or 'sleeping'; for every animal is receptive of these states.

^a The reference is presumably to 30 a 32.

Εἰ μὲν οὖν οἱ ὅροι καθόλου πρὸς τὸ μέσον εἰσίν, εἴρηται πότε ἔσται τὸ συμπέρασμα ἀναγκαῖον· εἰ δ' ὁ μὲν καθόλου ὁ δ' ἐν μέρει, κατηγορικῶν μὲν ὄντων ἀμφοτέρων, ὅταν τὸ καθόλου γένηται ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται ἀναγκαῖον. ἀποδειξίς δ' ἡ αὐτὴ ἢ καὶ πρότερον· ἀντιστρέφει γὰρ καὶ τὸ ἐν μέρει κατηγορικόν. εἰ οὖν ἀνάγκη τὸ Β παιτὶ τῷ Γ ὑπάρχειν, τὸ δὲ Α ὑπὸ τὸ Γ ἐστίν, ἀνάγκη τὸ Β τινὶ τῷ Α ὑπάρχειν· εἰ δὲ τὸ Β τῷ Α τινί, καὶ τὸ Α τῷ Β τινὶ ὑπάρχειν ἀναγκαῖον· ἀντιστρέφει γάρ. ὁμοίως δὲ καὶ εἰ τὸ ΑΓ εἴη ἀναγκαῖον καθόλου ὄν· τὸ γὰρ Β ὑπὸ τὸ Γ ἐστίν.

Εἰ δὲ τὸ ἐν μέρει ἐστίν ἀναγκαῖον, οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον. ἔστω γὰρ τὸ ΒΓ ἐν μέρει τε καὶ ἀναγκαῖον, τὸ δὲ Α παντὶ τῷ Γ ὑπαρχέτω, μὴ μέντοι ἐξ ἀνάγκης· ἀντιστραφέντος οὖν τοῦ ΒΓ τὸ πρῶτον γίγνεται σχῆμα, καὶ ἡ μὲν καθόλου πρότασις οὐκ ἀναγκαία, ἢ δ' ἐν μέρει ἀναγκαία. ὅτε δ' οὕτως ἔχοιεν αἱ προτάσεις, οὐκ ἦν τὸ συμπέρασμα ἀναγκαῖον· ὥστ' οὐδ' ἐπὶ τούτων. ἔτι δὲ καὶ ἐκ τῶν ὅρων φανερόν. ἔστω γὰρ τὸ μὲν Α ἐγγήγορσις, τὸ δὲ Β δίπουν, ἐφ' ᾧ δὲ τὸ Γ ζῶον· τὸ μὲν οὖν Β τινὶ τῷ Γ ἀνάγκη ὑπάρχειν, τὸ δὲ Α τῷ Γ ἐνδέχεται, καὶ τὸ Α τῷ Β οὐκ ἀναγκαῖον· οὐ γὰρ ἀνάγκη δίπουν τι καθεύδειν ἢ ἐγγρηγορέναι. ὁμοίως δὲ καὶ διὰ τῶν αὐτῶν ὅρων δειχθήσεται καὶ εἰ τὸ ΑΓ εἴη ἐν μέρει τε καὶ ἀναγκαῖον.

Εἰ δ' ὁ μὲν κατηγορικός ὁ δὲ στερητικός τῶν

* 31 a 24 ff.; it is of course equally invalid.

† i.e. C applies to all A; which by conversion gives the relation 'A applies to some C.'

Thus we have stated in what circumstances the conclusion will be apodeictic if the extreme terms are in a universal relation to the middle. But if one term is in a universal and the other in a particular relation, both premisses being affirmative, when the universal relation is apodeictic, the conclusion will also be apodeictic. The proof is the same as before ^a; for the affirmative particular premiss is also convertible. Thus if B must apply to all C, and A falls under C,^b B must apply to some A. And if B must apply to some A, A must also apply to some B; for the premiss is convertible. Similarly too supposing that the premiss AC is apodeictic and universal; for B falls under C.^c

(b)
Particular
syllogisms.

If, however, it is the particular premiss that is apodeictic, the conclusion will not be apodeictic. Let BC be particular and apodeictic, and let A apply to all C, but not of necessity. Then by the conversion of BC we get the first figure, and the universal premiss is not apodeictic, but the particular is. Now we saw ^d that whenever the premisses are thus related the conclusion is not apodeictic; and so neither will it be so in the present case. Further, this fact can be clearly shown by taking examples of terms. Let A be 'waking,' and B 'biped,' and C 'animal.' Then B must apply to some C, and A may apply to C, but A does not necessarily apply to B; for it is not necessary that a particular biped should be asleep or awake. The proof can be effected similarly by means of the same terms supposing AC to be particular and apodeictic.

If, however, one of the terms is positive and the

^c Cf. previous note.

^d 30 a 35, b 1 ff.

- 31^b ὄρων, ὅταν μὲν ἢ τὸ καθόλου στερητικὸν τε καὶ
 35 ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται ἀναγκαῖον·
 εἰ γὰρ τὸ Α τῷ Γ μηδενὶ ἐνδέχεται, τὸ δὲ Β τινὶ
 τῷ Γ ὑπάρχει, τὸ Α τινὶ τῷ Β ἀνάγκη μὴ ὑπάρχειν.
 ὅταν δὲ τὸ καταφατικὸν ἀναγκαῖον τεθῇ, ἡ καθόλου
 ὄν ἢ ἐν μέρει, ἡ τὸ στερητικὸν κατὰ μέρος, οὐκ
 ἔσται τὸ συμπέρασμα ἀναγκαῖον. τὰ μὲν γὰρ ἄλλα
 40 ταῦτά ᾗ καὶ ἐπὶ τῶν προτέρων ἐρουῦμεν, ὅροι δ'
 ὅταν μὲν ἢ τὸ καθόλου κατηγορικὸν ἀναγκαῖον,
 32^a ἐγρήγορσις—ζῶον—ἄνθρωπος, μέσον ἄνθρωπος,
 ὅταν δ' ἐν μέρει τὸ κατηγορικὸν ἀναγκαῖον, ἐγρή-
 γορσις—ζῶον—λευκόν (ζῶον μὲν γὰρ ἀνάγκη τινὶ
 λευκῷ ὑπάρχειν, ἐγρήγορσις δ' ἐνδέχεται μηδενί,
 καὶ οὐκ ἀνάγκη τινὶ ζῳῷ μὴ ὑπάρχειν ἐγρήγορσιν),
 5 ὅταν δὲ τὸ στερητικὸν ἐν μέρει ὄν ἀναγκαῖον ἢ,
 δίπουν—κινούμενον—ζῶον, ζῶον μέσον.¹

XII. Φανερόν οὖν ὅτι τοῦ μὲν ὑπάρχειν οὐκ ἔστι
 συλλογισμὸς εἰ μὴ ἀμφοτέραι ὦσιν αἱ προτάσεις
 ἐν τῷ ὑπάρχειν, τοῦ δ' ἀναγκαίου ἔστι καὶ τῆς
 ἐτέρας μόνον ἀναγκαίας οὔσης. ἐν ἀμφοτέροις δέ,
 10 καὶ καταφατικῶν καὶ στερητικῶν ὄντων τῶν συλ-
 λογισμῶν, ἀνάγκη τὴν ἐτέραν πρότασιν ὁμοίαν
 εἶναι τῷ συμπεράσματι (λέγω δὲ τὸ ὁμοίαν, εἰ μὲν
 ὑπάρχον, ὑπάρχουσαν, εἰ δ' ἀναγκαῖον, ἀναγκαίαν).
 ὥστε καὶ τοῦτο δῆλον, ὅτι οὐκ ἔσται τὸ συμ-
 πέρασμα οὔτ' ἀναγκαῖον οὔθ' ὑπάρχον εἶναι μὴ
 ληφθείσης ἀναγκαίας ἢ ὑπαρχούσης προτάσεως.

- 15 Περὶ μὲν οὖν τοῦ ἀναγκαίου, πῶς γίνεταί καὶ

¹ ζῶον μέσον d², Waitz, ita (sed ζῶον in litura) B: δίπουν, μέσον ζῶον Ad¹: δίπουν μέσον n: μέσον ζῶον C, Bekker: om. u.

• Cf. 31 a 37 ff., b 20 ff.

other negative, when the universal premiss is negative and apodeictic, the conclusion will also be apodeictic ; for if it is impossible for A to apply to any C, and B applies to some C, A necessarily does not apply to some B. But when the affirmative premiss, whether universal or particular, or the negative particular premiss, is apodeictic, the conclusion will not be apodeictic. The rest of the proof will be the same as before,^a and the terms will be (1) when the universal affirmative premiss is apodeictic, waking—animal—man (man being the middle term) ; (2) when the affirmative apodeictic premiss is particular, waking—animal—white (for ‘ animal ’ must apply to something white, but ‘ waking ’ may apply to nothing white, and it is not necessary that ‘ waking ’ should not apply to some particular animal) ; (3) when the negative particular premiss is apodeictic, biped—moving—animal (animal being the middle term).

XII. It is evident, then, that whereas there is no assertoric syllogism unless both premisses are in the assertoric mode, there is an apodeictic syllogism even if only one of the premisses is apodeictic.^b But in both cases, whether the syllogisms are affirmative or negative, one of the premisses must be similar to the conclusion. By ‘ similar ’ I mean that if the conclusion is assertoric the premiss must be assertoric, and if the conclusion is apodeictic the premiss must be apodeictic. Hence this also is clear : that it will not be possible for the conclusion to be either apodeictic or assertoric unless a premiss is taken as apodeictic or assertoric.

With regard, then, to the apodeictic mode of syllogism, how it is obtained and in what respect it

Deductions
from the
foregoing
analysis.

Problematic
syllogisms.

^b On this fallacy see 30 a 23 note.

32 a

- τίνα διαφορὰν ἔχει πρὸς τὸ ὑπάρχον, εἴρηται
 σχεδὸν ἱκανῶς. XIII. περὶ δὲ τοῦ ἐνδεχομένου
 μετὰ ταῦτα λέγομεν πότε καὶ πῶς καὶ διὰ τίνων
 ἔσται συλλογισμός. λέγω δ' ἐνδέχεσθαι καὶ τὸ
 ἐνδεχόμενον, οὐ μὴ οἷτος ἀναγκαῖον τεθέντος δ'
 20 ὑπάρχειν, οὐδὲν ἔσται διὰ τοῦτ' ἀδύνατον (τὸ γὰρ
 ἀναγκαῖον ὁμωνύμως ἐνδέχεσθαι λέγομεν). ὅτι δὲ
 τοῦτ' ἐστὶ τὸ ἐνδεχόμενον, φανερόν ἐκ τε τῶν ἀπο-
 φάσεων καὶ τῶν καταφάσεων τῶν ἀντικειμένων·
 τὸ γὰρ οὐκ ἐνδέχεται ὑπάρχειν καὶ ἀδύνατον
 ὑπάρχειν καὶ ἀνάγκη μὴ ὑπάρχειν ἥτοι ταῦτά ἐστιν
 25 ἢ ἀκολουθεῖ ἀλλήλοις, ὥστε καὶ τὰ ἀντικείμενα
 τούτοις, τὸ ἐνδέχεται ὑπάρχειν καὶ οὐκ ἀδύνατον
 ὑπάρχειν καὶ οὐκ ἀνάγκη μὴ ὑπάρχειν, ἥτοι ταῦτά
 ἔσται ἢ ἀκολουθοῦντα ἀλλήλοις· κατὰ παντός γὰρ
 ἢ φάσις¹ ἢ ἡ ἀπόφασίς ἐστίν. ἔσται ἄρα τὸ ἐν-
 δεχόμενον οὐκ ἀναγκαῖον καὶ τὸ μὴ ἀναγκαῖον
 ἐνδεχόμενον.
- 80 Συμβαίνει δὲ πάσας τὰς κατὰ τὸ ἐνδέχεσθαι
 προτάσεις ἀντιστρέφειν ἀλλήλαις. λέγω δὲ οὐ τὰς
 καταφατικὰς ταῖς ἀποφατικαῖς, ἀλλ' ὅσαι κατα-
 φατικὸν ἔχουσι τὸ σχῆμα κατὰ τὴν ἀντίθεσιν, οἷον
 τὸ ἐνδέχεσθαι ὑπάρχειν τῷ ἐνδέχεσθαι μὴ ὑπάρχειν,
 καὶ τὸ παιτὶ ἐνδέχεσθαι τῷ ἐνδέχεσθαι μηδενὶ καὶ
 85 μὴ παντί, καὶ τὸ τινὶ τῷ μὴ τινί· τὸν αὐτὸν δὲ
 τρόπον καὶ ἐπὶ τῶν ἄλλων. ἐπεὶ γὰρ τὸ ἐνδεχό-

¹ φάσις AB: κατάφασις.

* Cf. 25 a 37.

^b This is not proved by the preceding argument. It is indeed implied there that unless ἀναγκαῖον ὑπάρχειν = οὐκ ἀναγκαῖον μὴ ὑπάρχειν it cannot be equivalent to ἐνδεχόμενον ὑπάρχειν. But one would expect explicit proof of so important a point, and I am therefore disposed to agree with Becker

differs from the assertoric, we have given, broadly speaking, a sufficient account. XIII. Next we shall state with regard to the possible, when and in what sense and by what means we shall get a syllogism. I call a thing possible if when, not being necessary, it is assumed to be true, no impossibility will thereby be involved. (‘I say ‘not being necessary’ because we apply the term ‘possible’ equivocally to that which is necessary.’^a) That this is the meaning of the expression ‘to be possible’ is evident if we consider the contradictory negations and affirmations. For ‘it is not possible that it should apply’ and ‘it cannot apply’ and ‘it is necessary that it should not apply’ are either the same or imply one another; and so their contradictories, ‘it is possible that it should apply’ and ‘it can apply’ and ‘it is not necessary that it should not apply’ are either the same or imply one another; for either the assertion or the negation is predicated of every subject. That which is possible, then, will not be necessary; and that which is not necessary will be possible.^b

It follows that all problematic premisses are convertible with one another. I mean, not that the affirmative are convertible with the negative, but that all which have an affirmative form are convertible with their opposites: e.g., ‘to be possible to apply’ with ‘to be possible not to apply’ and ‘to be possible to apply to all’ with ‘to be possible to apply to none’ or ‘not to apply to all’; and ‘to be possible to apply to some’ with ‘to be possible not to apply to some’; and similarly in the remaining cases. For

(*A.T.M.* 11-13) that the ‘argument’ is the addition of a well-meaning pupil. Maier (*Syllogistik des Aristoteles*, II. i. 139-140) seems to evade the difficulty.

82 a

μενον οὐκ ἔστιν ἀναγκαῖον, τὸ δὲ μὴ ἀναγκαῖον ἐγχωρεῖ μὴ ὑπάρχειν, φανερόν ὅτι εἰ ἐνδέχεται τὸ Α τῷ Β ὑπάρχειν, ἐνδέχεται καὶ μὴ ὑπάρχειν· καὶ
 40 εἰ παντὶ ἐνδέχεται ὑπάρχειν, καὶ παντὶ ἐνδέχεται
 82 b μὴ ὑπάρχειν. ὁμοίως δὲ καὶ τῶν ἐν μέρει καταφάσεων· ἡ γὰρ αὕτη ἀπόδειξις. εἰσὶ δ' αἱ τοιαῦται προτάσεις κατηγορικαὶ καὶ οὐ στερητικαί· τὸ γὰρ ἐνδέχεσθαι τῷ εἶναι ὁμοίως τάττεται, καθάπερ ἐλέχθη πρότερον.

- 5 Διωρισμένων δὲ τούτων πάλιν λέγομεν ὅτι τὸ ἐνδέχεσθαι κατὰ δύο λέγεται τρόπους, ἓνα μὲν τὸ ὡς ἐπὶ τὸ πολὺ γίνεσθαι καὶ διαλείπειν τὸ ἀναγκαῖον, οἷον τὸ πολιοῦσθαι ἄνθρωπον ἢ τὸ αὐξάνεσθαι ἢ φθίνειν, ἢ ὅλως τὸ πεφυκὸς ὑπάρχειν (τοῦτο γὰρ οὐ συνεχές μὲν ἔχει τὸ ἀναγκαῖον διὰ
 10 τὸ μὴ αἰεὶ εἶναι ἄνθρωπον, ὅντος μέντοι ἀνθρώπου ἢ ἐξ ἀνάγκης ἢ ὡς ἐπὶ τὸ πολὺ ἔστιν), ἄλλον δὲ τὸ ἀόριστον, ὃ καὶ οὕτως καὶ μὴ οὕτως δυνατόν, οἷον τὸ βαδίζειν ζῶον ἢ τὸ βαδίζοντος γενέσθαι σεισμόν, ἢ ὅλως τὸ ἀπὸ τύχης γιγνόμενον· οὐδὲν γὰρ μᾶλλον
 15 οὕτως πέφυκεν ἢ ἐναντίως. ἀντιστρέφει μὲν οὖν καὶ κατὰ τὰς ἀντικειμένας προτάσεις ἐκάτερον τῶν ἐνδεχομένων, οὐ μὲν τὸν αὐτὸν γε τρόπον, ἀλλὰ τὸ μὲν πεφυκὸς εἶναι τῷ μὴ ἐξ ἀνάγκης ὑπάρχειν (οὕτω γὰρ ἐνδέχεται μὴ πολιοῦσθαι ἄνθρωπον), τὸ δ' ἀόριστον τῷ μηδὲν μᾶλλον οὕτως ἢ ἐκείνως.

^a 25 b 21.

^b The distinction is not clearly expressed, and has nothing to do with necessity. In the former sense the possible is probable but not necessary, and its opposite is therefore improbable but not impossible. In the latter sense the possible is neither necessary nor more probable than its opposite. See *Introd.* p. 191.

since the possible is not necessary, and that which is not necessary may not apply, it is evident that if it is possible for A to apply to B, it is also possible for it not to apply ; and if it is possible for it to apply to all B, it is also possible for it not to apply to all. Similarly too in the case of particular affirmations ; for the same proof obtains. Such premisses are affirmative, not negative ; for the senses of ' to be possible ' correspond to those of ' to be,' as has been already stated.^a

Having made these distinctions clear, we may further remark that the expression ' to be possible ' is used in two senses : (1) to describe what generally happens but falls short of being necessary, *e.g.*, a man's becoming grey-haired or growing or wasting away, or in general that which is naturally applicable to a subject (for such an attribute has no continuous necessity, because a man does not always exist ; but so long as a man exists the attribute applies to him either of necessity or as a general rule) ; and (2) to describe the indeterminate, which is capable of happening both in a given way and otherwise : *e.g.*, the walking of an animal, or the happening of an earthquake while it is walking, or in general a chance occurrence ; for it is no more natural that such a thing should happen in one way than in the opposite way. The possible in each of these two senses, then, is convertible with its opposite premiss ; not, however, in the same way. That which is naturally so converts because it does not necessarily apply (for it is in this sense that it is possible for a man not to become grey-haired) ; but the indeterminate converts because it happens no more in one way than in another.^b

Two senses of the possible :
(1) That which happens usually but not necessarily ;

(2) That which happens or does not happen indifferently.

Ἐπιστήμη δὲ καὶ συλλογισμὸς ἀποδεικτικὸς τῶν
 μὲν ἀορίστων οὐκ ἔστι διὰ τὸ ἄτακτον εἶναι τὸ
 20 μέσον, τῶν δὲ πεφυκότεων ἔστι, καὶ σχεδὸν οἱ λόγοι
 καὶ αἱ σκέψεις γίνονται περὶ τῶν οὕτως ἐνδεχο-
 μένων· ἐκείνων δ' ἐγχαυρεῖ μὲν γενέσθαι συλ-
 λογισμὸν, οὐ μὴν εἰωθέ γε ζητεῖσθαι.

Ταῦτα μὲν οὖν διορισθήσεται μᾶλλον ἐν τοῖς
 ἐπομένοις· νῦν δὲ λέγομεν πότε καὶ τίς ἔσται
 25 συλλογισμὸς ἐκ τῶν ἐνδεχομένων προτάσεων.

Ἐπεὶ δὲ τὸ ἐνδέχεσθαι τόδε τῷδε ὑπάρχειν διχῶς
 ἔστιν ἐκλαβεῖν· ἢ γὰρ ὡς ὑπάρχει τόδε ἢ ὡς ἐνδέχεται
 αὐτὸ ὑπάρχειν (τὸ γὰρ καθ' οὗ τὸ Β τὸ Α ἐν-
 δέχεσθαι τούτων σημαίνει θάτερον, ἢ καθ' οὗ λέγε-
 ται τὸ Β ἢ καθ' οὗ ἐνδέχεται λέγεσθαι, τὸ δὲ καθ'
 30 οὗ τὸ Β τὸ Α ἐνδέχεσθαι ἢ παντὶ τῷ Β τὸ Α
 ἐγχαυρεῖν οὐδὲν διαφέρει)· φανερόν ὅτι διχῶς ἂν
 λέγοιτο τὸ Α τῷ Β παντὶ ἐνδέχεσθαι ὑπάρχειν.
 πρῶτον οὖν εἵπωμεν, εἰ καθ' οὗ τὸ Γ τὸ Β ἐν-
 δέχεται, καὶ καθ' οὗ τὸ Β τὸ Α, τίς ἔσται καὶ
 ποῖος συλλογισμὸς· οὕτω γὰρ αἱ προτάσεις ἀμφό-
 35 τεραι λαμβάνονται κατὰ τὸ ἐνδέχεσθαι, ὅταν δὲ

* The middle term is here treated as proximate cause;
 cf. *An. Post.* I. 78 b 4, II. ii., 93 a 3 ff. For the general
 sense cf. *Met.* VI. (E), ii., XI. (K), viii., *An. Post.* I. xxx.

† There is no obvious fulfilment of this promise. Jenkin-
 son refers to *An. Post.* I. viii.

PRIOR ANALYTICS, I. XIII

There is no scientific knowledge or demonstrative syllogism of indeterminate propositions, because the middle term ^a is not established ; but there are both in the case of propositions which are naturally applicable, and, speaking broadly, it is with propositions which are possible in this sense that all discussions and inquiries are concerned. There can be a syllogism of those which are possible in the other sense, but it is not usually required.

These distinctions shall receive fuller treatment later.^b Our present concern is to state in what circumstances a syllogism can be drawn from problematic premisses, and what the nature of the syllogism will be.

Since the statement that it is possible for one term to apply to another can be taken in two different senses, viz., either that it may apply to a subject to which the other term applies, or that it may apply to a subject to which the other term may apply (for the statement that A may be predicated of that of which B is predicated means one of two things : either that it may be predicated of the subject of which B is predicated, or that it may be predicated of the subject of which B may be predicated ; and the statement that A may be predicated of the subject of which B is predicated differs in no way from the statement that A may apply to all B) ; it is evident that there are two senses in which it can be said that A may apply to all B. First, then, let us state what and of what kind the syllogism will be if B may be predicated of the subject of which C may be predicated, and A may be predicated of the subject of which B may be predicated, for in this type both premisses are problematic ; but when A may be

Two senses of the statement 'A may apply to all B.'

32 b

καθ' οὐ τὸ Β ὑπάρχει τὸ Α ἐνδέχεται, ἢ μὲν ὑπάρχουσα ἢ δ' ἐνδεχομένη· ὥστ' ἀπὸ τῶν ὁμοιοσχημόνων¹ ἀρκτέον, καθάπερ καὶ ἐν τοῖς ἄλλοις.

XIV. Ὅταν οὖν τὸ Α παντὶ τῷ Β ἐνδέχεται καὶ τὸ Β παντὶ τῷ Γ, συλλογισμὸς ἔσται τέλειος ὅτι
 40 τὸ Α παντὶ τῷ Γ ἐνδέχεται ὑπάρχειν. τοῦτο δὲ
 23 α φανερόν ἐκ τοῦ ὁρισμοῦ· τὸ γὰρ ἐνδέχεσθαι παντὶ ὑπάρχειν οὕτως ἐλέγομεν. ὁμοίως δὲ καὶ εἰ τὸ μὲν Α ἐνδέχεται μηδενὶ τῷ Β τὸ δὲ Β παντὶ τῷ Γ, ὅτι τὸ Α ἐνδέχεται μηδενὶ τῷ Γ· τὸ γὰρ καθ' οὐ τὸ Β ἐνδέχεται τὸ Α μὴ ἐνδέχεσθαι τοῦτ' ἦν, τὸ μηδὲν
 6 ἀπολείπειν τῶν ὑπὸ τὸ Β ἐνδεχομένων.

Ὅταν δὲ τὸ Α παντὶ τῷ Β ἐνδέχεται τὸ δὲ Β ἐνδέχεται μηδενὶ τῷ Γ, διὰ μὲν τῶν εἰλημμένων προτάσεων οὐδεὶς γίγνεται συλλογισμὸς, ἀντιστραφεύσης δὲ τῆς ΒΓ κατὰ τὸ ἐνδέχεσθαι γίγνεται ὁ αὐτὸς ὅσπερ πρότερον. ἐπεὶ γὰρ ἐνδέχεται
 10 τὸ Β μηδενὶ τῷ Γ ὑπάρχειν, ἐνδέχεται καὶ παντὶ ὑπάρχειν (τοῦτο δ' εἴρηται πρότερον), ὥστ' εἰ τὸ μὲν Β παντὶ τῷ Γ τὸ δ' Α παντὶ τῷ Β, πάλιν ὁ αὐτὸς γίγνεται συλλογισμὸς. ὁμοίως δὲ καὶ εἰ πρὸς ἀμφοτέρας τὰς προτάσεις ἢ ἀπόφασιν τεθείη μετὰ τοῦ ἐνδέχεσθαι· λέγω δ' οἶον εἰ τὸ Α ἐνδέχεται
 15 μηδενὶ τῶν Β καὶ τὸ Β μηδενὶ τῶν Γ· διὰ μὲν γὰρ τῶν εἰλημμένων προτάσεων οὐδεὶς γίγνεται συλλογισμὸς, ἀντιστρεφομένων δὲ πάλιν ὁ αὐτὸς ἔσται ὡς καὶ πρότερον. φανερόν οὖν ὅτι τῆς ἀποφάσεως τιθεμένης πρὸς τὸ ἔλαττον ἄκρον ἢ πρὸς ἀμφοτέρας τὰς προτάσεις ἢ οὐ γίγνεται συλλογισμὸς ἢ γίγνεται
 20 μὲν ἄλλ' οὐ τέλειος· ἐκ γὰρ τῆς ἀντιστροφῆς γίγνεται τὸ ἀναγκαῖον.

¹ ὁμοιοσχήμων Α¹.

PRIOR ANALYTICS, I. XIII-XIV

predicated of the subject of which B is predicated, one premiss is problematic and the other assertoric. Let us, then, begin with the type whose premisses are similar in quality, as in the other examples.

XIV. When A may apply to all B, and B to all C, there will be a perfect syllogism to the effect that A may apply to all C. This is evident from the definition; for we said ^a that 'to be possible to apply to all' has this meaning. Similarly also if A may apply to no B, and B may apply to all C, there will be a syllogism to the effect that A may apply to no C; for we saw ^b that the proposition that A may not be predicated of the subject of which B may be predicated means that none of the possibilities which fall under the term B is wanting.

When, however, A may apply to all B and B may apply to no C, we get no syllogism by means of the premisses so taken; but when the premiss BC is converted in respect of possibility, we get the same syllogism as before.^c For since B may apply to no C, it may also apply to all C (this has been stated above); and so if B may apply to all C and A may apply to all B, we get the same syllogism again. Similarly also supposing the negative sense to refer to both premisses in conjunction with the sense of possibility. I mean, *e.g.*, if A may apply to no B, and B to no C; for we get no syllogism by means of the premisses so taken, but on their conversion we shall have once again the same syllogism as before. Thus it is evident that if the negative refers to the minor term or to both the premisses we either get no syllogism, or get a syllogism which is not perfect; for the necessary conclusion depends upon the conversion.

First figure.
(1) Both premisses problematic.
(a) Universal syllogisms.

^a 32 b 25 ff.

^b 32 b 38-40.

^c 32 a 29 ff.

83 a

- Ἐὰν δ' ἡ μὲν καθόλου τῶν προτάσεων ἡ δ' ἐν
μέρει ληφθῇ, πρὸς μὲν τὸ μείζον ἄκρον κειμένης
τῆς καθόλου συλλογισμὸς ἔσται τέλειος. εἰ γὰρ
τὸ Α παντὶ τῷ Β ἐνδέχεται τὸ δὲ Β τινὶ τῷ Γ, τὸ
Α τινὶ τῷ Γ ἐνδέχεται· τοῦτο δὲ φανερόν ἐκ τοῦ
25 ὀρισμοῦ τοῦ ἐνδέχεσθαι παντί.¹ πάλιν εἰ τὸ Α
ἐνδέχεται μηδενὶ τῷ Β τὸ δὲ Β τινὶ τῶν Γ ἐνδέχεται
ὑπάρχειν, ἀνάγκη τὸ Α ἐνδέχεσθαι τινὶ τῶν Γ μὴ
ὑπάρχειν· ἀποδείξεις δ' ἡ αὐτή. ἐὰν δὲ στερητική
ληφθῇ ἡ ἐν μέρει πρότασις ἡ δὲ καθόλου κατα-
φατική, τῇ δὲ θέσει ὁμοίως ἔχωσιν—οἷον τὸ μὲν
30 Α παντὶ τῷ Β ἐνδέχεται τὸ δὲ Β τινὶ τῷ Γ
ἐνδέχεται μὴ ὑπάρχειν—διὰ μὲν τῶν εἰλημμένων
προτάσεων οὐ γίνεται φανερός συλλογισμὸς, ἀντι-
στραφείσης δὲ τῆς ἐν μέρει καὶ τεθέντος τοῦ Β
τινὶ τῷ Γ ἐνδέχεσθαι ὑπάρχειν τὸ αὐτὸ ἔσται
συμπέρασμα ὃ καὶ πρότερον, καθάπερ ἐν τοῖς ἐξ
ἀρχῆς.
- 35 Ἐὰν δ' ἡ πρὸς τὸ μείζον ἄκρον ἐν μέρει ληφθῇ
ἡ δὲ πρὸς τὸ ἔλαττον καθόλου, ἐὰν τ' ἀμφότεραι
καταφατικαὶ τεθῶσιν ἐὰν τε στερητικαὶ ἐὰν τε
μὴ ὁμοιοσχήμονες ἐὰν τ' ἀμφότεραι ἀδιόριστοι ἢ
κατὰ μέρος, οὐδαμῶς ἔσται συλλογισμὸς· οὐδὲν γὰρ
κωλύει τὸ Β ὑπερτείνειν τοῦ Α καὶ μὴ κατηγορεῖ-
40 σθαι ἐπ' ἴσων· ὧ δ' ὑπερτείνει τὸ Β τοῦ Α, εἰλήφθω
33 b τὸ Γ· τούτῳ γὰρ οὔτε παντὶ οὔτε μηδενὶ οὔτε τινὶ
οὔτε μὴ τινὶ ἐνδέχεται τὸ Α ὑπάρχειν, εἴπερ ἀντι-
στρέφουσιν αἱ κατὰ τὸ ἐνδέχεσθαι προτάσεις καὶ
τὸ Β πλείουσιν ἐνδέχεται ἢ τὸ Α ὑπάρχειν. ἔτι δὲ
καὶ ἐκ τῶν ὄρων φανερόν· οὕτω γὰρ ἐχουσῶν

¹ παντί (deleto, quod cet. omnes fere habent codd., αβγ)
B: om. Bekker.

If one of the premisses is taken as universal and the other as particular, when the major premiss is universal there will be a perfect syllogism. For if A may apply to all B, and B to some C, A may apply to some C. This is evident from the definition of 'to be possible to apply to all.'^a Again, if A may apply to no B, and B may apply to some C, it necessarily follows that A may not apply to some C. The proof is the same as before. But if the particular premiss is negative and the universal affirmative, the premisses being in the same relation as before—*i.e.*, if A may apply to all B, and B may not apply to some C—, we get no obvious syllogism by means of the premisses so taken, but when the particular premiss is converted, *i.e.*, when B is taken as possibly applying to some C, we shall have the same conclusion as before,^b just as in the first examples.^c

If the major premiss is particular and the minor universal, whether they are both taken as affirmative, or both as negative, or as dissimilar in form; or if both are taken as indefinite or particular; in none of these cases will there be a syllogism. For there is nothing to prevent the term B from having a wider extension than the term A, and not being coterminous with it in predication. Let C represent the difference in extension between B and A. (Then there will be no syllogism,) for it is not possible that A should either apply to all or apply to none or apply to some or not apply to some of C; that is, if the problematic premisses are convertible and B may apply to more subjects than those to which A may apply. Further, this fact can be clearly shown by taking examples of terms; for the premisses are related in this way both

^a 32 b 25 ff.

^b l. 24.

^c 32 b 5-17.

δ τῶν προτάσεων τὸ πρῶτον τῷ ἐσχάτῳ καὶ οὐδενὶ ἐνδέχεται καὶ παντὶ ὑπάρχειν ἀναγκαῖον. ὅροι δὲ κοινοὶ πάντων τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης ζῶον—λευκόν—ἄνθρωπος, τοῦ δὲ μὴ ἐνδέχεσθαι ζῶον—λευκόν—ἱμάτιον.

Φανερόν οὖν τοῦτον τὸν τρόπον ἐχόντων τῶν ὅρων ὅτι οὐδεὶς γίγνεται συλλογισμός· ἡ γὰρ τοῦ
 10 ὑπάρχειν ἢ τοῦ ἐξ ἀνάγκης ἢ τοῦ ἐνδέχεσθαι πᾶς ἐστὶ συλλογισμός. τοῦ μὲν οὖν ὑπάρχειν καὶ τοῦ ἀναγκαῖον φανερόν ὅτι οὐκ ἔστιν, ὁ μὲν γὰρ καταφατικὸς ἀναιρεῖται τῷ στερητικῷ, ὁ δὲ στερητικὸς τῷ καταφατικῷ· λείπεται δὴ τοῦ ἐνδέχεσθαι εἶναι· τοῦτο δ' ἀδύνατον· δέδεικται γὰρ ὅτι οὕτως
 15 ἐχόντων τῶν ὅρων καὶ παντὶ τῷ ἐσχάτῳ τὸ πρῶτον ἀνάγκη καὶ οὐδενὶ ἐνδέχεται ὑπάρχειν· ὥστ' οὐκ ἂν εἴη τοῦ ἐνδέχεσθαι συλλογισμός· τὸ γὰρ ἀναγκαῖον οὐκ ἦν ἐνδεχόμενον.

Φανερόν δὲ ὅτι καθόλου τῶν ὅρων ὄντων ἐν ταῖς ἐνδεχομέναις προτάσεσιν αἰεὶ γίγνεται συλλογισμός
 20 ἐν τῷ πρώτῳ σχήματι, καὶ κατηγορικῶν καὶ στερητικῶν ὄντων, πλὴν κατηγορικῶν μὲν τέλειος, στερητικῶν δὲ ἀτελής.

Δεῖ δὲ τὸ ἐνδέχεσθαι λαμβάνειν μὴ ἐν τοῖς ἀναγκαίοις, ἀλλὰ κατὰ τὸν εἰρημένον διορισμόν· ἐνίστε δὲ λανθάνει τὸ τοιοῦτον.

25 XV. Ἐὰν δ' ἡ μὲν ὑπάρχειν ἢ δ' ἐνδέχεσθαι λαμβάνηται τῶν προτάσεων, ὅταν μὲν ἡ πρὸς τὸ μείζον ἄκρον ἐνδέχεσθαι σημαίνῃ, τέλειοί τ' ἔσονται πάντες οἱ συλλογισμοὶ καὶ τοῦ ἐνδέχεσθαι κατὰ τὸν εἰρημένον διορισμόν, ὅταν δ' ἡ πρὸς τὸ

^a Since the premisses give contradictory conclusions, no inference of fact or necessity can be drawn from them.

PRIOR ANALYTICS, I. XIV-XV

when the first term cannot apply to any and when it must apply to all of the last. Examples of terms common to all cases where the first term must apply to the last are animal—white—man ; where it cannot apply, animal—white—cloak.

Thus it is evident that when the terms are related in this way we get no syllogism ; for every syllogism is either assertoric or apodeictic or problematic. Now evidently there is no assertoric or apodeictic syllogism in this case ; for the affirmative is invalidated by the negative conclusion, and the negative by the affirmative.^a The remaining alternative, then, is that the syllogism should be problematic. But this is impossible ; for it has been shown that the terms are related in this way both when the first must apply to all, and when it can apply to none, of the last. Thus there cannot be a problematic syllogism ; for we have seen ^b that that which is necessary is not possible.

It is also evident that when the terms in problematic premisses are universal, we always get a syllogism in the first figure, whether the terms are both positive or both negative ; with the difference, however, that when they are positive the syllogism is perfect, and when they are negative it is imperfect.

The term ' possible ' must be understood, not with reference to that which is necessary, but in accordance with the definition already given.^c Points of this kind are sometimes overlooked.

XV. If one of the premisses is assertoric and the other problematic, when it is the major premiss that expresses possibility, all the syllogisms will be perfect and will be of the ' possible ' type in accordance with the definition of possibility given above ^d ; but

B. One assertoric and one problematic premiss.
(1) Both premisses universal.

^b 32 a 28.

^c 32 a 18.

^d 32 a 18.

33 b

ἐλαττον, ἀτελεῖς τε πάντες, καὶ οἱ στερητικοὶ τῶν
 30 συλλογισμῶν οὐ τοῦ κατὰ τὸν διορισμὸν ἐνδεχο-
 μένου, ἀλλὰ τοῦ μηδενὶ ἢ μὴ παντὶ ἐξ ἀνάγκης
 ὑπάρχειν· εἰ γὰρ μηδενὶ ἢ μὴ παντὶ ἐξ ἀνάγκης,
 ἐνδέχεσθαι φαμεν καὶ μηδενὶ καὶ μὴ παντὶ ὑπάρχειν.

Ἐνδεχέσθω γὰρ τὸ Α παντὶ τῷ Β, τὸ δὲ Β
 παντὶ τῷ Γ κείσθω ὑπάρχειν· ἐπεὶ οὖν ὑπὸ τὸ Β
 35 ἐστὶ τὸ Γ τῷ δὲ Β παντὶ ἐνδέχεται τὸ Α, φανερόν
 ὅτι καὶ τῷ Γ παντὶ ἐνδέχεται. γίνεταί δὴ τέλειος
 συλλογισμός. ὁμοίως δὲ καὶ στερητικῆς οὔσης
 τῆς ΑΒ προτάσεως τῆς δὲ ΒΓ καταφατικῆς,
 καὶ τῆς μὲν ἐνδέχεσθαι τῆς δὲ ὑπάρχειν λαμ-
 βανούσης, τέλειος συλλογισμός ὅτι τὸ Α ἐνδέχεται
 40 μηδενὶ τῷ Γ ὑπάρχειν.

34 a Ὅτι μὲν οὖν τοῦ ὑπάρχειν τιθεμένου πρὸς τὸ
 ἐλαττον ἄκρον τέλειοι γίνονται συλλογισμοί,
 φανερόν· ὅτι δ' ἐναντίως ἔχοντος ἔσονται συλ-
 λογισμοὶ διὰ τοῦ ἀδυνάτου δεικτέον· ἅμα δ' ἔσται
 δῆλον καὶ ὅτι ἀτελεῖς· ἡ γὰρ δεῖξις οὐκ ἐκ τῶν
 5 εἰλημμένων προτάσεων.

Πρῶτον δὲ λεκτέον ὅτι εἰ τοῦ Α ὄντος ἀνάγκη
 τὸ Β εἶναι, καὶ δυνατοῦ ὄντος τοῦ Α δυνατόν ἔσται
 τὸ Β ἐξ ἀνάγκης. ἔστω γὰρ οὕτως ἐχόντων τὸ
 μὲν ἐφ' ᾧ τὸ Α δυνατόν, τὸ δ' ἐφ' ᾧ τὸ Β ἀδύ-
 νατον. εἰ οὖν τὸ μὲν δυνατόν, ὅτε δυνατόν εἶναι,
 10 γένοιτ' ἂν, τὸ δ' ἀδύνατον, ὅτ' ἀδύνατον, οὐκ
 ἂν γένοιτο, ἅμα δ' εἰ τὸ Α δυνατόν καὶ τὸ Β ἀδύνατον,
 ἐνδέχοιτ' ἂν τὸ Α γενέσθαι ἄνευ τοῦ Β, εἰ δὲ

* This is a mistake on Aristotle's part; the qualification applies equally to the affirmative syllogisms. It is due to the fact that proof *per impossibile* cannot establish both values of a problematic premiss. See note on 34 b 6.

^b Cf. 25 a 37, 32 a 20.

when it is the minor premiss, they will all be imperfect, and such as are negative ^a will not be 'possible' in accordance with the definition, but will be to the effect that the predicate does not necessarily apply to any, or to all, of the subject; for if it does not necessarily apply to any or to all, we say that it may apply to none or may not apply to all.^b

For example, let A possibly apply to all B, and let it be assumed that B applies to all C. Then since C falls under B, and A may apply to all B, evidently A may apply to all C. Thus we get a perfect syllogism. Similarly too if the premiss AB is negative and BC affirmative, the former being problematic and the latter assertoric, there is a perfect syllogism to the effect that A may apply to no C.

(a) Major problematic, minor assertoric.

Thus it is evident that when the assertoric sense refers to the minor extreme we get perfect syllogisms; but to prove that syllogisms will result when it is in the opposite relation we must employ reduction *ad impossibile*. At the same time it will also become apparent that these syllogisms will be imperfect; for the proof will not be drawn from the premisses originally assumed.

We must first observe that if when A is, B must be, then if A is possible, B must necessarily be possible.^c For assuming this relation ^d between A and B, let us suppose A to be possible and B impossible. Then (1) if the possible, when it is possible for it to be, may come to be, but the impossible, when it is impossible, cannot come to be; and also (2) if A is possible and B impossible, then it may be possible for A to come to be apart from B; and if

Proof that if A implies B, and A is possible, B must also be possible.

^c Cf. *Metaphysics*, IX. (Θ) 1047 b 14-30.

^d i.e. that A implies B.

84 a

γενέσθαι, καὶ εἶναι· τὸ γὰρ γεγονός, ὅτε γέγονεν, ἔστιν. δεῖ δὲ λαμβάνειν μὴ μόνον ἐν τῇ γενέσει τὸ ἀδύνατον καὶ δυνατόν, ἀλλὰ καὶ ἐν τῷ ἀλη-
 15 θεύεσθαι καὶ ἐν τῷ ὑπάρχειν, καὶ ὁσαυχῶς ἄλλως λέγεται τὸ δυνατόν· ἐν ἅπασιν γὰρ ὁμοίως ἔξει. ἔτι τὸ ὄντος τοῦ Α τὸ Β εἶναι οὐχ ὡς ἐνός τινος ὄντος τοῦ Α τὸ Β ἔσται δεῖ ὑπολαβεῖν· οὐ γάρ ἔστιν οὐδὲν ἐξ ἀνάγκης ἐνός τινος ὄντος, ἀλλὰ δυοῖν ἐλαχίστοις, οἷον ὅταν αἱ προτάσεις οὕτως ἔχωσιν ὡς ἐλέχθη κατὰ τὸν συλλογισμόν· εἰ γὰρ
 20 τὸ Γ κατὰ τοῦ Δ τὸ δὲ Δ κατὰ τοῦ Ζ, καὶ τὸ Γ κατὰ τοῦ Ζ ἐξ ἀνάγκης· καὶ εἰ δυνατόν δ' ἐκάτερον, καὶ τὸ συμπέρασμα δυνατόν. ὥσπερ οὖν εἰ τις θείῃ τὸ μὲν Α τὰς προτάσεις τὸ δὲ Β τὸ συμπέρασμα, συμβαίνοι ἂν οὐ μόνον ἀναγκαίου τοῦ Α ὄντος καὶ τὸ Β εἶναι ἀναγκαῖον, ἀλλὰ καὶ δυνατοῦ δυνατόν.

25 Τούτου δὲ δειχθείτος φανερόν ὅτι ψεύδους ὑπο-
 τεθείτος καὶ μὴ ἀδυνάτου καὶ τὸ συμβαῖνον διὰ τὴν ὑπόθεσιν ψεῦδος ἔσται καὶ οὐκ ἀδύνατον. οἷον εἰ τὸ Α ψεῦδος μὲν ἔστι μὴ μέντοι ἀδύνατον, ὄντος δὲ τοῦ Α τὸ Β ἔστι, καὶ τὸ Β ἔσται ψεῦδος μὲν οὐ μέντοι ἀδύνατον· ἔπει γὰρ δέδεικται ὅτι
 30 εἰ τοῦ Α ὅτις τὸ Β ἔστι, καὶ δυνατοῦ ὄντος τοῦ Α ἔσται τὸ Β δυνατόν, ὑπόκειται δὲ τὸ Α δυνατόν εἶναι, καὶ τὸ Β ἔσται δυνατόν· εἰ γὰρ ἀδύνατον, ἅμα δυνατόν ἔσται τὸ αὐτὸ καὶ ἀδύνατον.

Διωρισμένων δὴ τούτων ὑπαρχέτω τὸ Α παντὶ
 35 τῷ Β, τὸ δὲ Β παντὶ τῷ Γ ἐνδεχέσθω· ἀνάγκη

* The reference seems to be to 24 b 18, but the point is never proved ; cf. 40 b 35, *An. Post.* 73 a 8, 94 a 24.

to come to be, then to be ; for that which has come to be, when it has come to be, is. We must understand the terms 'possible' and 'impossible' with respect not only to generation but also to true statement and to attribution, and in all the other senses in which the term 'possible' is used ; for the same principle will obtain in all of them. Further, we must not suppose that the proposition 'if A is, B is' means that B will be if some *one* assumption A is granted ; for nothing necessarily follows from the granting of one assumption : two at least are required, as, *e.g.*, when the premisses are related as we said ^a with respect to the syllogism. For if C is predicated of D, and D of E, C must also be predicated of E. Moreover, if each of the premisses is possible, the conclusion is also possible. Thus supposing that A represents the premisses and B the conclusion, it will follow, not only that when A is necessary B is necessary too, but also that when A is possible B is possible.

As the result of this proof it is evident that if a hypothesis is false ^b but not impossible, the result which is reached by means of the hypothesis will be false but not impossible. For example, if A is false but not impossible, and if when A is, B is, then B will be false but not impossible. For since it has been proved that if when A is, B is, when A is possible, B will also be possible ; and since it is assumed that A is possible, then B will also be possible ; for if it is impossible, the same thing will be at once possible and impossible.

Now that we have made these points clear, let us assume that A applies to all B, and that B may

Hence if a premiss is possible, its falsity does not invalidate the conclusion.

(b) Major assertoric minor

^b For the sense of 'false' here see 34 a 37.

84 a

οὖν τὸ Α παντὶ τῷ Γ ἐνδέχασθαι ὑπάρχειν. μὴ γὰρ ἐνδεχέσθω, τὸ δὲ Β παντὶ τῷ Γ κείσθω ὡς ὑπάρχον· τοῦτο δὲ ψεῦδος μὲν οὐ μέντοι ἀδύνατον. εἰ οὖν τὸ μὲν Α μὴ ἐνδέχεται τῷ Γ τὸ δὲ Β παντὶ ὑπάρχει τῷ Γ, τὸ Α οὐ παντὶ τῷ Β ἐνδέχεται.

40 γίγνεται γὰρ συλλογισμὸς διὰ τοῦ τρίτου σχήματος. ἀλλ' ὑπέκειτο παντὶ ἐνδέχασθαι ὑπάρχειν· ἀνάγκη

84 b ἄρα τὸ Α παντὶ τῷ Γ ἐνδέχασθαι· ψεῦδους γὰρ τεθέντος καὶ οὐκ ἀδυνάτου τὸ συμβαῖνόν ἐστιν ἀδύνατον.

* i.e. it is not implied by the original premiss. Cf. Alexander 185. 16-20; Becker, *A.T.M.* 53 f.

^b If Aristotle means this conclusion to be apodeictic he is inconsistent; cf. 31 b 37 ff. Becker suggests that since ἀνάγκη is often used merely to indicate the necessary relation of conclusion to premisses, οὐκ ἐνδέχεται may be used here in the same sense. At best the ambiguity is unhappy. It seems more likely that Aristotle was deceived by his own formula. See next note.

^c Actually the assumption was that A applies to all B. Probably Aristotle employs the weaker form as being the normal contradictory of 'A cannot apply to all B' (see previous note). The substitution does not affect the validity of the argument.

^d The form of the argument (and its fallacy) can be clearly seen in the following example, for which I am indebted to Professor T. M. Knox:

If (a) All Fellows are wise
and (b) All graduates may be Fellows
to prove that (c) All graduates may be wise.

Assume the contradictory of (c), viz.,

(d) Some graduates cannot be wise.

For (b) substitute the false but not impossible premiss

(e) All graduates are Fellows.

∴ (f) Some Fellows [cannot be] are not wise.

apply to all C. Then it necessarily follows that A may apply to all C. For let us assume that it cannot possibly apply, and let B be taken as applying to all C (this is false,^a but not impossible). If then A cannot apply to $\langle$ all $\rangle$ C, but B applies to all C, A cannot^b apply to all B; for we get a syllogism by means of the third figure. But *ex hypothesi* A may^c apply to all B. Hence it necessarily follows that A may apply to all C; for by making a false though not impossible assumption we get an impossible result.^d

problem-
atic. Proof
per impos-
sibile.
(i.) Both
premisses
affirmative.

But this is incompatible with

(a) All Fellows [may be] are wise

[$\therefore$ since (c) is not incompatible with (a)

(d) must be incompatible with (a)].

$\therefore$ (c), the contrary of (d), must be true.

First it should be noted that the proof excludes the negative values of (b). It could only establish that no graduates are necessarily not wise (*cf.* 33 b 29). But it fails even to do this. The flaws in the argument are indicated by square brackets. The first two have been noted above, and are relatively unimportant. In the third case the argument clearly depends upon some tacit assumption, which Becker (*A.T.M.* 53) formulates thus:

Wenn $G_1\xi$ & $G_2\xi$ unmöglich ist in bezug auf $F\xi$,

$G_2\xi$ dagegen möglich ist

dann ist G_1 unmöglich

„ „
„ „

In my opinion his formula is too general and his examples unsuitable for the case in hand. The assumption is rather: If the conjunction of two premisses (d) and (e) gives a conclusion (f) which is incompatible with a given hypothesis (a), whereas one of these premisses (e) is compatible with the said hypothesis, then the other premiss (f) must be incompatible with the said hypothesis.

It will be seen that in our example neither (d) nor (e) is in itself incompatible with (a). The incompatibility only becomes apparent when each premiss is examined in the light of the other; *i.e.*, it is the result of their conjunction. Thus Aristotle's assumption is unsound and the proof fails.

34 b

Ἐγχωρεῖ δὲ καὶ διὰ τοῦ πρώτου σχήματος ποιῆσαι τὸ ἀδύνατον θέντας τῷ Γ τὸ Β ὑπάρχειν· εἰ γὰρ τὸ Β παντὶ τῷ Γ ὑπάρχει τὸ δὲ Α παντὶ τῷ Β ἐνδέχεται, κἂν τῷ Γ παντὶ ἐνδέχοιτο τὸ Α· ἀλλ' ὑπέκειτο μὴ παντὶ ἐγχωρεῖν.

Δεῖ δὲ λαμβάνειν τὸ παντὶ ὑπάρχειν μὴ κατὰ χρόνον ὀρίσαντας, ὅσον νῦν ἢ ἐν τῷδε τῷ χρόνῳ, ἀλλ' ἀπλῶς· διὰ τοιούτων γὰρ προτάσεων καὶ τοὺς συλλογισμοὺς ποιούμεν, ἐπεὶ κατὰ γε τὸ νῦν λαμβανομένης τῆς προτάσεως οὐκ ἔσται συλλογισμός· οὐδὲν γὰρ ἴσως κωλύει ποτὲ καὶ παντὶ κινουμένῳ ἄνθρωπον ὑπάρχειν, ὅσον εἰ μηδὲν ἄλλο κινοῖτο· τὸ δὲ κινούμενον ἐνδέχεται παντὶ ἵππῳ· ἀλλ' ἄνθρωπον οὐδενὶ ἵππῳ ἐνδέχεται. ἔτι ἔστω τὸ μὲν πρῶτον ζῶον, τὸ δὲ μέσον κινούμενον, τὸ δ' ἔσχατον ἄνθρωπος· αἱ μὲν οὖν προτάσεις ὁμοίως ἔξουσιν, τὸ δὲ συμπέρασμα ἀναγκαῖον, οὐκ ἐνδεχό-

* I follow the traditional view that this paragraph is intended to offer an alternative *per impossibile* proof of the syllogism in 34 a 34-36. If we keep the same example as before, the argument appears to be:

The premisses (g) All Fellows may be wise
and (e) All graduates are Fellows

which are compatible with the original premisses (a) and (b), give the conclusion (c) All graduates may be wise, which is therefore compatible with (a) and (b). Hence (d), the contradictory of (c), is incompatible with (a) and (b), and therefore false. Therefore (c) is true.

The argument only establishes the conclusion as a possibility, not as a necessary inference. Hence Becker (*A.T.M.* 57) offers a different explanation; ingenious but hardly convincing

^b This warning against temporal qualifications was no doubt designed to defend the foregoing syllogism against objections in the form of the examples which follow in the

We can also exhibit an impossibility through the first figure, by assuming that B applies to C. For if B applies to all C, and A may apply to all B, A may also apply to all C. But it was assumed that it cannot apply to all.^a

We must understand the expression 'applying to all,' not as qualified in respect of time,^b e.g., 'now' or 'at such-and-such a time,' but in an absolute sense; for it is by means of premisses taken in this latter way that we effect our syllogisms. If the premiss is taken as relating to the present moment, there will be no syllogism. For presumably there is no reason why at some time 'man' should not apply to everything that is in motion: i.e., if nothing else were then in motion; but the term 'in motion' may apply to all horses, and 'man' cannot apply to any horse. Again, let us take the first term as 'animal,' the middle as 'in motion,' and the last as 'man.' Then the premisses will be related in the same way as before, but the conclusion is apodeictic

Universal premisses must have no temporal qualification.

text. The whole paragraph, however, is ill thought out. We have already seen that the major premiss above is treated now as assertoric, now as problematic. Presumably we are here to regard it as assertoric; although the formula *οὐδὲν κωλύει*, etc., points more naturally to a problematic sense. If assertoric, the judgement 'everything in motion is a man' is certainly not universal but collective or enumerative. But the fallacy of the syllogism in which it appears as major premiss is due rather to the incompatibility of the two premisses; the conditions which validate the major exclude the minor.

In the second example the conclusion 'all men may be animals' is the only legitimate inference from the premisses, which are perfectly compatible. Aristotle apparently rejects it because he expects a valid conclusion to state the full and permanent logical relation between the terms which it contains. Cf. *Introd.* p. 188.

34 b

μενον· ἐξ ἀνάγκης γὰρ ὁ ἄνθρωπος ζῶον. φανερόν
οὖν ὅτι τὸ καθόλου ληπτέον ἀπλῶς, καὶ οὐ χρόνῳ
διορίζοντας.

Πάλιν ἔστω στερητικὴ πρότασις καθόλου ἢ AB,
20 καὶ εἰλήφθω τὸ μὲν A μηδενὶ τῷ B ὑπάρχειν, τὸ
δὲ B παντὶ ἐνδεχέσθω ὑπάρχειν τῷ Γ. τούτων
οὖν τεθέντων ἀνάγκη τὸ A ἐνδέχεσθαι μηδενὶ τῷ
Γ ὑπάρχειν. μὴ γὰρ ἐνδεχέσθω, τὸ δὲ B τῷ
Γ κείσθω ὑπάρχον, καθάπερ πρότερον· ἀνάγκη δὴ
τὸ A τινὶ τῷ B ὑπάρχειν· γίνεται γὰρ συλ-
25 λογισμὸς διὰ τοῦ τρίτου σχήματος. τοῦτο δὲ
ἀδύνατον· ὥστ' ἐνδέχοιτ' ἂν τὸ A μηδενὶ τῷ Γ·
ψεύδους γὰρ τεθέντος ἀδύνατον τὸ συμβαῖνον.
οὗτος οὖν ὁ συλλογισμὸς οὐκ ἔστι τοῦ κατὰ τὸν
διορισμὸν ἐνδεχομένου, ἀλλὰ τοῦ μηδενὶ ἐξ ἀνάγκης·
αὕτη γάρ ἐστιν ἡ ἀντίφασις τῆς γενομένης ὑπο-
30 θέσεως, ἐτέθη γὰρ ἐξ ἀνάγκης τὸ A τινὶ τῷ Γ
ὑπάρχειν, ὁ δὲ διὰ τοῦ ἀδυνάτου συλλογισμὸς τῆς
ἀντικειμένης ἐστὶν ἀντιφάσεως.

Ἔτι δὲ καὶ ἐκ τῶν ὁρῶν φανερόν ὅτι οὐκ ἔσται
τὸ συμπέρασμα ἐνδεχόμενον. ἔστω γὰρ τὸ μὲν
A κόραξ, τὸ δ' ἐφ' ᾧ B διανοούμενον, ἐφ' ᾧ δὲ Γ
ἄνθρωπος· οὐδενὶ δὴ τῷ B τὸ A ὑπάρχει, οὐδέν
85 γὰρ διανοούμενον κόραξ· τὸ δὲ B παντὶ ἐνδέχεται
τῷ Γ, παντὶ γὰρ ἀνθρώπῳ τὸ διανοεῖσθαι· ἀλλὰ
τὸ A ἐξ ἀνάγκης οὐδενὶ τῷ Γ· οὐκ ἄρα τὸ συμ-
πέρασμα ἐνδεχόμενον. ἀλλ' οὐδ' ἀναγκαῖον αἰεί.

* i.e. that A must apply to some C.

† 34 a 36.

‡ 31 b 20 ff. The conclusion is only assertoric.

§ Cf. 34 b 1. In the present passage there is clearly an ellipse of καὶ οὐκ ἀδύνατον, which Jenkinson overlooks.

and not problematic; for man is necessarily an animal. Thus it is evident that the universal premiss must be taken absolutely, and not as qualified in respect of time.

Again, let AB be a negative universal premiss, and let it be assumed that A applies to no B, and that B may apply to all C. Then it must follow from these assumptions that A may apply to no C. For let us assume that it cannot apply <to no C>,^a and let B be taken as applying to all C, as before.^b Then it must follow that A applies to some B; for we get a syllogism by means of the third figure.^c But this is impossible. Therefore it will be possible for A to apply to no C; for by making a false <but not impossible> assumption we get an impossible result.^d Thus this syllogism does not give a conclusion which is 'possible' in the sense defined,^e but proves that the predicate does not necessarily apply to any of the subject; for this is the contradictory of the assumption which we made, since it was assumed that A necessarily applies to some C, and the syllogism *per impossibile* proves the contradictory opposed to the <impossible> assumption.

(ii.) Major
negative,
minor
affirmative.

Again, it is evident from considering examples of terms that the conclusion will not be problematic. Let A stand for 'crow,' B for 'intelligent,' and C for 'man.' Then A applies to no B; for nothing intelligent is a crow. But B may apply to all C; for intelligence may apply to every man. But A necessarily applies to no C.^f Hence the conclusion is not problematic. Nor, however, is it always

^a 32 a 18.

^f This excludes the possibility that A may apply to all C, which would be implicit in a truly problematic conclusion.

34 b

ἔστω γὰρ τὸ μὲν Α κινούμενον, τὸ δὲ Β ἐπιστήμη,
 τὸ δ' ἐφ' ᾧ Γ ἄνθρωπος. τὸ μὲν οὖν Α οὐδενὶ τῷ
 40 Β ὑπάρξει, τὸ δὲ Β παντὶ τῷ Γ ἐνδέχεται, καὶ
 οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον· οὐ γὰρ
 25 ἀνάγκη μηδένα κινεῖσθαι ἄνθρωπον, ἀλλ' οὐκ
 ἀνάγκη τινά. δῆλον οὖν ὅτι τὸ συμπέρασμά ἐστι
 τοῦ μηδενὶ ἐξ ἀνάγκης ὑπάρχειν. ληπτέον δὲ
 βέλτιον τοὺς ὅρους.

Ἐὰν δὲ τὸ στερητικὸν τεθῇ πρὸς τὸ ἔλαττον
 ἄκρον ἐνδέχεσθαι σημαῖνον, ἐξ αὐτῶν μὲν τῶν
 6 εἰλημμένων προτάσεων οὐδεὶς ἔσται συλλογισμός,
 ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προ-
 τάσεως ἔσται, καθάπερ ἐν τοῖς πρότερον. ὑπ-
 αρχέτω γὰρ τὸ Α παντὶ τῷ Β, τὸ δὲ Β ἐνδεχέσθω
 μηδενὶ τῷ Γ. οὕτω μὲν οὖν ἐχούτων τῶν ὄρων
 οὐδὲν ἔσται ἀναγκαῖον· ἐὰν δ' ἀντιστραφῇ τὸ ΒΓ
 10 καὶ ληφθῇ τὸ Β παντὶ τῷ Γ ἐνδέχεσθαι, γίνεται
 συλλογισμὸς ὥσπερ πρότερον· ὁμοίως γὰρ ἔχουσιν
 οἱ ὅροι τῇ θέσει. τὸν αὐτὸν δὲ τρόπον καὶ στερη-
 τικῶν ὄντων ἀμφοτέρων τῶν διαστημάτων, ἐὰν τὸ
 μὲν ΑΒ μὴ ὑπάρχη, τὸ δὲ ΒΓ μηδενὶ ἐνδέχεσθαι
 σημαίη· δι' αὐτῶν μὲν γὰρ τῶν εἰλημμένων
 15 οὐδαμῶς γίνεται τὸ ἀναγκαῖον, ἀντιστραφείσης
 δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως ἔσται
 συλλογισμὸς. εἰλήφθω γὰρ τὸ μὲν Α μηδενὶ τῷ
 Β ὑπάρχον,¹ τὸ δὲ Β ἐνδέχεσθαι μηδενὶ τῷ Γ· διὰ
 μὲν οὖν τούτων οὐδὲν ἀναγκαῖον, ἐὰν δὲ ληθῇ τὸ
 Β παντὶ τῷ Γ ἐνδέχεσθαι, ὅπερ ἐστὶν ἀληθές, ἢ
 20 δὲ ΑΒ πρότασις ὁμοίως ἔχη, πάλιν ὁ αὐτὸς ἔσται

¹ ὑπάρχειν n.

apodeictic ; for let A stand for ' in motion ' and B for ' knowledge ' and C for ' man.' Then A will apply to no B, but B may apply to all C,^a and the conclusion will not be apodeictic. For it is not necessary that no man should be in motion ; rather it is not necessary that any man should be. Thus it is clear that the conclusion proves that the predicate does not necessarily apply to any of the subject. But the terms must be better chosen.

If, however, the negative premiss refers to the minor extreme and has the problematic signification, there will be no syllogism from the actual premisses assumed, but when the problematic premiss is converted there will be a syllogism, as in the previous examples.^b Let A apply to all B, and let B possibly apply to no C. Then with the terms in this relation there will be no necessary inference ; but if the premiss BC is converted and B is taken as possibly applying to all C, we get a syllogism as before ^c ; for the terms are similarly disposed. The same is true when both the propositions are negative, if AB is assertoric and negative, and BC has the sense of possibly applying to none. For by means of the assumptions as they stand we reach no necessary inference at all ; but when the problematic premiss is converted there will be a syllogism. For let it be assumed that A applies to no B, and that B may apply to no C. Then from these assumptions there is no necessary inference ; but if it is assumed that B may apply to all C, which is true, while the premiss AB remains the same, we shall get the same syllo-

(iii.) Major affirmative, minor negative.

(iv.) Both premisses negative.

^a This is false. Knowledge cannot ' apply ' to man in the sense that man is knowledge. Aristotle confuses *ἐπιστήμη* with *ἐπίσθημον* (*cf.* ch. xxxiv.). The confession in 35 a 2 is significant.

^b 33 a 7, 16.

^c 34 a 34.

35 a

συλλογισμός. εἰ μὴ ὑπάρχειν τεθῇ τὸ Β παντὶ τῷ Γ καὶ μὴ ἐνδέχασθαι μὴ ὑπάρχειν, οὐκ ἔσται συλλογισμός οὐδαμῶς, οὔτε στερητικῆς οὔσης οὔτε καταφατικῆς τῆς ΑΒ προτάσεως. ὅροι δὲ κοινοὶ τοῦ μὲν ἐξ ἀνάγκης ὑπάρχειν λευκόν—ζῶον—χιών, τοῦ δὲ μὴ ἐνδέχασθαι λευκόν—ζῶον—πίττα.

- 25 Φανερόν οὖν ὅτι καθόλου τῶν ὁρων ὄντων καὶ τῆς μὲν ὑπάρχειν τῆς δ' ἐνδέχασθαι λαμβανομένης τῶν προτάσεων, ὅταν ἢ πρὸς τὸ ἔλαττον ἄκρον ἐνδέχασθαι λαμβάνηται πρότασις, αἰεὶ γίγνεται συλλογισμός, πλην ὅτε μὲν ἐξ αὐτῶν ὅτε δ' ἀντιστραφείσης τῆς προτάσεως· πότε δὲ τούτων
30 ἐκάτερος καὶ διὰ τίν' αἰτίαν, εἰρήκαμεν.

Ἐὰν δὲ τὸ μὲν καθόλου τὸ δ' ἐν μέρει ληφθῇ τῶν διαστημάτων, ὅταν μὲν τὸ πρὸς τὸ μείζον ἄκρον καθόλου τεθῇ καὶ ἐνδεχόμενον, εἴτε ἀποφατικὸν εἴτε καταφατικόν, τὸ δ' ἐν μέρει καταφατικὸν καὶ ὑπάρχον, ἔσται συλλογισμός τέλειος,
35 καθάπερ καὶ καθόλου τῶν ὁρων ὄντων. ἀπόδειξις δ' ἢ αὐτὴ ἢ καὶ πρότερον. ὅταν δὲ καθόλου μὲν ἢ τὸ πρὸς τὸ μείζον ἄκρον, ὑπάρχον δὲ καὶ μὴ ἐνδεχόμενον, θάτερον δ' ἐν μέρει καὶ ἐνδεχόμενον, εἴαν τ' ἀποφατικαὶ εἴαν τε καταφατικαὶ τεθῶσιν ἀμφότεραι εἴαν τε ἢ μὲν ἀποφατικὴ ἢ δὲ κατα-
40 φατικὴ, πάντως ἔσται συλλογισμός ἀτελής· πλην
35 b οἱ μὲν διὰ τοῦ ἀδυνάτου δειχθήσονται οἱ δὲ διὰ τῆς ἀντιστροφῆς τῆς τοῦ ἐνδέχασθαι, καθάπερ ἐν τοῖς πρότερον.

Ἔσται δὲ συλλογισμός διὰ τῆς ἀντιστροφῆς καὶ ὅταν ἢ μὲν καθόλου πρὸς τὸ μείζον ἄκρον τεθείσα

gism once more.^a But if it is assumed, not that B may apply to no C, but that B does not apply to any C, there will be no syllogism in any case, whether the premiss AB is negative or affirmative. Terms common to both cases and showing a positive apodeictic relation of predicate to subject are white—animal—snow ; showing a negative apodeictic relation, white—animal—pitch.

Thus it is evident that if the terms are universal and one premiss is assertoric and the other problematic, when the minor premiss is problematic, a syllogism always results—sometimes from the original assumptions and sometimes after the conversion of the said premiss. We have explained under what conditions each of these two cases obtains, and for what reason.

If, however, one of the propositions is universal and the other particular, when the major premiss is universal and problematic (whether negative or affirmative) and the particular premiss is affirmative and assertoric, there will be a perfect syllogism, just as when the terms were universal. The proof is the same as before.^b But when the major premiss is universal, but assertoric and not problematic, and the other is particular and problematic, if both premisses are negative, or both affirmative, or one negative and the other affirmative, in every case there will be an imperfect syllogism ; but some will be proved *per impossibile* and others by the conversion of the problematic premiss, as in the previous examples.

We shall also have a syllogism by means of conversion when the universal major premiss has an

^a Cf. 34 b 19.

^b 33 b 33 ff.

85 b

- σημαίνει τὸ ὑπάρχειν ἢ μὴ ὑπάρχειν, ἢ δ' ἐν μέρει
 6 στερητική οὐσα τὸ ἐνδέχασθαι λαμβάνη, ὅσον εἰ
 τὸ μὲν Α παντὶ τῷ Β ὑπάρχει ἢ μὴ ὑπάρχει, τὸ
 δὲ Β τινὶ τῷ Γ ἐνδέχεται μὴ ὑπάρχειν· ἀντιστρα-
 φέντος γὰρ τοῦ ΒΓ κατὰ τὸ ἐνδέχασθαι γίγνεται
 συλλογισμός. ὅταν δὲ τὸ μὴ ὑπάρχειν λαμβάνη
 ἢ κατὰ μέρος τεθεῖσα, οὐκ ἔσται συλλογισμός.
 10 ὅροι τοῦ μὲν ὑπάρχειν λευκόν—ζῶον—χιών, τοῦ
 δὲ μὴ ὑπάρχειν λευκόν—ζῶον—πίττα· διὰ γὰρ τοῦ
 ἀδιόριστου ληπτέον τὴν ἀπόδειξιν.

- Ἐὰν δὲ τὸ καθόλου τεθῇ πρὸς τὸ ἔλαττον ἄκρον
 τὸ δ' ἐν μέρει πρὸς τὸ μείζον, εἴαν τε στερητικὸν
 εἴαν τε καταφατικόν εἴαν τ' ἐνδεχόμενον εἴαν θ'
 ὑπάρχον ὅποτερονοῦν, οὐδαμῶς ἔσται συλλογισμός.
 15 οὐδ' ὅταν ἐν μέρει ἢ ἀδιόριστοι τεθῶσιν αἱ προ-
 τάσεις, εἴτ' ἐνδέχασθαι λαμβάνουσιν εἴθ' ὑπάρχειν
 εἴτ' ἐναλλάξ, οὐδ' οὕτως ἔσται συλλογισμός· ἀπό-
 δειξεις δ' ἢ αὐτὴ ἢ καπὶ τῶν πρότερον. ὅροι δὲ
 κοινοὶ τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης ζῶον—λευκόν
 —ἄνθρωπος, τοῦ δὲ μὴ ἐνδέχασθαι ζῶον—λευκόν
 —ἱμάτιον.

- 20 Φανερόν οὖν ὅτι τοῦ μὲν πρὸς τὸ μείζον ἄκρον
 καθόλου τεθέντος αἰεὶ γίγνεται συλλογισμός, τοῦ
 δὲ πρὸς τὸ ἔλαττον οὐδέποτε οὐδαμῶς.

- XVI. Ὅταν δ' ἢ μὲν ἐξ ἀνάγκης ὑπάρχειν ἢ δ'
 ἐνδέχασθαι σημαίνει τῶν προτάσεων, ὁ μὲν συλ-
 25 λογισμός ἔσται τὸν αὐτὸν τρόπον ἐχόντων τῶν
 ὁρῶν, καὶ τέλειος ὅταν πρὸς τῷ ἐλάττονι ἄκρῳ
 τεθῇ τὸ ἀναγκαῖον· τὸ δὲ συμπέρασμα κατηγορικῶν

• Cf. 26 b 14, 27 b 20.

affirmative or negative assertoric sense, and the particular premiss is negative and has a problematic sense : *e.g.*, if A applies or does not apply to all B, and B may not apply to some C ; for when BC is converted we get a problematic syllogism. But when the particular premiss is assertoric and negative, there will be no syllogism. Examples of terms where the predicate applies to the subject are white—animal—snow ; where it does not apply, white—animal—pitch. The proof must be drawn from the indefinite nature of the particular premiss.^a

But if the universal premiss refers to the minor extreme, and the particular to the major, whether either premiss is negative or affirmative, problematic or assertoric, there will in no case be a syllogism. Also when the premisses are particular or indefinite, whether both entail a problematic or both an assertoric relation, or one the former and the other the latter ; under these conditions too there will be no syllogism. The proof is the same as in the previous examples.^b Terms common to all cases where the predicate necessarily applies to the subject are animal—white—man ; where it cannot possibly apply, animal—white—coat.

Thus it is evident that when the major premiss is universal, a syllogism always results ; but when the minor is universal there is never any syllogism of any kind.

XVI. When one of the premisses has an apodeictic and the other a problematic sense, there will be a syllogism if the terms are related in the same way as before ^c ; and it will be perfect when the apodeictic premiss is attached to the minor term. If the terms

(3) Major particular, minor universal.

C. Syllogisms with one apodeictic and one problematic premiss.

^b 33 a 34 ff.

^c In ch. xv.

85 b

μὲν ὄντων τῶν ὄρων τοῦ ἐνδέχεσθαι καὶ οὐ τοῦ
 ὑπάρχειν ἔσται, καὶ καθόλου καὶ μὴ καθόλου
 τιθεμένων, εἰ δ' ἢ τὸ μὲν καταφατικὸν τὸ δὲ
 80 στερητικόν, ὅταν μὲν ἢ τὸ καταφατικὸν ἀναγκαῖον,
 τοῦ ἐνδέχεσθαι καὶ οὐ τοῦ μὴ ὑπάρχειν, ὅταν δὲ
 τὸ στερητικόν, καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν
 καὶ τοῦ μὴ ὑπάρχειν, καὶ καθόλου καὶ μὴ καθόλου
 τῶν ὄρων ὄντων. τὸ δ' ἐνδέχεσθαι ἐν τῷ συμ-
 περάσματι τὸν αὐτὸν τρόπον ληπτέον ὥνπερ ἐν
 τοῖς πρότερον. τοῦ δ' ἐξ ἀνάγκης μὴ ὑπάρχειν οὐκ
 85 ἔσται συλλογισμὸς· ἕτερον γὰρ τὸ μὴ ἐξ ἀνάγκης
 ὑπάρχειν καὶ τὸ ἐξ ἀνάγκης μὴ ὑπάρχειν.

Ὅτι μὲν οὖν καταφατικῶν ὄντων τῶν ὄρων οὐ
 γίνεταί τὸ συμπέρασμα ἀναγκαῖον, φανερόν. ὑπ-
 αρχέτω γὰρ τὸ Α παρὶ τῷ Β ἐξ ἀνάγκης, τὸ δὲ
 10 Β ἐνδεχέσθω παρὶ τῷ Γ· ἔσται δὴ συλλογισμὸς
 86 α ἀτελής ὅτι ἐνδέχεται τὸ Α παρὶ τῷ Γ ὑπάρχειν.
 ὅτι δ' ἀτελής ἐκ τῆς ἀποδείξεως δῆλον· τὸν αὐτὸν
 γὰρ τρόπον δειχθήσεται ὥνπερ καὶ παρὶ τῶν πρότερον.
 πάλιν τὸ μὲν Α ἐνδεχέσθω παρὶ τῷ Β, τὸ δὲ Β
 παρὶ τῷ Γ ὑπαρχέτω ἐξ ἀνάγκης· ἔσται δὴ συλ-
 8 λογισμὸς ὅτι τὸ Α παρὶ τῷ Γ ἐνδέχεται ὑπάρχειν,
 ἀλλ' οὐχ ὅτι ὑπάρχει, καὶ τέλειος ἀλλ' οὐκ ἀτελής·
 εὐθὺς γὰρ ἐπιτελεῖται διὰ τῶν ἐξ ἀρχῆς προτάσεων.

Εἰ δὲ μὴ ὁμοιοσχήμονες αἱ προτάσεις, ἔστω
 πρῶτον ἡ στερητικὴ ἀναγκαῖα, καὶ τὸ μὲν Α
 μηδενὶ ἐνδεχέσθω τῷ Β [ἐξ ἀνάγκης],¹ τὸ δὲ Β
 10 παρὶ τῷ Γ ἐνδεχέσθω· ἀνάγκη δὴ τὸ Α μηδενὶ τῷ
 Γ ὑπάρχειν. κείσθω γὰρ ὑπάρχειν ἢ παντὶ ἢ τινὶ·
 τῷ δὲ Β ὑπέκειτο μηδενὶ ἐνδέχεσθαι. ἐπεὶ οὖν

¹ ἔσται δὴ Β, Waitz: ἔσται δὲ i: ἔσται Α: ὑπάρχειν C.

² ἐξ ἀνάγκης om. Cn, Alexander: μηδενὶ ὑπάρχει ἐξ ἀνάγκης d.

are positive, whether they are universal or not, the conclusion will be problematic, not assertoric ; if one premiss is affirmative and the other negative, when the affirmative is apodeictic, the conclusion will be problematic, not negative assertoric ; and when the negative is apodeictic, there will be both a problematic and an assertoric negative conclusion, whether the terms are universal or not. The sense of 'possibility' in the conclusion must be understood in the same way as before.^a There will be no inference to the effect that the predicate necessarily does not apply to the subject ; for 'not necessarily to apply' is not the same as 'necessarily not to apply.'

General observations.

Now it is evident that when the terms are positive the conclusion which we get is not apodeictic. For let us assume that A must apply to all B, and B may apply to all C. Then there will be an imperfect syllogism to the effect that A may apply to all C. That it is imperfect is clear from the proof ; for the proof will proceed in the same way as before.^b Again, let us assume that A may apply to all B, and that B must apply to all C. Then there will be a syllogism to the effect that A may apply to all C—not that it *does* apply ; and the syllogism will be perfect, not imperfect ; for it is concluded directly by means of the original premisses.

(1) Both premisses universal.
(a) Both affirmative.

If the premisses are not similar in quality, let us first take the negative premiss as apodeictic ; let us assume that it is impossible for A to apply to any B, and let us assume that B may apply to all C. Then it must follow that A applies to no C. For let us assume that it applies to all or some of C. Now it was assumed that it cannot apply to any B. Then

(b) One affirmative and one negative premiss.

^a Cf. 33 b 30, 34 b 27.

^b 34 a 34 ff.

36 a

ἀντιστρέφει τὸ στερητικόν, οὐδὲ τὸ Β τῷ Α οὐδενὶ ἐνδέχεται· τὸ δὲ Α τῷ Γ ἢ παντὶ ἢ τινὶ κεῖται ὑπάρχειν· ὥστ' οὐδενὶ ἢ οὐ παντὶ τῷ Γ τὸ Β
 15 ἐνδέχοιτ' ἂν ὑπάρχειν· ὑπέκειτο δὲ παντὶ ἐξ ἀρχῆς.

Φανερόν δ' ὅτι καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν γίγνεται συλλογισμός, εἴπερ καὶ τοῦ μὴ ὑπάρχειν· πάλιν ἔστω ἡ καταφατικὴ πρότασις ἀναγκαία, καὶ τὸ μὲν Α ἐνδέχεσθω μηδενὶ τῶν¹ Β ὑπάρχειν, τὸ δὲ Β παντὶ τῷ Γ ὑπαρχέτω ἐξ ἀνάγκης. ὁ μὲν
 20 οὖν συλλογισμὸς ἔσται τέλειος, ἀλλ' οὐ τοῦ μὴ ὑπάρχειν ἀλλὰ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν· ἢ τε γὰρ πρότασις οὕτως ἐλήφθη ἢ ἀπὸ τοῦ μείζονος ἄκρου, καὶ εἰς τὸ ἀδύνατον οὐκ ἔστιν ἀγαγεῖν· εἰ γὰρ ὑποτεθείη τὸ Α τῷ Γ τινὶ² ὑπάρχειν, κεῖται δὲ καὶ τῷ Β ἐνδέχεσθαι μηδενὶ ὑπάρχειν, οὐδὲν
 25 συμβαίνει διὰ τούτων ἀδύνατον. ἐὰν δὲ πρὸς τῷ ἐλάττονι ἄκρῳ τεθῇ τὸ στερητικόν, ὅταν μὲν ἐνδέχεσθαι σημαίῃ συλλογισμὸς ἔσται διὰ τῆς ἀντιστροφῆς, καθάπερ ἐν τοῖς πρότερον, ὅταν δὲ μὴ ἐνδέχεσθαι οὐκ ἔσται· οὐδ' ὅταν ἄμφω μὲν τεθῇ στερητικὰ μὴ ἢ δ' ἐνδεχόμενον τὸ πρὸς τὸ
 30 ἔλαττον. ὅροι δ' οἱ αὐτοί, τοῦ μὲν ὑπάρχειν λευκόν—ζῶον—χιών, τοῦ δὲ μὴ ὑπάρχειν λευκόν—ζῶον—πίττα.

¹ τῷ C.² τῷ Bekker: μηδενὶ codd., Alexander.

* The proof fails because the validating syllogism gives not an apodeictic but an assertoric conclusion (cf. 30 a 15 ff.) which does not contradict the original minor premiss. It is curious that 'the contradictory of A applies to no C' should be stated in the form 'A applies to all or some of C.' Becker

since the negative premiss is convertible, neither can B apply to any A. But it has been assumed that A applies to all or some of C. Therefore B cannot apply to any or all of C. But it was originally assumed that it may apply to all.^a

It is evident that we can have a syllogism of the negative problematic type, since we also have one of the negative assertoric type. Let the affirmative premiss now be apodeictic; and let us assume that A may apply to no B, and that B must apply to all C. Then the syllogism will be perfect, but it will be not of the negative assertoric but of the negative problematic type, for the premiss which relates to the major term was assumed in this sense; and we cannot employ reduction *ad impossibile*. For supposing that we assume that A applies to some C,^b while it is still assumed that A may apply to no B, no impossible conclusion is obtained by means of these assumptions. If, however, the negative is attached to the minor term, when the sense is problematic, there will be a syllogism by conversion, as in the previous examples^c; but when the sense is not problematic there will be no syllogism; nor will there be one when both premisses are taken as negative and the minor is not problematic. The terms are the same as before: where the predicate applies to the subject, white—animal—snow; where it does not, white—animal—pitch.

(A.T.M. p. 44) argues plausibly that the expression represents the expansion of an originally *indefinite* premiss 'A applies to C.'

^b This being the contradictory of the conclusion (A applies to no C) which it is hoped to establish.

^c Cf. 35 a 14, b 1, 7. The resultant syllogism will be the same as in 35 b 38 ff.

- Τὸν αὐτὸν δὲ τρόπον ἔξει καὶ τῶν ἐν μέρει
 συλλογισμῶν· ὅταν γὰρ ἡ τὸ στερητικὸν ἀναγκαῖον,
 καὶ τὸ συμπέρασμα ἔσται τοῦ μὴ ὑπάρχειν. οἷον
 25 εἰ τὸ μὲν Α μηδενὶ τῶν Β ἐνδέχεται ὑπάρχειν τὸ
 δὲ Β τινὶ τῶν Γ ἐνδέχεται ὑπάρχειν, ἀνάγκη τὸ
 Α τινὶ τῶν Γ μὴ ὑπάρχειν. εἰ γὰρ παντὶ ὑπάρχει
 τῷ δὲ Β μηδενὶ ἐνδέχεται, οὐδὲ τὸ Β οὐδενὶ τῷ Α
 ἐνδέχεται ὑπάρχειν· ὥστ' εἰ τὸ Α παντὶ τῷ Γ
 ὑπάρχει, οὐδενὶ τῶν Γ τὸ Β ἐνδέχεται· ἀλλ' ὑπ-
 30 ἐκείτο τινὶ ἐνδέχεσθαι.
- Ὅταν δὲ τὸ ἐν μέρει καταφατικὸν ἀναγκαῖον ἡ
 τὸ ἐν τῷ στερητικῷ συλλογισμῷ, οἷον τὸ ΒΓ, ἡ
 35 τὸ καθόλου ἐν τῷ κατηγορικῷ, οἷον τὸ ΑΒ, οὐκ
 ἔσται τοῦ ὑπάρχειν συλλογισμός· ἀπόδειξις δ' ἡ
 αὐτὴ ἡ καὶ ἐπὶ τῶν πρότερον. εἰ δὲ τὸ μὲν
 καθόλου τεθῇ πρὸς τὸ ἐλάττον ἄκρον,¹ ἡ κατα-
 φατικὸν ἢ στερητικόν, ἐνδεχόμενον, τὸ δ' ἐν μέρει
 40 ἀναγκαῖον [πρὸς τῷ μείζονι ἄκρῳ],² οὐκ ἔσται
 συλλογισμός. ὅροι δὲ τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης
 ζῶον—λευκόν—ἄνθρωπος, τοῦ δὲ μὴ ἐνδέχεσθαι
 ζῶον—λευκόν—ἱμάτιον. ὅταν δ' ἀναγκαῖον ἡ τὸ
 καθόλου τὸ δ' ἐν μέρει ἐνδεχόμενον, στερητικοῦ
 μὲν ὄντος τοῦ καθόλου τοῦ μὲν ὑπάρχειν ὅροι ζῶον
 10 —λευκόν—κόραξ, τοῦ δὲ μὴ ὑπάρχειν ζῶον—
 λευκόν—πίττα, καταφατικοῦ δὲ τοῦ μὲν ὑπάρχειν
 ζῶον—λευκόν—κύκνος, τοῦ δὲ μὴ ἐνδέχεσθαι ζῶον
 —λευκόν—χιών.

Οὐδ' ὅταν ἀδιόριστοι ληφθῶσιν αἱ προτάσεις

¹ τὸ ἐλάττον ἄκρον 'ex optimis libris' Waitz: τῷ ἐλάττονι ἄκρῳ vulgo.

² πρὸς . . . ἄκρῳ om. Adf, secl. Waitz.

The same principle will apply to particular syllogisms.^a When the negative premiss is apodeictic, the conclusion will also be of the negative assertoric type. *E.g.*, if A cannot apply to any B, and B may apply to some C, it must follow that A does not apply to some C. For if A applies to all C, and cannot apply to any B, B too cannot apply to any A; and so if A applies to all C, B cannot apply to any C. But it was assumed that it may apply to some.^b

(2) One universal and one particular premiss.

When the particular affirmative premiss (viz. BC) in the negative, or the universal premiss (viz. AB) in the affirmative syllogism is apodeictic, the conclusion will not be assertoric. The proof is the same as before.^c If the universal premiss, whether affirmative or negative, is problematic and relates to the minor, while the particular premiss is apodeictic and relates to the major term, there will be no syllogism. Examples of terms where the predicate necessarily applies are animal—white—man; where the predicate cannot possibly apply, animal—white—coat. When the universal premiss is apodeictic and the particular problematic, (*a*) if the universal is negative, examples of terms where the predicate applies to the subject are animal—white—crow, and where it does not apply, animal—white—pitch; (*b*) if it is affirmative, examples of terms where the predicate applies are animal—white—swan, and where it cannot possibly apply, animal—white—snow.

Nor will there be a syllogism when the premisses

^a Aristotle passes over the case of particular syllogisms with both premisses affirmative.

^b The proof fails as in the corresponding syllogism at 36 a 7 ff., because the validating syllogism does not give the required contradiction.

^c Cf. 36 a 19-25.

ἢ ἀμφοτέραι κατὰ μέρος, οὐδ' οὕτως ἔσται συλλογισμός. ὅροι δὲ κοινοὶ τοῦ μὲν ὑπάρχειν ζῶον—
 15 λευκόν—ἄνθρωπος, τοῦ δὲ μὴ ὑπάρχειν ζῶον—
 λευκόν—ἄψυχον. καὶ γὰρ τὸ ζῶον τινὶ λευκῷ καὶ
 τὸ λευκὸν ἀψύχῳ τινὶ καὶ ἀναγκαῖον ὑπάρχειν καὶ
 οὐκ ἐνδέχεται ὑπάρχειν. κάπὶ τοῦ ἐνδέχεσθαι
 ὁμοίως, ὥστε πρὸς ἅπαντα χρήσιμοι οἱ ὅροι.

Φανερόν οὖν ἐκ τῶν εἰρημένων ὅτι ὁμοίως
 20 ἐχόντων τῶν ὁρῶν ἐν τε τῷ ὑπάρχειν καὶ ἐν τοῖς
 ἀναγκαίοις γίγνεται τε καὶ οὐ γίγνεται συλλογισμός,
 πλὴν κατὰ μὲν τὸ ὑπάρχειν τιθεμένης τῆς στερη-
 τικῆς προτάσεως τοῦ ἐνδέχεσθαι ἣν ὁ συλλογισμός,
 κατὰ δὲ τὸ ἀναγκαῖον τῆς στερητικῆς καὶ τοῦ
 ἐνδέχεσθαι καὶ τοῦ μὴ ὑπάρχειν. [δῆλον δὲ καὶ
 25 ὅτι πάντες ἀτελεῖς οἱ συλλογισμοὶ καὶ ὅτι τε-
 λειοῦνται διὰ τῶν προειρημένων σχημάτων.]¹

XVII. Ἐν δὲ τῷ δευτέρῳ σχήματι ὅταν μὲν
 ἐνδέχεσθαι λαμβάνωσιν ἀμφοτέραι αἱ προτάσεις,
 οὐδεὶς ἔσται συλλογισμός, οὔτε κατηγορικῶν οὔτε
 στερητικῶν τιθεμένων οὔτε καθόλου οὔτε κατὰ
 μέρος· ὅταν δὲ ἢ μὲν ὑπάρχειν ἢ δ' ἐνδέχεσθαι
 30 σημαίῃ, τῆς μὲν καταφατικῆς ὑπάρχειν σημα-
 νούσης οὐδέποτ' ἔσται, τῆς δὲ στερητικῆς τῆς
 καθόλου αἰεί. τὸν αὐτὸν δὲ τρόπον καὶ ὅταν ἢ μὲν
 ἐξ ἀνάγκης ἢ δ' ἐνδέχεσθαι λαμβάνηται τῶν
 προτάσεων. δεῖ δὲ καὶ ἐν τούτοις λαμβάνειν τὸ
 ἐν τοῖς συμπεράσμασιν ἐνδεχόμενον ὥσπερ ἐν τοῖς
 πρότερον.

¹ secl. Maier.

* This sentence is quite out of place here; it seems to be copied from 39 a 1 (Maier, *Syllogistik*, II. i. 176, note 2).

¹ 33 b 30, 34 b 27, 35 b 32.

PRIOR ANALYTICS, I. XVI-XVII

are taken as indefinite or both as particular. Examples of terms common to all cases where the predicate applies to the subject are animal—white—man; where it does not apply, animal—white—inanimate. For it is at once necessary and impossible both that 'animal' should apply to some things which are white, and that 'white' should apply to some things which are inanimate. Similarly too if the relation is problematic; so the terms are valid for all cases.

(3) Both premisses indefinite or particular.

Thus it is evident from the foregoing analysis that a syllogism does or does not result from a similar relation of the terms in assertoric and in apodeictic propositions; with this qualification, that, as we have seen, if the negative premiss is taken as assertoric the conclusion is problematic, while if the negative premiss is taken as apodeictic, the conclusion is both problematic and negative assertoric. [It is also clear that all the syllogisms are imperfect, and are completed by means of the figures already mentioned.]^a

XVII. In the second figure, when both premisses are problematic, there will be no syllogism, whether they are affirmative or negative, universal or particular; but when one premiss has an assertoric and the other a problematic sense, if it is the affirmative premiss that has the assertoric sense, there will never be a syllogism; but if it is the negative universal premiss, there will always be one. The same holds good when one of the premisses is assumed as apodeictic and the other as problematic. We must understand the sense of 'possibility' in the conclusions in these cases in the same way as before.^b

Second Figure. General observations.

36 b

35 Πρῶτον οὖν δεικτέον ὅτι οὐκ ἀντιστρέφει τὸ ἐν τῷ ἐνδέχεσθαι στερητικόν, ὅλον εἰ τὸ Α ἐνδέχεται μηδενὶ τῷ Β, οὐκ ἀνάγκη καὶ τὸ Β ἐνδέχεσθαι μηδενὶ τῷ Α. κείσθω γὰρ τοῦτο καὶ ἐνδεχέσθω τὸ Β μηδενὶ τῷ Α ὑπάρχειν. οὐκοῦν ἐπεὶ ἀντιστρέφουσιν αἱ ἐν τῷ ἐνδέχεσθαι καταφάσεις ταῖς
40 ἀποφάσεις καὶ αἱ ἐναντίαι καὶ αἱ ἀντικείμεναι, τὸ
37 α δὲ Β τῷ Α ἐνδέχεται μηδενὶ ὑπάρχειν, φανερόν ὅτι καὶ παντὶ ἐνδέχοιτο ἂν τὸ Β τῷ Α ὑπάρχειν. τοῦτο δὲ ψεῦδος· οὐ γὰρ εἰ τότε τῷδε παντὶ ἐνδέχεται, καὶ τότε τῷδε ἀναγκαῖον· ὥστ' οὐκ ἀντιστρέφει τὸ στερητικόν.

Ἔτι δ' οὐδὲν κωλύει τὸ μὲν Α τῷ Β ἐνδέχεσθαι
β μηδενί, τὸ δὲ Β τινὶ τῶν Α ἐξ ἀνάγκης μὴ ὑπάρχειν, ὅλον τὸ μὲν λευκὸν παντὶ ἀνθρώπῳ ἐνδέχεται μὴ ὑπάρχειν (καὶ γὰρ ὑπάρχειν), ἀνθρώπον δ' οὐκ ἀληθὲς εἰπεῖν ὡς ἐνδέχεται μηδενὶ λευκῷ· πολλοῖς γὰρ ἐξ ἀνάγκης οὐχ ὑπάρχει, τὸ δ' ἀναγκαῖον οὐκ ἦν ἐνδεχόμενον.

10 Ἄλλὰ μὲν οὐδ' ἐκ τοῦ ἀδυνάτου δειχθήσεται ἀντιστρέφον, ὅλον εἴ τις ἀξιώσειεν, ἐπεὶ ψεῦδος τὸ ἐνδέχεσθαι τὸ Β τῷ Α μηδενὶ ὑπάρχειν, ἀληθὲς τὸ μὴ ἐνδέχεσθαι μηδενί (φάσις γὰρ καὶ ἀπόφασις), εἰ δὲ τοῦτ', ἀληθὲς ἐξ ἀνάγκης τινὶ τῶν Α τὸ Β

* The meaning of ἀντικείμεναι is very doubtful, but 'contradictories' (Jenkinson) must surely be wrong; no proposition is convertible with its contradictory. Nor indeed is a proposition convertible with its contrary; but since B a A and B e A are contrary propositions in the assertoric mode, it is natural though inaccurate to describe them as such in the problematic mode (Alexander 221. 19). Since the only other problematic propositions which are convertible without change of quantity are the sub-contraries

First we must show that there is no conversion of the negative problematic premiss; e.g., that if A may apply to no B, it does not necessarily follow that B may apply to no A. Let this be assumed; i.e. let us take it that B may apply to no A. Then since affirmations in the problematic sense convert with their negations, whether contrary or opposite,^a and since B may apply to no A, evidently B may also apply to all A. But this is false; for it does not necessarily follow that if one term may apply to all of another, the latter may also apply to all of the former. Therefore the negative (problematic) statement is not convertible.

Negative
problematic
premisses
not
convertible
First proof.

Again, there is no reason why A should not possibly apply to no B, although B necessarily does not apply to some A. E.g., 'white' may not apply to any man (for it may also apply to every man), but it is not true to say that 'man' may apply to nothing that is white; for 'man' necessarily does not apply to many white things, and (as we have seen^b) the necessary is not possible.

Second
proof.

Furthermore, this type of proposition cannot be shown to be convertible by reduction *ad impossibile*, e.g., if it were to be claimed that since it is false^c that B may apply to no A, it is true that it cannot apply to no A, since the latter statement is the contradictory of the former; and if this is so, it is true that B must apply to some A; therefore A

Third proof.

B i A and B o A, and since these are at least verbally opposed to each other (cf. 32 a 32-36, and II. 63 b 23-28, I suggest that they are meant here by ἀντικείμεναι. Alexander notes this possibility (222. 2-4), but without much favour.

^b 32 a 28.

^c Sc. as an inference from the proposition 'A may apply to no B.'

37 a

ὑπάρχειν· ὥστε καὶ τὸ Α τινὶ τῶν Β· τοῦτο δ'
 15 ἀδύνατον.¹ οὐ γὰρ εἰ μὴ ἐνδέχεται μηδενὶ τὸ Β
 τῷ Α, ἀνάγκη τινὶ ὑπάρχειν. τὸ γὰρ μὴ ἐνδέχε-
 σθαι μηδενὶ διχῶς λέγεται, τὸ μὲν εἰ ἐξ ἀνάγκης
 τινὶ ὑπάρχει, τὸ δ' εἰ ἐξ ἀνάγκης τινὶ μὴ ὑπάρχει·
 τὸ γὰρ ἐξ ἀνάγκης τινὶ τῶν Α μὴ ὑπάρχον οὐκ
 ἀληθὲς εἰπεῖν ὡς παντὶ ἐνδέχεται μὴ ὑπάρχειν,
 20 ὥσπερ οὐδὲ τὸ τινὶ ὑπάρχον ἐξ ἀνάγκης ὅτι παντὶ
 ἐνδέχεται ὑπάρχειν. εἰ οὖν τις ἀξιοίῃ, ἐπεὶ οὐκ
 ἐνδέχεται τὸ Γ τῷ Δ παντὶ ὑπάρχειν, ἐξ ἀνάγκης
 τινὶ μὴ ὑπάρχειν αὐτό, ψεῦδος ἂν λαμβάνοι· παντὶ
 γὰρ ὑπάρχει, ἀλλ' ὅτι ἐν ἐνίοις ἐξ ἀνάγκης ὑπάρχει,
 διὰ τοῦτό φημεν οὐ παντὶ ἐνδέχεσθαι. ὥστε τῷ
 25 ἐνδέχεσθαι παντὶ ὑπάρχειν τό τ' ἐξ ἀνάγκης τινὶ
 ὑπάρχειν ἀντίκειται καὶ τὸ ἐξ ἀνάγκης τινὶ μὴ
 ὑπάρχειν· ὁμοίως δὲ καὶ τῷ ἐνδέχεσθαι μηδενί.

Δήλον οὖν ὅτι πρὸς τὸ οὕτως ἐνδεχόμενον καὶ
 μὴ ἐνδεχόμενον, ὡς ἐν ἀρχῇ διωρίσαμεν, οὐ μόνον²
 τὸ ἐξ ἀνάγκης τινὶ ὑπάρχειν ἀλλὰ καὶ³ τὸ ἐξ
 ἀνάγκης τινὶ μὴ ὑπάρχειν ληπτέον· τούτου δὲ
 30 ληφθέντος οὐδὲν συμβαίνει ἀδύνατον, ὥστ' οὐ
 γίγνεται συλλογισμός. φανερόν οὖν ἐκ τῶν εἰρη-
 μένων ὅτι οὐκ ἀντιστρέφει τὸ στερητικόν.

Τούτου δὲ δειχθέντος κείσθω τὸ Α τῷ μὲν Β
 ἐνδέχεσθαι μηδενὶ τῷ δὲ Γ παιτί. διὰ μὲν οὖν
 τῆς ἀντιστροφῆς οὐκ ἔσται συλλογισμός· εἴρηται

¹ τῶν Β· τοῦτο δ' ἀδύνατον. Maier: τῶν Β. τοῦτο δ'
 ἀδύνατον uolgo.

² μόνον om. AC.

³ καὶ om. Af.

must also apply to some B ; but this is impossible. <The reasoning is unsound,> because it does not follow that if B cannot apply to no A, it must apply to some. For there are two senses in which we say that it is not possible for a predicate to apply to none of a subject, viz. (a) if it necessarily applies to some, and (b) if it necessarily does not apply to some. For it is not true to say that that which necessarily does not apply to some As may not apply to every A, any more than it is true that that which necessarily applies to some may apply to all. Thus if it should be claimed that since it is not possible that C should apply to all D, it necessarily does not apply to some, the assumption would be false ; for it does apply to all, but because in some cases it applies necessarily, for this reason we say that it is not *possible* for it to apply to all. Thus to the proposition 'A may apply to all B' is opposed not only 'A must not apply to some B' but also 'A must apply to some B'; and similarly with the proposition 'A may apply to no B.'

Thus it is clear that we must regard as opposed to that which is possible or not possible in the sense which we originally defined,^a not only that which necessarily applies to some, but also that which necessarily does not apply to some ; and if we do this, no impossible conclusion follows <in the foregoing example>, and so no syllogism results. Thus it is evident from what has been said that the negative <problematic> premiss is not convertible.

Now that this has been proved, let it be assumed that A may apply to no B, but to all C. Then there will be no syllogism by means of conversion ; for it

A. Both
premisses
problem-
atic.

^a 32 a 18.

87^a

85 γὰρ ὅτι οὐκ ἀντιστρέφει ἡ τοιαύτη πρότασις. ἀλλ' οὐδὲ διὰ τοῦ ἀδυνάτου· τεθέντος γὰρ τοῦ Β παντὶ τῷ Γ ἐνδέχεσθαι ὑπάρχειν¹ οὐδὲν συμβαίνει ψεῦδος· ἐνδέχοιτο γὰρ ἂν τὸ Α τῷ Γ καὶ παντὶ καὶ μηδενὶ ὑπάρχειν. ὅλως δ' εἰ ἔστι συλλογισμός, δῆλον ὅτι τοῦ ἐνδέχεσθαι ἂν εἴη (διὰ τὸ μηδετέραν τῶν προ-
 40 τάσεων εἰληφθαι ἐν τῷ ὑπάρχειν), καὶ οὗτος ἡ
 87^b καταφατικός ἢ στερητικός· οὐδετέρως δ' ἐγχωρεῖ. καταφατικοῦ μὲν γὰρ τεθέντος δειχθήσεται διὰ τῶν ὄρων ὅτι οὐκ ἐνδέχεται ὑπάρχειν, στερητικοῦ δὲ ὅτι τὸ συμπέρασμα οὐκ ἐνδεχόμενον ἀλλ' ἀναγκαῖόν ἐστιν. ἔστω γὰρ τὸ μὲν Α λευκὸν τὸ δὲ Β
 6 ἄνθρωπος ἐφ' ᾧ δὲ Γ ἵππος· τὸ δὴ Α, τὸ λευκόν, ἐνδέχεται τῷ μὲν παντὶ τῷ δὲ μηδενὶ ὑπάρχειν, ἀλλὰ τὸ Β τῷ Γ οὔτε ὑπάρχειν ἐνδέχεται οὔτε μὴ ὑπάρχειν. ὅτι μὲν οὖν ὑπάρχειν οὐκ ἐγχωρεῖ φανερόν, οὐδεὶς γὰρ ἵππος ἄνθρωπος· ἀλλ' οὐδ' ἐνδέχεσθαι μὴ ὑπάρχειν, ἀνάγκη γὰρ μηδένα ἵππον
 10 ἄνθρωπον εἶναι, τὸ δ' ἀναγκαῖον οὐκ ἦν ἐνδεχόμενον. οὐκ ἄρα γίνεται συλλογισμός.

Ὅμοίως δὲ δειχθήσεται καὶ ἂν ἀνάπαλιν τεθῇ τὸ στερητικόν, κἂν ἀμφότεραι καταφατικαὶ ληφθῶσιν ἢ στερητικαί· διὰ γὰρ τῶν αὐτῶν ὄρων ἔσται ἡ ἀπόδειξις. καὶ ὅταν ἡ μὲν καθόλου ἢ δ' ἐν μέρει, ἢ ἀμφότεραι κατὰ μέρος ἢ ἀδιόριστοι,
 15 ἢ ὅσαχῶς ἄλλως ἐνδέχεται μεταλαβεῖν τὰς προ-

¹ παντὶ] μὴ παντὶ Maier.

² ὑπάρχειν] μὴ ὑπάρχειν Maier.

* i.e. the major premiss AB.

* The sense is clearly wrong. This premiss must be intended to contradict the conclusion (B may apply to no C) which it is required to establish. The true contradictory would be 'B must apply to some C'; this when combined with the

has been already observed that such a premiss as this ^a is not convertible. Nor, again, will there be a syllogism by reduction *ad impossibile*; for if it is assumed that B may apply to all C ^b no falsity results, because A might apply both to all and to none of C. In fine, if there is a syllogism with these premisses, clearly it will be problematic, since neither of the premisses is taken in an assertoric sense; and this syllogism will be either affirmative or negative. But neither alternative is admissible; for if it is assumed to be affirmative, it can be shown by examples of terms that the predicate does not apply to the subject, and if to be negative, that the conclusion is not problematic but apodeictic. Let A be 'white,' B 'man' and C 'horse.' Then A, *i.e.* white, may apply to all of the one and to none of the other; but it is not possible either that B should or should not apply to C. That it is not possible that it should apply is evident, for no horse is a man. But neither is it possible that it should not apply; for it is necessary that no horse should be a man, and the necessary, as we have seen,^c is not possible. Hence no syllogism results.

There will be a similar proof if the negative is taken with the other premiss instead, or if both premisses are taken as affirmative or both as negative; for the proof will be drawn from the same terms. The same holds good when one premiss is universal and the other particular, or when both are particular or indefinite, or for any other possible combination major premiss would give 'A may not apply to some C,' which is not incompatible with the minor premiss. Maier's emendation gives the right sense, but it has no support from MSS. or commentators, and is at best a clumsy and unnatural form of expression.

^c 32 a 28.

37 b

τάσεις· αἰεὶ γὰρ ἔσται διὰ τῶν αὐτῶν ὄρων ἡ ἀπόδειξις. φανερόν οὖν ὅτι ἀμφοτέρων τῶν προτάσεων κατὰ τὸ ἐνδέχασθαι τιθεμένων οὐδεὶς γίγνεται συλλογισμός.

XVIII. Εἰ δ' ἡ μὲν ὑπάρχειν ἢ δ' ἐνδέχασθαι
 20 σημαίνει, τῆς μὲν κατηγορικῆς ὑπάρχειν τεθείσης τῆς δὲ στερητικῆς ἐνδέχασθαι οὐδέποτε ἔσται συλλογισμός, οὔτε καθόλου τῶν ὄρων οὐτ' ἐν μέρει λαμβανομένων· ἀπόδειξις δ' ἡ αὐτὴ καὶ διὰ τῶν αὐτῶν ὄρων. ὅταν δ' ἡ μὲν καταφατικὴ ἐνδέχασθαι ἢ δὲ στερητικὴ ὑπάρχειν, ἔσται συλλο-
 25 γισμός. εἰλήφθω γὰρ τὸ Α τῷ μὲν Β μηδενὶ ὑπάρχειν τῷ δὲ Γ παιτὶ ἐνδέχασθαι. ἀντιστραφέντος οὖν τοῦ στερητικοῦ τὸ Β τῷ Α οὐδεὶς ὑπάρξει· τὸ δὲ Α παιτὶ τῷ Γ ἐνεδέχεται· γίγνεται δὴ συλλογισμός ὅτι ἐνδέχεται τὸ Β μηδενὶ τῷ Γ διὰ τοῦ πρώτου σχήματος. ὁμοίως δὲ καὶ εἰ πρὸς τῷ Γ τεθείη τὸ στερητικόν.

80 Ἐὰν δ' ἀμφότεραι μὲν ὥσι στερητικαί, σημαίνει δ' ἡ μὲν μὴ ὑπάρχειν ἢ δ' ἐνδέχασθαι μὴ ὑπάρχειν, δι' αὐτῶν μὲν τῶν εἰλημμένων οὐδὲν συμβαίνει ἀναγκαῖον, ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχασθαι προτάσεως γίγνεται συλλογισμός ὅτι τὸ Β τῷ Γ ἐνδέχεται μηδενὶ ὑπάρχειν, καθάπερ ἐν
 85 τοῖς πρότερον· ἔσται γὰρ πάλιν τὸ πρῶτον σχῆμα. ἔὰν δ' ἀμφότεραι τεθῶσι κατηγορικαί, οὐκ ἔσται συλλογισμός. ὅροι τοῦ μὲν ὑπάρχειν ὑγίεια—ζῶον—ἄνθρωπος, τοῦ δὲ μὴ ὑπάρχειν ὑγίεια—ἵππος—ἄνθρωπος.

Τον αὐτὸν δὲ τρόπον ἔξει καπὶ τῶν ἐν μέρει
 40 συλλογισμῶν. ὅταν μὲν γὰρ ἡ τὸ καταφατικόν

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of premisses ; for the proof will always be drawn from the same terms. Thus it is evident that if both the premisses are taken as problematic, no syllogism results.

XVIII. If, however, one premiss has an assertoric and the other a problematic sense, when the affirmative is assumed as assertoric and the negative as problematic there will never be a syllogism, whether the terms are taken as universal or as particular. The proof will be the same as before, and drawn from the same terms. But when the affirmative is problematic and the negative assertoric there will be a syllogism. Let it be assumed that A applies to no B but may apply to all C. Then if the negative premiss is converted, B will apply to no A. But it was assumed that A may apply to all C. Therefore a syllogism results by means of the first figure,^a to the effect that B may apply to no C. Similarly too if the negative be attached to C.^b

B. One assertoric and one problematic premiss.
(1) Both premisses universal.

If both premisses are negative, one having a negative assertoric and the other a negative problematic sense, no necessary conclusion results by means of the assumptions as they are ; but on the conversion of the problematic premiss a syllogism results to the effect that B may apply to no C, as in the previous example ; for once again we shall have the first figure. If, however, both premisses are taken as affirmative, there will be no syllogism. Examples of terms where the predicate applies to the subject are health—animal—man ; where it does not apply, health—horse—man.

The same principle will also obtain in the case of particular syllogisms. When it is the affirmative

(2) One premiss particular.

^a 34 b 19 ff.

^b 35 a 6 ff.

28 α ὑπάρχον, εἴτε καθόλου εἴτ' ἐν μέρει ληφθέν, οὐδείς
 ἔσται συλλογισμὸς (τοῦτο δ' ὁμοίως καὶ διὰ τῶν
 αὐτῶν ὄρων δείκνυται τοῖς πρότερον), ὅταν δὲ τὸ
 στερητικόν, ἔσται διὰ τῆς ἀντιστροφῆς, καθάπερ
 ἐν τοῖς πρότερον. πάλιν ἐὰν ἄμφω μὲν τὰ δια-
 8 στήματα στερητικὰ ληφθῇ, καθόλου δὲ τὸ μὴ
 ὑπάρχειν, ἐξ αὐτῶν μὲν τῶν προτάσεων οὐκ ἔσται
 τὸ ἀναγκαῖον, ἀντιστραφέντος δὲ τοῦ ἐνδέχεσθαι,
 καθάπερ ἐν τοῖς πρότερον, ἔσται συλλογισμὸς.

Ἐὰν δὲ ὑπάρχον μὲν ἢ τὸ στερητικόν ἐν μέρει δὲ
 ληφθῇ, οὐκ ἔσται συλλογισμὸς οὔτε καταφατικῆς
 10 οὔτε στερητικῆς οὔσης τῆς ἐτέρας προτάσεως· οὐδ'
 ὅταν ἀμφότεραι ληφθῶσιν ἀδιόριστοι, ἢ κατα-
 φατικαὶ ἢ ἀποφατικαί, ἢ κατὰ μέρος. ἀπόδειξις
 δ' ἢ αὐτὴ καὶ διὰ τῶν αὐτῶν ὄρων.

XIX. Ἐὰν δ' ἢ μὲν ἐξ ἀνάγκης ἢ δ' ἐνδέχεσθαι
 σημαίνει τῶν προτάσεων, τῆς μὲν στερητικῆς
 15 ἀναγκαίας οὔσης ἔσται συλλογισμὸς οὐ μόνον ὅτι
 ἐνδέχεται μὴ ὑπάρχειν ἀλλὰ καὶ ὅτι οὐχ ὑπάρχει·
 τῆς δὲ καταφατικῆς οὐκ ἔσται. κείσθω γὰρ τὸ
 Α τῷ μὲν Β ἐξ ἀνάγκης μηδενὶ ὑπάρχειν, τῷ
 δὲ Γ παντὶ ἐνδέχεσθαι. ἀντιστραφείσης οὖν τῆς
 στερητικῆς οὐδὲ τὸ Β τῷ Α οὐδενὶ ὑπάρξει· τὸ
 20 δὲ Α παντὶ τῷ Γ ἐνεδέχετο· γίγνεται δὴ πάλιν διὰ
 τοῦ πρώτου σχήματος ὁ συλλογισμὸς ὅτι τὸ Β τῷ
 Γ ἐνδέχεται μηδενὶ ὑπάρχειν. ἅμα δὲ δῆλον ὅτι
 οὐδ' ὑπάρχει¹ τὸ Β οὐδενὶ τῶν Γ. κείσθω γὰρ
 ὑπάρχειν· οὐκοῦν εἰ τὸ Α τῷ Β μηδενὶ ἐνδέχεται

¹ ὑπάρξει Cn, Bekker.

statement that is assertoric, whether it is taken as universal or as particular, there will be no syllogism (this can be proved by the same method and the same terms as before) ; but when it is the negative,^a there will be a syllogism by conversion, as in the previous examples. On the other hand, if both propositions are taken as negative and the negative assertoric is universal, no necessary conclusion will result from the premisses as they stand, but when the problematic statement is converted there will be a syllogism, as before.

If the negative statement is assertoric and taken as particular, there will be no syllogism, whether the other premiss is affirmative or negative ; nor will there be a syllogism when both are taken as indefinite, whether affirmative or negative ; or as particular. The proof is the same and is effected by the same terms.

XIX. If one premiss is apodeictic and the other has a problematic sense, when it is the negative premiss that is apodeictic, there will be a syllogism, not only to the effect that the predicate may not apply to the subject, but also that it does not apply ; but when it is the affirmative premiss, there will be no syllogism. For let it be assumed that A necessarily applies to no B, but may apply to all C. Then by the conversion of the negative premiss, B will also apply to no A ; and it was assumed that A may apply to all C. Thus once again by means of the first figure a syllogism results to the effect that B may apply to no C.^b Moreover it is obvious also that B does not apply to any C. For let it be assumed that it does apply. Then if A cannot apply to any B,

C. One apodeictic and one problematic premiss.
(1) Universal syllogisms.
(a) One affirmative and one negative premiss.

^a Sc. universal.

^b Cf. 36 a 15 ff.

33 a

τὸ δὲ Β ὑπάρχει τινὶ τῶν Γ, τὸ Α τῶν Γ τινὶ οὐκ
 25 ἐνδέχεται· ἀλλὰ παντὶ ὑπέκειτο ἐνδέχεσθαι.

Τὸν αὐτὸν δὲ τρόπον δειχθήσεται καὶ εἰ πρὸς τῷ
 Γ τεθείη τὸ στερητικόν.

Πάλιν ἔστω τὸ κατηγορικὸν ἀναγκαῖον θάτερον
 δ' ἐνδεχόμενον, καὶ τὸ Α τῷ μὲν Β ἐνδεχέσθω
 μηδενὶ τῷ δὲ Γ παντὶ ὑπαρχέτω ἐξ ἀνάγκης.
 οὕτως οὖν ἐχόντων τῶν ὄρων οὐδεὶς ἔσται συλ-
 30 λογισμός· συμβαίνει γὰρ τὸ Β τῷ Γ ἐξ ἀνάγκης
 μὴ ὑπάρχειν. ἔστω γὰρ τὸ μὲν Α λευκὸν ἐφ' ᾧ
 δὲ τὸ Β ἄνθρωπος ἐφ' ᾧ δὲ τὸ Γ κύκνος· τὸ δὴ
 λευκὸν κύκνῳ μὲν ἐξ ἀνάγκης ὑπάρχει ἀνθρώπῳ
 δ' ἐνδέχεται μηδενί, καὶ ἄνθρωπος οὐδενὶ κύκνῳ
 ἐξ ἀνάγκης. ὅτι μὲν οὖν τοῦ ἐνδέχεσθαι οὐκ
 35 ἔστι συλλογισμὸς φανερόν· τὸ γὰρ ἐξ ἀνάγκης
 οὐκ ἦν ἐνδεχόμενον.

Ἄλλὰ μὴν οὐδὲ τοῦ ἀναγκαίου· τὸ γὰρ ἀνα-
 καῖον ἢ ἐξ ἀμφοτέρων ἀναγκαίων ἢ ἐκ τῆς στερη-
 τικῆς συνέβαινεν. ἔτι δὲ καὶ ἐγχωρεῖ τούτων
 κειμένων τὸ Β τῷ Γ ὑπάρχειν· οὐδὲν γὰρ κωλύει
 40 τὸ μὲν Γ ὑπὸ τὸ Β εἶναι τὸ δὲ Α τῷ μὲν Β παντὶ
 ἐνδέχεσθαι τῷ δὲ Γ ἐξ ἀνάγκης ὑπάρχειν, οἷον εἰ
 τὸ μὲν Γ εἴη ἐγρηγορὸς τὸ δὲ Β ζῶον τὸ δ' ἐφ'
 38 b ᾧ Α κίνησις· τῷ μὲν γὰρ ἐγρηγορότι ἐξ ἀνάγκης
 κίνησις, ζῶῳ δὲ παντὶ ἐνδέχεται, καὶ πᾶν τὸ
 ἐγρηγορὸς ζῶον. φανερόν οὖν ὅτι οὐδὲ τοῦ μὴ
 ὑπάρχειν, εἴπερ οὕτως ἐχόντων ἀνάγκη ὑπάρχειν.

and B applies to some C, A cannot possibly apply to some C.^a But it was assumed that it may apply to all.

The proof can also be effected in the same way supposing that the negative be attached to C.

On the other hand, let the affirmative statement be apodeictic and the other problematic: let A possibly apply to no B, and necessarily apply to all C. Then when the terms are in this relation there will be no syllogism; for it can so happen that B necessarily does not apply to C. *E.g.*, let A be 'white,' B 'man' and C 'swan.' Then white necessarily applies to swan, but may apply to no man; and 'man' necessarily applies to no swan. Thus it is evident that there is no syllogism of the problematic type; for we have seen^b that the necessary is not possible.

Nor again will there be an apodeictic syllogism; for we saw^c that an apodeictic conclusion (only) results when both premisses are apodeictic, or when the negative premiss is apodeictic. Again, it is possible, with the terms taken in this way, for B to apply to C. For there is no reason why C should not fall under B in such a way that A may apply to all B, but must apply to all C; *e.g.*, if C were 'waking,' B 'animal' and A 'motion'; for that which is awake must have motion, and every animal may have motion, and every waking thing is an animal. Thus it is evident that there is no negative assertoric conclusion either, since with this arrangement of terms the conclusion is assertoric and affirmative.

^a This is a fallacy. *Cf.* note on 36 a 15.

^b 32 a 28.

^c 30 b 7, 31 a 21.

38 b

οὐδέ δὴ τῶν ἀντικειμένων καταφάσεων,¹ ὥστ' οὐδεὶς ἔσται συλλογισμός.

3 'Ομοίως δὲ δειχθήσεται καὶ ἀνάπαλιν τεθείσης τῆς καταφατικῆς.

10 'Εὰν δ' ὁμοιοσχήμονες ὦσιν αἱ προτάσεις, στερητικῶν μὲν οὐσῶν αἰεὶ γίγνεται συλλογισμὸς ἀντιστραφείσης τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, καθάπερ ἐν τοῖς πρότερον. εἰλήφθω γὰρ τὸ Α τῷ μὲν Β ἐξ ἀνάγκης μὴ ὑπάρχειν, τῷ δὲ Γ ἐνδέχεσθαι μὴ ὑπάρχειν· ἀντιστραφείσων οὖν τῶν προτάσεων τὸ μὲν Β τῷ Α οὐδενὶ ὑπάρχει τὸ δὲ Α παντὶ τῷ Γ ἐνδέχεται· γίγνεται δὴ τὸ πρῶτον σχῆμα. κἂν εἰ πρὸς τῷ Γ τεθείη τὸ στερητικὸν ὡσαύτως.

15 'Εὰν δὲ κατηγορικαὶ τεθῶσιν, οὐκ ἔσται συλλογισμός. τοῦ μὲν γὰρ μὴ ὑπάρχειν ἢ τοῦ ἐξ ἀνάγκης μὴ ὑπάρχειν φανερόν ὅτι οὐκ ἔσται διὰ τὸ μὴ εἰληφθαι στερητικὴν πρότασιν μήτ' ἐν τῷ ὑπάρχειν μήτ' ἐν τῷ ἐξ ἀνάγκης ὑπάρχειν. ἀλλὰ μὴν οὐδὲ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν· ἐξ ἀνάγκης γὰρ οὕτως ἐχόντων τὸ Β τῷ Γ οὐχ ὑπάρξει, οἷον 20 εἰ τὸ μὲν Α τεθείη λευκὸν ἐφ' ᾧ δὲ τὸ Β κύκνος τὸ δὲ Γ ἄνθρωπος. οὐδέ γε τῶν ἀντικειμένων καταφάσεων,² ἐπεὶ δέδεικται τὸ Β τῷ Γ ἐξ ἀνάγκης οὐχ ὑπάρχον. οὐκ ἄρα γίγνεται συλλογισμὸς ὅλως.

'Ομοίως δ' ἔξει καπὶ τῶν ἐν μέρει συλλογισμῶν·

¹ καταφάσεων n, Alexander, Waitz: φάσεων.

² καταφάσεων Alexander, Waitz: καταφάσεων καὶ ἀποφάσεων n: ἀποφάνσεων A³BCum: ἀντιφάσεων A¹: ἀντιφάσεων d: ἀποφάσεων f.

Nor again is there a conclusion which takes the form of any of the opposite statements.^a Therefore there will be no syllogism.

There will be a similar proof if the affirmative premiss occupies the other position.

If the premisses are similar in quality, where they are negative a syllogism always results on the conversion of the problematic premiss, as before. Let it be assumed that A necessarily does not apply to B, and may not apply to C. Then on the conversion of the premisses B applies to no A, and A may apply to all C. Thus the first figure results. Similarly also if the negative statement relates to C.^b

If, however, the premisses are taken as affirmative, there will be no syllogism. It is evident that there will be none of the negative assertoric or of the negative apodeictic type, since no negative premiss has been assumed, either in the assertoric or in the apodeictic sense. Furthermore, there will be none of the negative problematic type; for with the terms in this relation B will necessarily not apply to C; *e.g.*, if A is taken to be 'white,' B 'swan' and C 'man.' Nor can we conclude any of the opposite affirmations, because we have shown ^c that B necessarily does not apply to C. Thus no syllogism at all results.

The same will also hold good in the case of particular syllogisms.⁽²⁾

^a Aristotle has proved that in each of the three modes a negative conclusion is impossible; he now adds that the corresponding affirmatives are also impossible (*sc.* because an affirmative conclusion can only be drawn from two affirmative premisses).

^b *i.e.*, if the minor premiss is apodeictic. The problematic premiss is originally negative, but becomes affirmative by conversion.

^c By the examples just cited.

38 b

20 ὅταν μὲν γὰρ ἡ τὸ στερητικὸν καθόλου τε καὶ ἀναγκαῖον, αἰὲ συλλογισμὸς ἔσται καὶ τοῦ ἐνδέχεσθαι καὶ τοῦ μὴ ὑπάρχειν (ἀπόδειξις δὲ διὰ τῆς ἀντιστροφῆς), ὅταν δὲ τὸ καταφατικόν, οὐδέποτε· τὸν αὐτὸν γὰρ τρόπον δειχθήσεται ὅν καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὅρων.

30 Οὐδ' ὅταν ἀμφότεραι ληφθῶσι καταφατικά· καὶ γὰρ τούτου ἡ αὐτὴ ἀπόδειξις ἢ καὶ πρότερον.

Ὅταν δὲ ἀμφότεραι μὲν στερητικαὶ καθόλου δὲ καὶ ἀναγκαῖα ἢ τὸ μὴ ὑπάρχειν σημαίνουσα, δι' αὐτῶν μὲν τῶν εἰλημμένων οὐκ ἔσται τὸ ἀναγκαῖον, ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως ἔσται συλλογισμὸς, καθάπερ ἐν τοῖς πρότερον.

Ἐὰν δ' ἀμφότεραι ἀδιόριστοι ἢ ἐν μέρει τεθῶσιν, οὐκ ἔσται συλλογισμὸς· ἀπόδειξις δ' ἢ αὐτὴ καὶ διὰ τῶν αὐτῶν ὅρων.

Φανερόν οὖν ἐκ τῶν εἰρημένων ὅτι τῆς μὲν στερητικῆς τῆς καθόλου τιθεμένης ἀναγκαίας αἰὲ γίγνεται συλλογισμὸς, οὐ μόνον τοῦ ἐνδέχεσθαι
40 μὴ ὑπάρχειν ἀλλὰ καὶ τοῦ μὴ ὑπάρχειν, τῆς δὲ καταφατικῆς οὐδέποτε· καὶ ὅτι τὸν αὐτὸν τρόπον
39 α ἐχόντων ἐν τε τοῖς ἀναγκαίοις καὶ ἐν τοῖς ὑπάρχουσι γίγνεται τε καὶ οὐ γίγνεται συλλογισμὸς. δῆλον δὲ καὶ ὅτι πάντες ἀτελεῖς οἱ συλλογισμοί, καὶ ὅτι τελειοῦνται διὰ τῶν προειρημένων σχημάτων.

* A fallacy; cf. notes on 36 a 15, 38 a 24.

^b 38 a 26-b 4.

^c 38 b 13-23.

^d Cf. 36 b 12-18.

* Cf. 36 a 15, 38 a 24, b 26.

^f Actually by the first figure only.

ticular syllogisms. When the negative statement is universal and apodeictic, a syllogism will always result to give both a problematic and a negative assertoric ^a conclusion (the proof will proceed by conversion); but when the affirmative statement is universal and apodeictic, there will never be a syllogism. The proof will be effected in the same way as in universal syllogisms, and by means of the same terms.^b

Nor will there be a syllogism when both premisses are taken as affirmative. The proof of this also is the same as before.^c

When, however, both premisses are negative, and that which has the non-attributive sense is universal and apodeictic, although there will be no necessary conclusion from the assumptions as they are, when the problematic premiss is converted there will be a syllogism, as before.

If, however, both premisses are assumed as indefinite or particular, there will be no syllogism. The proof is the same as before, and is effected by means of the same terms.^d

Thus it is evident from the foregoing analysis (a) that when the negative universal premiss is taken as apodeictic a syllogism always results, giving not only a conclusion of the negative problematic type but also one of the negative assertoric type,^e but when the affirmative universal premiss is so taken a syllogism never results; (b) that a syllogism results or does not result from the same arrangement of terms in apodeictic as in assertoric propositions. It is obvious also that all these syllogisms are imperfect, and that they are completed by means of the figures ^f already mentioned.

General deductions.

XX. Ἐν δὲ τῷ τελευταίῳ σχήματι καὶ ἀμφο-
 5 τέρων ἐνδεχομένων καὶ τῆς ἐτέρας ἔσται συλ-
 λογισμός. ὅταν μὲν οὖν ἐνδέχεσθαι σημαίνωσιν
 αἱ προτάσεις, καὶ τὸ συμπέρασμα ἔσται ἐνδεχό-
 μενον· καὶ ὅταν ἡ μὲν ἐνδέχεσθαι ἡ δ' ὑπάρχειν.
 ὅταν δ' ἡ ἐτέρα τεθῇ ἀναγκαία, εἴαν μὲν ἡ κατα-
 10 φατική, οὐκ ἔσται τὸ συμπέρασμα οὔτε ἀναγ-
 καῖον οὔθ' ὑπάρχον, εἴαν δ' ἡ στερητική, τοῦ μὴ
 ὑπάρχειν ἔσται συλλογισμός, καθάπερ καὶ ἐν τοῖς
 πρότερον. ληπτέον δὲ καὶ ἐν τούτοις ὁμοίως τὸ
 ἐν τοῖς συμπεράσμασιν ἐνδεχόμενον.

Ἔστωσαν δὴ πρῶτον ἐνδεχόμεναι, καὶ τὸ Α
 15 καὶ τὸ Β παντὶ τῷ Γ ἐνδεχέσθω ὑπάρχειν. ἐπεὶ
 οὖν ἀντιστρέφει τὸ καταφατικὸν ἐπὶ μέρους τὸ
 δὲ Β παντὶ τῷ Γ ἐνδέχεται, καὶ τὸ Γ τινὶ τῷ Β
 ἐνδέχοιτ' ἂν ὥστ' εἰ τὸ μὲν Α παντὶ τῷ Γ ἐν-
 δέχεται τὸ δὲ Γ τινὶ τῶν Β, καὶ τὸ Α τινὶ τῶν Β ἐν-
 20 δέχεται· γίννεται γὰρ τὸ πρῶτον σχῆμα. καὶ εἰ
 τὸ μὲν Α ἐνδέχεται μηδενὶ τῷ Γ ὑπάρχειν τὸ δὲ Β
 παντὶ τῷ Γ, ἀνάγκη τὸ Α τινὶ τῷ Β ἐνδέχεσθαι
 μὴ ὑπάρχειν· ἔσται γὰρ πάλιν τὸ πρῶτον σχῆμα
 διὰ τῆς ἀντιστροφῆς. εἰ δ' ἀμφότεραι στερητικαὶ
 τεθείησαν, ἐξ αὐτῶν μὲν τῶν εἰλημμένων οὐκ
 25 ἔσται τὸ ἀναγκαῖον, ἀντιστραφείσων δὲ τῶν
 προτάσεων ἔσται συλλογισμός, καθάπερ ἐν τοῖς
 πρότερον. εἰ γὰρ τὸ Α καὶ τὸ Β τῷ Γ ἐνδέχεται
 μὴ ὑπάρχειν, εἴαν μεταληφθῇ τὸ ἐνδέχεσθαι μὴ
 ὑπάρχειν, πάλιν ἔσται τὸ πρῶτον σχῆμα διὰ τῆς
 ἀντιστροφῆς.

Εἰ δ' ὁ μὲν ἐστὶ καθόλου τῶν ὄρων ὁ δ' ἐν μέρει,
 30 τὸν αὐτὸν τρόπον ἐχόντων τῶν ὄρων ὥνπερ ἐπὶ

¹ μὴ n: om. cett.

XX. In the last figure when both premisses are problematic, and also when only one is problematic, there will be a syllogism. When both the premisses have a problematic sense the conclusion will also be problematic, and likewise when one premiss is problematic and the other assertoric. When, however, the other premiss is apodeictic, if it is affirmative, the conclusion will be neither apodeictic nor assertoric; but if it is negative, there will be a negative assertoric conclusion, as before.^a In these syllogisms also the sense of 'possibility' in the conclusions must be understood in the same way as before.^b

Third
Figure.
General
remarks.

First, then, let the premisses be problematic, and let both A and B possibly apply to all C. Then since the affirmative statement is convertible as particular, and since B may apply to all C, C may also apply to some B. Thus if A may apply to all C, and C to some B, A may also apply to some B; for we get the first figure. And if A may apply to no C, and B may apply to all C, it necessarily follows that A may not apply to some B; for again we shall have the first figure by conversion. But supposing that both premisses are assumed as negative, there will be no necessary conclusion from the assumptions as they stand, but when the premisses are converted there will be a syllogism, as before; for if both A and B may not apply to C, if we substitute in each case the expression 'may apply,' we shall have the first figure again by conversion.

A. Both
premisses
problem-
atic.
(1) Universal
syllogisms.

If one of the terms is universal and the other particular, there will or will not be a syllogism with

(2) Particular syllogisms.

^a Cf. 36 a 15, 38 a 24, b 26, 40.

^b 33 b 30, 34 b 27, 35 b 32, 36 b 33.

89 a

τοῦ ὑπάρχειν ἔσται τε καὶ οὐκ ἔσται συλλογισμός.
 ἐνδεχέσθω γὰρ τὸ μὲν Α παντὶ τῷ Γ τὸ δὲ Β τινὶ
 τῷ Γ ὑπάρχειν· ἔσται δὴ πάλιν τὸ πρῶτον σχῆμα
 τῆς ἐν μέρει προτάσεως ἀντιστραφείσης· εἰ γὰρ
 τὸ Α παντὶ τῷ Γ τὸ δὲ Γ τινὶ τῶν Β, τὸ Α τινὶ
 τῶν Β ἐνδέχεται. καὶ εἰ πρὸς τῷ¹ ΒΓ τεθείη τὸ
 καθόλου, ὡσαύτως. ὁμοίως δὲ καὶ εἰ τὸ μὲν ΑΓ
 στερητικὸν εἴη τὸ δὲ ΒΓ καταφατικόν· ἔσται γὰρ
 πάλιν τὸ πρῶτον σχῆμα διὰ τῆς ἀντιστροφῆς.

Εἰ δ' ἀμφότεραι στερητικαὶ τεθείησαν, ἡ μὲν
 καθόλου ἡ δ' ἐν μέρει, δι' αὐτῶν μὲν τῶν εἰλημ-
 39 b μένων οὐκ ἔσται συλλογισμός, ἀντιστραφειῶν δ'
 ἔσται, καθάπερ ἐν τοῖς πρότερον.

Ὅταν δὲ ἀμφότεραι ἀδιόριστοι ἡ ἐν μέρει
 ληφθῶσιν οὐκ ἔσται συλλογισμός· καὶ γὰρ παντὶ
 ἀνάγκη τὸ Α τῷ Β καὶ μηδενὶ ὑπάρχειν. ὅροι
 6 τοῦ ὑπάρχειν ζῶον—ἄνθρωπος—λευκόν, τοῦ μὴ
 ὑπάρχειν ἵππος—ἄνθρωπος—λευκόν, μέσον λευκόν.

XXI. Ἐὰν δὲ ἡ μὲν ὑπάρχειν ἡ δ' ἐνδέχεσθαι
 σημαίη τῶν προτάσεων, τὸ μὲν συμπέρασμα
 ἔσται ὅτι ἐνδέχεται καὶ οὐχ ὅτι ὑπάρχει, συλ-
 10 λογισμός δ' ἔσται τὸν αὐτὸν τρόπον ἐχόντων τῶν
 ὁρων ὃν καὶ ἐν τοῖς πρότερον. ἔστωσαν γὰρ
 πρῶτον κατηγορικοί, καὶ τὸ μὲν Α παντὶ τῷ Γ
 ὑπαρχέτω τὸ δὲ Β παντὶ ἐνδεχέσθω ὑπάρχειν.
 ἀντιστραφέντος οὖν τοῦ ΒΓ τὸ πρῶτον ἔσται
 σχῆμα, καὶ τὸ συμπέρασμα ὅτι ἐνδέχεται τὸ Α
 13 τινὶ τῶν Β ὑπάρχειν· ὅτε γὰρ ἡ ἑτέρα τῶν προ-

¹ τῷ] τὸ Cdfn.

the same arrangement of terms as in assertoric syllogisms.^a Let it be assumed that A may apply to all C, and B to some C. Then by the conversion of the particular premiss we shall again have the first figure ; for if A may apply to all C, and C to some B, then A may apply to some B. The same will be true if the universal statement relates to the premiss BC. Similarly also if the premiss AC is negative and BC affirmative ; for conversion will again give us the first figure.

If both premisses are assumed as negative, the one universal and the other particular, there will be no conclusion from the assumptions as they stand, but on their conversion we shall have a syllogism, as before.

When, however, both premisses are taken as indefinite or particular, there will be no syllogism ; for A necessarily applies both to none and to all of B.^b Examples of terms where the predicate applies to the subject are animal—man—white ; where it does not apply, horse—man—white. White is the middle term.

XXI. If one of the premisses has an assertoric and the other a problematic sense, the conclusion will be problematic, not assertoric, and a syllogism will result from the same arrangement of terms as in the previous examples.^c First let the terms be positive : let A apply to all C, and let B possibly apply to all C. Then the conversion of the premiss BC will give us the first figure, and the conclusion that A may apply to some B ; for we have seen ^a

B. One assertoric and one problematic premiss.
(1) Both premisses universal.

^b *i.e.* terms can be found (as in the examples which follow) to exhibit both these relations.

^c In ch. xx.

^a 33 b 25-40.

39 b

- τάσεων ἐν τῷ πρώτῳ σχήματι σημαῖνοι ἐνδέχ-
 σθαι, καὶ τὸ συμπέρασμα ἦν ἐνδεχόμενον. ὁμοίως
 δὲ καὶ εἰ τὸ μὲν ΒΓ ὑπάρχειν τὸ δὲ ΑΓ ἐνδέχε-
 σθαι, καὶ εἰ τὸ μὲν ΑΓ στερητικὸν τὸ δὲ ΒΓ
 κατηγορικόν, ὑπάρχοι δ' ὁποτερονοῦν, ἀμφοτέρως
 ἐνδεχόμενον ἔσται τὸ συμπέρασμα· γίνεταί γάρ
 30 πάλιν τὸ πρῶτον σχῆμα, δεδεικται δ' ὅτι τῆς
 ἐτέρας προτάσεως ἐνδέχασθαι σημαίνουσης ἐν
 αὐτῷ καὶ τὸ συμπέρασμα ἔσται ἐνδεχόμενον. εἰ
 δὲ τὸ [ἐνδεχόμενον] στερητικὸν τεθειῇ πρὸς τὸ
 ἔλαττον ἄκρον ἢ καὶ ἄμφω ληφθείη στερητικά,
 δι' αὐτῶν μὲν τῶν κειμένων οὐκ ἔσται συλλογισμός,
 35 ἀντιστραφέντων δ' ἔσται, καθάπερ ἐν τοῖς πρότερον.
 Εἰ δ' ἡ μὲν καθόλου τῶν προτάσεων ἡ δ' ἐν
 μέρει, κατηγορικῶν μὲν οὐσῶν ἀμφοτέρων ἢ τῆς
 μὲν καθόλου στερητικῆς τῆς δ' ἐν μέρει κατα-
 φατικῆς, ὁ αὐτὸς τρόπος ἔσται τῶν συλλογισμῶν·
 40 πάντες γὰρ περαίνονται διὰ τοῦ πρώτου σχήματος·
 ὥστε φανερόν ὅτι τοῦ ἐνδέχασθαι καὶ οὐ τοῦ
 ὑπάρχειν ἔσται ὁ συλλογισμός. εἰ δ' ἡ μὲν
 καταφατικὴ καθόλου ἢ δὲ στερητικὴ ἐν μέρει, διὰ
 τοῦ ἀδυνάτου ἔσται ἡ ἀπόδειξις. ὑπαρχέτω γὰρ
 45 τὸ μὲν Β παντὶ τῷ Γ, τὸ δὲ Α ἐνδεχέσθω τινὶ τῷ
 Γ μὴ ὑπάρχειν· ἀνάγκη δὴ τὸ Α ἐνδέχασθαι τινὶ
 τῷ Β μὴ ὑπάρχειν. εἰ γὰρ παντὶ τῷ Β τὸ Α
 ὑπάρχει ἐξ ἀνάγκης τὸ δὲ Β παντὶ τῷ Γ κεῖται
 ὑπάρχειν, τὸ Α παντὶ τῷ Γ ἐξ ἀνάγκης ὑπάρξει
 (τοῦτο γὰρ δεδεικται πρότερον)· ἀλλ' ὑπέκειτο τινὶ
 ἐνδέχασθαι μὴ ὑπάρχειν.
 50 Ὅταν δ' ἀδιόριστοι ἢ ἐν μέρει ληφθῶσιν ἀμ-
 φότεραι, οὐκ ἔσται συλλογισμός. ἀπόδειξις δ' ἡ

that when one of the premisses in the first figure has a problematic sense, the conclusion is also problematic. Similarly too if BC is assertoric and AC problematic; or if AC is negative and BC affirmative, and either is assertoric: in both cases the conclusion will be problematic, for again we get the first figure, and it has been shown that in it when one of the premisses is problematic in sense the conclusion will also be problematic. If, however, the negative problematic statement is attached to the minor term, or if both statements are taken as negative, no syllogism will result from the assumptions as they stand, but on their conversion there will be a syllogism, as before.

If one of the premisses is universal and the other particular, when both are affirmative, or when the universal is negative and the particular affirmative, the syllogisms will be effected in the same way; for all the conclusions are reached by means of the first figure. Hence it is evident that the conclusion will be problematic, not assertoric. If, however, the affirmative premiss is universal and the negative particular, the proof will be *per impossibile*. Let B apply to all C, and let A possibly not apply to some C. Then it necessarily follows that A may not apply to some B. For if A necessarily applies to all B, and B is still assumed to apply to all C, A will necessarily apply to all C; for this has been proved already.^a But it was assumed that it may not apply to some.

When both premisses are taken as indefinite or particular, there will be no syllogism. The proof

^a 30 a 15-23.

¹ om. n, comm., Waitz.

² ó om. AC Bekker.

40² αὐτὴ ἢ καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὄρων.

XXII. Εἰ δ' ἐστὶν ἡ μὲν ἀναγκαία τῶν προτάσεων ἢ δ' ἐνδεχομένη, κατηγορικῶν μὲν ὄντων τῶν ὄρων αἰεὶ τοῦ ἐνδέχεσθαι ἔσται συλλογισμός, ὅταν δ' ἢ τὸ μὲν κατηγορικὸν τὸ δὲ στερητικόν, εἴαν μὲν ἢ τὸ καταφατικὸν ἀναγκαῖον, τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν, εἴαν δὲ τὸ στερητικόν, καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν καὶ τοῦ μὴ ὑπάρχειν· τοῦ δ' ἐξ
10 ἀνάγκης μὴ ὑπάρχειν οὐκ ἔσται συλλογισμός, ὥσπερ οὐδ' ἐν τοῖς ἐτέροις σχήμασιν.

Ἔστωσαν δὴ κατηγοριοὶ πρῶτον οἱ ὅροι, καὶ τὸ μὲν Α παρὶ τῷ Γ ὑπαρχέτω ἐξ ἀνάγκης, τὸ δὲ Β [τῷ Γ]¹ παρὶ ἐνδεχέσθω ὑπάρχειν. ἐπεὶ οὖν τὸ μὲν Α παρὶ τῷ Γ ἀνάγκη, τὸ δὲ Γ τινὶ τῷ
15 Β ἐνδέχεται, καὶ τὸ Α τινὶ τῷ Β ἐνδεχόμενον ἔσται καὶ οὐχ ὑπάρχον· οὕτω γὰρ συνέπιπτεν ἐπὶ τοῦ πρώτου σχήματος. ὁμοίως δὲ δειχθήσεται καὶ εἰ τὸ μὲν ΒΓ τεθείη ἀναγκαῖον τὸ δὲ ΑΓ ἐνδεχόμενον.

Πάλιν ἔστω τὸ μὲν κατηγορικὸν τὸ δὲ στερητικόν, ἀναγκαῖον δὲ τὸ κατηγορικόν, καὶ τὸ μὲν
20 Α ἐνδεχέσθω μηδενὶ τῶν² Γ ὑπάρχειν τὸ δὲ Β παρὶ ὑπαρχέτω ἐξ ἀνάγκης. ἔσται δὴ πάλιν τὸ πρῶτον σχῆμα, καὶ [γὰρ]³ ἡ στερητικὴ πρότασις ἐνδέχεσθαι σημαίνει· φανερόν οὖν ὅτι τὸ συμπέρασμα ἔσται ἐνδεχόμενον· ὅτε γὰρ οὕτως ἔχοιεν αἱ προτάσεις ἐν τῷ πρώτῳ σχήματι, καὶ τὸ συμπέρασμα
25 ἦν ἐνδεχόμενον.

Εἰ δ' ἡ στερητικὴ πρότασις ἀναγκαία, τὸ συμ-

¹ τῷ Γ om. BCdfu: habent post παρὶ nm.

² τῶν] τῷ Cmu.

³ γὰρ seclusi.

is the same as in the case of universal syllogisms,^a and is obtained by means of the same terms.

XXII. If one of the premisses is apodeictic and the other problematic, when the terms are positive the conclusion will always be problematic; but when one is positive and the other negative, if the affirmative statement is apodeictic, the conclusion will be negative and problematic, but if the negative statement is apodeictic the conclusion will be negative problematic and negative assertoric^b; there will be no negative apodeictic conclusion, just as there was none in the other figures.

Thus let the terms first be positive, and let A necessarily apply to all C, and B possibly apply to all C. Then since A must apply to all C, and C may apply to some B, A will also apply, in a problematic and not in an assertoric sense, to some B; for we have seen^c that this is the consequence in the first figure. The proof will be similar also if the premiss BC be assumed as apodeictic and AC as problematic.

Next, let one statement be affirmative and the other negative, the affirmative being apodeictic; and let A possibly apply to no C, and B necessarily apply to all C. Then we shall again have the first figure; and the negative premiss has the problematic sense. Thus it is evident that the conclusion will be problematic; for we saw^d that when the premisses are in this relation in the first figure the conclusion is also problematic.

If, however, the negative premiss is apodeictic,

^a No such proof appears in the passage indicated (39 b 6-25), but the reference there (ll. 9-10) to the terms of the preceding chapter shows that Aristotle had in mind the section 39 b 2-6.

^b Cf. 40 a 30-32 *infra*.

^c 35 b 38—36 a 1.

^d 36 a 17-25.

C. One apodeictic and one problematic premiss.

(1) Both premisses universal.
(a) Both premisses affirmative.

(b) One affirmative and one negative premiss.

40 :

πέραςμα ἔσται καὶ ὅτι ἐνδέχεται τινὶ μὴ ὑπάρχειν καὶ ὅτι οὐχ ὑπάρχει. κείσθω γὰρ τὸ Α τῷ Γ μὴ ὑπάρχειν ἐξ ἀνάγκης, τὸ δὲ Β παντὶ ἐνδέχεσθαι. ἀντιστραφέντος οὖν τοῦ ΒΓ καταφατικῷ τὸ πρῶτον ἔσται σχῆμα, καὶ ἀναγκαῖα ἡ στερητικὴ πρότασις. ὅτε δ' οὕτως εἶχον αἱ προτάσεις, συνέβαινε τὸ Α τῷ Γ καὶ ἐνδέχεσθαι τινὶ μὴ ὑπάρχειν καὶ μὴ ὑπάρχειν, ὥστε καὶ τὸ Α τῷ Β ἀνάγκη τινὶ μὴ ὑπάρχειν. ὅταν δὲ τὸ στερητικὸν τεθῇ πρὸς τὸ ἔλαττον ἄκρον, εἴαν μὲν ἐνδεχόμενον, ἔσται συλλογισμὸς μεταληφθείσης τῆς προτάσεως, καθάπερ ἐν τοῖς πρότερον, εἴαν δ' ἀναγκαῖον, οὐκ ἔσται· καὶ γὰρ παντὶ ἀνάγκη καὶ οὐδενὶ ἐνδέχεται ὑπάρχειν. ὅροι τοῦ παντὶ ὑπάρχειν ὕπνος—ἵππος καθεύδων—ἄνθρωπος, τοῦ μηδενὶ ὕπνος—ἵππος ἐγρηγορῶς—ἄνθρωπος.

Ὁμοίως δὲ ἔξει καὶ εἰ ὁ μὲν καθόλου τῶν ὄρων ὁ δ' ἐν μέρει πρὸς τὸ μέσον· κατηγορικῶν μὲν γὰρ ὄντων ἀμφοτέρων τοῦ ἐνδέχεσθαι καὶ οὐ τοῦ ὑπάρχειν ἔσται συλλογισμὸς, καὶ ὅταν τὸ μὲν στερητικὸν ληφθῇ τὸ δὲ καταφατικόν, ἀναγκαῖον δὲ τὸ καταφατικόν. ὅταν δὲ τὸ στερητικὸν ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται τοῦ μὴ ὑπάρχειν· ὁ γὰρ αὐτὸς τρόπος ἔσται τῆςδείξεως καὶ καθόλου καὶ μὴ καθόλου τῶν ὄρων ὄντων· ἀνάγκη γὰρ διὰ τοῦ πρώτου σχήματος τελειοῦσθαι τοὺς συλλογισμούς, ὥστε καθάπερ ἐν ἐκείνοις, καὶ ἐπὶ τούτων ἀναγκαῖον συμπίπτειν. ὅταν δὲ τὸ στερητικὸν καθόλου ληφθῇ τεθῇ πρὸς τὸ ἔλαττον ἄκρον, εἴαν

* 36 a 33, where see note.

• Sc. in the present example.

there will be not merely a negative particular problematic but a negative particular assertoric conclusion. For let us assume that A necessarily does not apply to C, and that B may apply to all C. Then the conversion of the affirmative premiss BC will give the first figure, and the negative premiss is apodeictic. But we saw^a that when the premisses are in this relation it follows not merely that A may not apply but that A does not apply to some C; and so it must also follow^b that A does not apply to some B. When, however, the negative statement refers to the minor term, if it is problematic there will be a syllogism after substitution of the premiss,^c as before; but if the statement is apodeictic there will be no syllogism; for A both must apply to all B and must apply to none. Terms to illustrate the former relation are sleep—sleeping horse—man; to illustrate the latter, sleep—waking horse—man.

The same principle will also apply if one of the (2) One
(extreme) terms is in a universal and the other in a premiss
particular relation to the middle term. If both statements are affirmative the conclusion will be problematic and not assertoric; and also when one is taken as negative and the other as affirmative, the latter being apodeictic. When, however, the negative statement is apodeictic, the conclusion will be negative and assertoric; for the proof will take the same form whether the terms are universal or not, because the syllogisms must be completed by means of the first figure, and so the result must be the same in these as in the former examples.^d When, however, the negative statement, taken as universal, refers to the

^a *i.e.* the corresponding affirmative premiss.

^d *Cf.* 40 a 25.

60 b

10 μὲν ἐνδεχόμενον, ἔσται συλλογισμὸς διὰ τῆς ἀντιστροφῆς, εἰ δ' ἀναγκαῖον, οὐκ ἔσται. δειχθήσεται δὲ τὸν αὐτὸν τρόπον ὃν καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὁρων.

Φανερόν οὖν καὶ ἐν τούτῳ τῷ σχήματι πότε καὶ πῶς ἔσται συλλογισμὸς, καὶ πότε τοῦ ἐνδέχεσθαι
15 καὶ πότε τοῦ ὑπάρχειν. δῆλον δὲ καὶ ὅτι πάντες ἀτελεῖς, καὶ ὅτι τελειοῦνται διὰ τοῦ πρώτου σχήματος.

XXIII. Ὅτι μὲν οὖν οἱ ἐν τούτοις τοῖς σχήμασι συλλογισμοὶ τελειοῦνται διὰ τῶν ἐν τῷ πρώτῳ σχήματι καθόλου συλλογισμῶν καὶ εἰς τούτους
20 ἀνάγονται, δῆλον ἐκ τῶν εἰρημένων· ὅτι δ' ἀπλῶς πᾶς συλλογισμὸς οὕτως ἔξει, νῦν ἔσται φανερόν, ὅταν δειχθῇ πᾶς γιγνόμενος διὰ τούτων τινὸς τῶν σχημάτων.

Ἀνάγκη δὴ πᾶσαν ἀπόδειξιν καὶ πάντα συλλογισμὸν ἢ ὑπάρχον τι ἢ μὴ ὑπάρχον δεικνύναι, καὶ
25 τοῦτο ἢ καθόλου ἢ κατὰ μέρος, ἔτι ἢ δεικτικῶς ἢ ἐξ ὑποθέσεως· τοῦ δ' ἐξ ὑποθέσεως μέρος τὸ διὰ τοῦ ἀδυνάτου. πρῶτον οὖν εἵπωμεν περὶ τῶν δεικτικῶν· τούτων γὰρ δειχθέντων φανερόν ἔσται καὶ ἐπὶ τῶν εἰς τὸ ἀδύνατον καὶ ὅλως τῶν ἐξ ὑποθέσεως.

30 Εἰ δὴ δέοι τὸ Α κατὰ τοῦ Β συλλογίσασθαι ἢ ὑπάρχον ἢ μὴ ὑπάρχον, ἀνάγκη λαβεῖν τι κατὰ τινος· εἰ μὲν οὖν τὸ Α κατὰ τοῦ Β ληφθείη, τὸ ἐξ ἀρχῆς ἔσται εἰλημμένον· εἰ δὲ κατὰ τοῦ Γ, τὸ δὲ

minor term, if it is problematic, there will be a syllogism by conversion ; but if it is apodeictic, there will be no syllogism. The proof will be effected in the same way as in the universal syllogisms, and by means of the same terms.

Thus it is evident, in this figure also, when and in what circumstances there will be a syllogism, and when this will be problematic and when assertoric. It is also clear that the syllogisms are all imperfect, and that they are completed by means of the first figure.

XXIII. It is evident, then, from the foregoing analysis that the syllogisms in this figure are completed by means of the universal syllogisms in the first figure, and are reducible to them. This holds good of every syllogism without exception, as will at once be evident when it has been shown that every syllogism is effected by means of one of these figures.

All syllogisms are effected by the three figures.

Now every demonstration and every syllogism must prove that some attribute does or does not apply to some subject, and that either universally or in a particular sense. Further, the proof must be either ostensive or hypothetical. One kind of hypothetical proof is proof *per impossibile*. First, then, let us deal with ostensive proofs ; for when we have shown the conditions which govern these, the facts will also be made clear with regard to proofs by reduction *ad impossibile* and to hypothetical proofs in general.

Ostensive and hypothetical proofs.

Supposing, then, that it is required to draw an inference that the predicate A applies or does not apply to the subject B, we must assume some predication of some subject. Now if we assume that A is predicated of B, we shall have a *petitio principii*. If we assume that A is predicated of C, but C is predi-

Ostensive proof requires two premisses.

40 b

Γ κατὰ μηδενός, μηδ' ἄλλο κατ' ἐκείνου, μηδὲ
 25 κατὰ τοῦ Α ἕτερον, οὐδεὶς ἔσται συλλογισμός· τῷ
 γὰρ ἐν καθ' ἐνὸς ληφθῆναι οὐδὲν συμβαίνει ἐξ
 ἀνάγκης· ὥστε προσληπτέον καὶ ἑτέραν πρότασιν.

Ἐὰν μὲν οὖν ληφθῇ τὸ Α κατ' ἄλλου ἢ ἄλλο
 κατὰ τοῦ Α, ἢ κατὰ τοῦ Γ ἕτερον, εἶναι μὲν συλ-
 λογισμὸν οὐδὲν κωλύει, πρὸς μέντοι τὸ Β οὐκ
 40 ἔσται διὰ τῶν εἰλημμένων. οἷδ' ὅταν τὸ Γ ἐτέρῳ,
 41 α κακέϊνο ἄλλῳ, καὶ τοῦτο ἐτέρῳ, μὴ συνάπτῃ δέ
 πρὸς τὸ Β, οὐδ' οὕτως ἔσται πρὸς τὸ Β συλλογι-
 σμός.¹ ὅλως γὰρ εἶπομεν ὅτι οἷδεὶς οὐδέποτε
 ἔσται συλλογισμὸς ἄλλου κατ' ἄλλου μὴ ληφθέντος
 τινὸς μέσου, ὃ πρὸς ἑκάτερον ἔχει πως ταῖς κατ-
 5 ηγορίαις· ὁ μὲν γὰρ συλλογισμὸς ἀπλῶς ἐκ προ-
 τάσεών ἐστιν, ὁ δὲ πρὸς τόδε συλλογισμὸς ἐκ τῶν
 πρὸς τόδε προτάσεων, ὁ δὲ τοῦδε πρὸς τόδε διὰ τῶν
 τοῦδε πρὸς τόδε προτάσεων. ἀδύνατον δὲ πρὸς
 τὸ Β λαβεῖν πρότασιν μηδὲν μήτε κατηγοροῦντας
 αὐτοῦ μήτ' ἀπαρνουμένους, ἢ πάλιν τοῦ Α πρὸς τὸ
 10 Β μηδὲν κοινὸν λαμβάνοντας ἀλλ' ἑκατέρου ἰδια
 ἅττα κατηγοροῦντας ἢ ἀπαρνουμένους· ὥστε ληπ-
 τέον τι μέσον ἀμφοῖν, ὃ συνάψει τὰς κατηγορίας,
 εἵπερ ἔσται τοῦδε πρὸς τόδε συλλογισμός.

¹ συλλογισμός] συλλογισμός τοῦ Α Βfu.

cated of nothing, and no other term is predicated of C, and nothing else is predicated of A, there will be no syllogism; for no necessary conclusion follows from the assumption that one term is predicated of one other term. Hence we must also assume another premiss.

Now if we assume that A is predicated of another term, or another term of A, or some other term of C, there is nothing to prevent a syllogism; but if it proceeds from these assumptions it will have no reference to B. Again, when C is connected to another term, and this to another, and this to yet another, and the series is not connected with B, in this case too we shall have no syllogism with reference to B. For we have stated ^a the general principle that we shall never have any syllogism proving that one term is predicated of another unless some middle term is assumed which is related in some way by predication to each of the other two; for the syllogism in general proceeds from premisses, and the syllogism relating to a given term proceeds from premisses relating to that term, and the syllogism proving the relation of one term to another is obtained by means of premisses which state the relation of one to the other. But it is impossible to obtain a premiss relating to B if we neither assert nor deny anything of B; or again one which states the relation of A to B if we cannot find something common to both, but merely assert or deny certain attributes peculiar to each. Therefore we must take some middle term relating to both, which will link the predications together, if there is to be a syllogism proving the relation of one term to the other.

Need for a middle term.

^a 25 b 32.

41 a

Εἰ οὖν ἀνάγκη μὲν τι λαβεῖν πρὸς ἄμφω κοινόν, τοῦτο δ' ἐνδέχεται τριχῶς (ἢ γὰρ τὸ Α τοῦ Γ καὶ
 15 τὸ Γ τοῦ Β κατηγορήσαντας, ἢ τὸ Γ κατ' ἄμφοιν, ἢ ἄμφω κατὰ τοῦ Γ), ταῦτα δ' ἐστὶ τὰ εἰρημένα σχήματα, φανερόν ὅτι πάντα συλλογισμὸν ἀνάγκη γίνεσθαι διὰ τούτων τινὸς τῶν σχημάτων. ὁ γὰρ αὐτὸς λόγος καὶ εἰ διὰ πλειόνων συνάπτοι πρὸς
 20 τὸ Β· ταὐτὸ γὰρ ἔσται σχῆμα καὶ ἐπὶ τῶν πολλῶν.

Ὅτι μὲν οὖν οἱ δεικτικοὶ πάντες περαίνονται διὰ τῶν προειρημένων σχημάτων, φανερόν· ὅτι δὲ καὶ οἱ εἰς τὸ ἀδύνατον, δῆλον ἔσται διὰ τούτων. πάντες γὰρ οἱ διὰ τοῦ ἀδυνάτου περαίνοντες τὸ μὲν ψεῦδος
 25 συλλογίζονται, τὸ δ' ἐξ ἀρχῆς ἐξ ὑποθέσεως δεικνύουσιν, ὅταν ἀδυνάτον τι συμβαίῃ τῆς ἀντιφάσεως τεθείσης, ὡς ὅτι ἀσύμμετρος ἢ διάμετρος διὰ τὸ γίνεσθαι τὰ περιττὰ ἴσα τοῖς ἀρτίοις συμμέτρου τεθείσης. τὸ μὲν οὖν ἴσα γίνεσθαι τὰ περιττὰ τοῖς ἀρτίοις συλλογίζονται, τὸ δ' ἀσύμμετρον εἶναι τὴν διάμετρον ἐξ ὑποθέσεως δεικνύ-
 30 ουσιν, ἐπεὶ ψεῦδος συμβαίνει διὰ τὴν ἀντίφασιν. τοῦτο γὰρ ἦν τὸ διὰ τοῦ ἀδυνάτου συλλογίσασθαι, τὸ δεῖξαι τι ἀδύνατον διὰ τὴν ἐξ ἀρχῆς ὑπόθεσιν. ὥστ' ἐπεὶ τοῦ ψεύδους γίγνεται συλλογισμὸς δεικτικὸς ἐν τοῖς εἰς τὸ ἀδύνατον ἀπαγομένοις, τὸ
 35 δ' ἐξ ἀρχῆς ἐξ ὑποθέσεως δείκνυται, τοὺς δὲ δεικτικούς πρότερον εἵπομεν ὅτι διὰ τούτων περαίνονται τῶν σχημάτων, φανερόν ὅτι καὶ οἱ διὰ τοῦ

* For the proof see Euclid, *Elements*, x. app. 27 (Heiberg and Menge).

Since, then, we must take some common term which is related to both, and this may be done in three ways, viz., by predicating A of C and C of B, or C of both, or both of C, and these are the figures already described, it is evident that every syllogism must be effected by means of one of these figures ; for the same principle will also hold good if A is connected with B by more than one term ; the figure will be the same also in the case of several terms.

The different combinations of the three terms give the three figures.

It is evident, then, that ostensive proofs are carried out by means of the figures already described. That proofs by reduction *ad impossibile* are also carried out by their means will be clearly shown by what follows. Everyone who carries out a proof *per impossibile* proves the false conclusion by syllogism and demonstrates the point at issue *ex hypothesi* when an impossible conclusion follows from the assumption of the contradictory proposition. *E.g.*, one proves that the diagonal of a square is incommensurable with the sides by showing that if it is assumed to be commensurable, odd become equal to even numbers.^a Thus he argues to the conclusion that odd becomes equal to even, and proves *ex hypothesi* that the diagonal is incommensurable, since the contradictory proposition produces a false result. For we saw that to reach a logical conclusion *per impossibile* is to prove some conclusion impossible on account of the original assumption.^b Therefore since in reduction *ad impossibile* we obtain an ostensive syllogism of falsity (the point at issue being proved *ex hypothesi*), and we have stated above that ostensive syllogisms are effected by means of these figures, it is evident that *per impossi-*

Procedure of hypothetical proof.

^b *i.e.* to show that the contradictory of the required conclusion is incompatible with one of the original premisses.

41 a ἀδυνάτου συλλογισμοὶ διὰ τούτων ἔσονται τῶν
 σχημάτων. ὡσαύτως δὲ καὶ οἱ ἄλλοι πάντες οἱ ἐξ
 ὑποθέσεως· ἐν ᾧ αὖσι γὰρ ὁ μὲν συλλογισμὸς γί-
 40 νεται πρὸς τὸ μεταλαμβάνομενον, τὸ δ' ἐξ ἀρχῆς
 41 b περαίνεται δι' ὁμολογίας ἢ τινος ἄλλης ὑποθέσεως.
 εἰ δὲ τοῦτ' ἀληθές, πᾶσαν ἀπόδειξιν καὶ πάντα
 συλλογισμὸν ἀνάγκη γίνεσθαι διὰ τριῶν τῶν
 προειρημένων σχημάτων. τούτου δὲ δειχθέντος
 δηλὸν ὡς ἅπας τε συλλογισμὸς ἐπιτελεῖται διὰ τοῦ
 42 πρώτου σχήματος καὶ ἀνάγεται εἰς τοὺς ἐν τούτῳ
 καθόλου συλλογισμούς.

XXIV. Ἐτι τε ἐν ᾧ παντὶ δεῖ κατηγορικόν τινα
 τῶν ὄρων εἶναι καὶ τὸ καθόλου ὑπάρχειν· ἄνευ γὰρ
 τοῦ καθόλου ἢ οὐκ ἔσται συλλογισμὸς ἢ οὐ πρὸς τὸ
 κείμενον, ἢ τὸ ἐξ ἀρχῆς αἰτήσεται. κείσθω γὰρ
 10 τὴν μουσικὴν ἡδονὴν εἶναι σπουδαίαν. εἰ μὲν οὖν
 ἀξιῶσειεν ἡδονὴν εἶναι σπουδαίαν, μὴ προσθεῖς τὸ
 πᾶσαν, οὐκ ἔσται συλλογισμὸς· εἰ δὲ τινὰ ἡδονήν,
 εἰ μὲν ἄλλην, οὐδὲν πρὸς τὸ κείμενον, εἰ δ' αὐτὴν
 ταύτην, τὸ ἐξ ἀρχῆς λαμβάνει.

Μᾶλλον δὲ γίνεταί φανερόν ἐν τοῖς διαγράμμασιν,
 15 ὅλον ὅτι τοῦ ἰσοσκελοῦς ἴσαι αἱ πρὸς τῇ βάσει.
 ἔστωσαν εἰς τὸ κέντρον ἡγμέναι αἱ AB. εἰ οὖν

bile syllogisms will also be obtained by means of these figures. The same is true of all other hypothetical proofs ; for in every case the syllogism is effected with reference to the substituted proposition, and the required conclusion is reached by means of a concession^a or some other hypothesis. But if this is true, every demonstration and every syllogism will be effected by means of the three figures already described ; and this being proved, it is obvious that every syllogism is completed by means of the first figure, and is reducible to the universal syllogisms in this figure.

All inferential processes are reducible to the syllogisms of the first figure.

XXIV. Further, in every syllogism one of the terms must be positive,^b and universality must be involved. Without universality either there will be no syllogism, or the conclusion will be unrelated to the assumption, or there will be *petitio principii*. Suppose that we have to prove that musical enjoyment is commendable. Then if we postulate that enjoyment is commendable, unless 'all' is prefixed to 'enjoyment,' there will be no syllogism. If we postulate that some enjoyment is commendable, then if it is a different enjoyment, there is no reference to the original assumption ; and if it is the same, there is a *petitio principii*.

In every syllogism (1) at least one premiss must be affirmative ; (2) at least one premiss must be universal.

The point can be seen more clearly in the case of geometrical theorems. *E.g.*, take the proposition that the angles adjacent to the base of an isosceles triangle are equal. Let the lines A and B be drawn

Example from Geometry.

^a The process referred to belongs rather to dialectic reasoning. One's opponent is induced to concede that the proposition to be proved is true if some other proposition is true ; the latter is then proved syllogistically.

^b *i.e.* one of the premisses must be affirmative.

41 b

ἴσην λαμβάνοι τὴν ΑΓ γωνίαν τῇ ΒΔ μὴ ὅλως
ἀξιώσας ἴσας τὰς τῶν ἡμικυκλίων, καὶ πάλιν τὴν
Γ τῇ Δ μὴ πᾶσαν προσλαβὼν τὴν τοῦ τμήματος,
ἔτι' ἀπ' ἴσων οὐσῶν τῶν ὅλων γωνιῶν καὶ ἴσων
20 ἀφηρημένων ἴσας εἶναι τὰς λοιπὰς τὰς ΕΖ,¹ τὸ ἐξ
ἀρχῆς αἰτήσεται, εἰ μὴ λάβῃ ἀπὸ τῶν ἴσων ἴσων
ἀφαιρουμένων ἴσα λείπεσθαι.

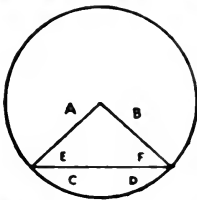
Φανερόν οὖν ὅτι ἐν ᾧπαντι δεῖ τὸ καθόλου ὑπάρ-
χειν, καὶ ὅτι τὸ μὲν καθόλου ἐξ ἀπάντων τῶν ὄρων
καθόλου δείκνυται, τὸ δ' ἐν μέρει καὶ οὕτως κα-
25 κείνως, ὥστ' εἰ μὲν ἡ τὸ συμπέρασμα καθόλου,
καὶ τοὺς ὄρους ἀνάγκη καθόλου εἶναι, εἰ δ' οἱ ὄροι
καθόλου, ἐνδέχεται τὸ συμπέρασμα μὴ εἶναι καθ-
όλου. δῆλον δὲ καὶ ὅτι ἐν ᾧπαντι συλλογισμῷ ἡ
ἀμφοτέρας ἡ τὴν ἑτέραν πρότασιν ὁμοίαν ἀνάγκη
γίγνεσθαι τῷ συμπεράσματι. λέγω δ' οὐ μόνον
30 τῷ καταφατικῇν εἶναι ἡ στερητικῇν, ἀλλὰ καὶ τῷ
ἀναγκαίαν ἡ ὑπάρχουσαν ἡ ἐνδεχομένην. ἐπι-
σκέψασθαι δὲ δεῖ καὶ τὰς ἄλλας κατηγορίας.

Φανερόν δὲ καὶ ἀπλῶς πότ' ἔσται καὶ πότ' οὐκ

¹ ἐτι δ' C.

² τὰς ΕΖ] τὰς πρὸς τοῖς ΕΖ n: τὰς ἐξ d¹: secl. Waitz.

* Aristotle seems to imply the figure given here. A and B are radii of a circle; the chord which joins them forms the base, as they form the equal sides, of an isosceles triangle. E and F are the angles (between the radii and the chord) at the base of this triangle. AC and BD are the angles formed by A and B with the circumference (not with the base, as in the Oxford translation), or rather with the tangents to the circumference; similarly C and D are the angles formed by the chord with the circumference. This



to the centre.^a Then if you assume that $\angle AC = \angle BD$ without postulating generally that the angles of semi-circles are equal, and again if you assume that $\angle C = \angle D$ without also assuming that all angles of the same segment are equal, and further if you assume that when equal angles are subtracted from the whole angles the remaining angles E and F are equal, unless you assume (the general principle) that when equals are subtracted from equals the remainders are equal, you will be guilty of *petitio principii*.

Thus it is evident that in every syllogism universality must be involved, and that a universal conclusion can only be proved when all the terms are universal, whereas a particular conclusion can be proved whether the terms are or are not all universal; so that if the conclusion is universal, the terms must also be universal, but if the terms are universal the conclusion may not be universal. It is clear also that in every syllogism one or both of the premisses must be similar to the conclusion; I do not mean merely in being affirmative or negative, but in being apodeictic or assertoric or problematic.^b We must also take into account the other forms of predication.^c

(3) At least one premiss must be of the same mode as the conclusion.

It is, however, evident both generally when there interpretation of the phrase 'angles of semicircles' or 'of the same segment' is given by all the commentators and is supported by Euclid III. 16. 31. Waitz's interpretation, involving the excision of τὰς EZ in l. 20, is less satisfactory.

^b This is inconsistent with the view, stated in 38 a 15-25, that an assertoric conclusion may be drawn from one apodeictic and one problematic premiss.

^c i.e. any other form of predication which appears in the conclusion must also appear in at least one premiss.

41 b

ἔσται συλλογισμός, καὶ πότε δυνατός καὶ πότε τέλειος, καὶ ὅτι συλλογισμοῦ ὄντος ἀναγκαῖον ἔχειν
 25 τοὺς ὄρους κατὰ τινα τῶν εἰρημένων τρόπων.

XXV. Δήλον δὲ καὶ ὅτι πᾶσα ἀπόδειξις ἔσται διὰ τριῶν ὄρων καὶ οὐ πλειόνων, εἰ μὴ δι' ἄλλων καὶ ἄλλων τὸ αὐτὸ συμπέρασμα γίγνηται, οἷον τὸ Ε διὰ τε τῶν ΑΒ καὶ διὰ τῶν ΓΔ, ἢ διὰ τῶν ΑΒ καὶ
 40 ΑΓ¹ καὶ ΒΓ (πλείω γὰρ μέσα τῶν αὐτῶν οὐδὲν
 42 α εἶναι κωλύει), τούτων δ' ὄντων οὐχ εἰς ἀλλὰ πλείους εἰσὶν οἱ συλλογισμοί· ἢ πάλιν ὅταν ἐκάτερον τῶν ΑΒ διὰ συλλογισμοῦ ληφθῇ (οἷον τὸ Α διὰ τῶν ΔΕ καὶ πάλιν τὸ Β διὰ τῶν ΖΘ), ἢ τὸ μὲν ἐπαγωγῇ, τὸ δὲ συλλογισμῷ. ἀλλὰ καὶ οὕτως πλείους οἱ
 5 συλλογισμοί· πλείω γὰρ τὰ συμπεράσματα ἔστιν, οἷον τό τε Α καὶ τὸ Β καὶ τὸ Γ. εἰ δ' οὖν μὴ πλείους ἀλλ' εἰς, οὕτω μὲν ἐνδέχεται γενέσθαι διὰ πλειόνων τὸ αὐτὸ συμπέρασμα, ὥς δὲ τὸ Γ διὰ τῶν ΑΒ ἀδύνατον. ἔστω γὰρ τὸ Ε συμπεπερασμένον ἐκ τῶν ΑΒΓΔ. οὐκοῦν ἀνάγκη τι αὐτῶν
 10 ἄλλο πρὸς ἄλλο εἰληφθαι, τὸ μὲν ὡς ὅλον τὸ δ' ὡς μέρος· τοῦτο γὰρ δέδεικται πρότερον, ὅτι οἷτος συλλογισμοῦ ἀναγκαῖον οὕτως τινὰς ἔχειν τῶν ὄρων. ἐχέτω οὖν τὸ Α οὕτως πρὸς τὸ Β. ἔστιν ἄρα τι ἐξ αὐτῶν συμπερασμα. οὐκοῦν ἤτοι τὸ Ε ἢ τῶν ΓΔ θάτερον ἢ ἄλλο τι παρὰ ταῦτα. καὶ εἰ
 15 μὲν τὸ Ε, ἐκ τῶν ΑΒ μόνον ἂν εἴη ὁ συλλογισμός.

¹ καὶ ΑΓ supra lineam add. Bu: om. A.

^a Cf. 28 a 16, note.

^b i.e. as an immediate conclusion from two simple premisses.

^c 40 b 30.

will and when there will not be a syllogism, and when the syllogism will be valid^a and when perfect; and that if there is a syllogism the terms must be related in one of the ways already described.

XXV. It is clear also that every demonstration will be effected by means of three terms and no more—unless the same conclusion is reached by means of different combinations of terms; *e.g.*, if E is concluded both from the propositions A and B and from the propositions C and D, or from A and B, A and C, and B and C (for there is no reason why there should not be more than one middle between the same terms), but in this case there is not one syllogism but several; or again when each of the propositions A and B is obtained by syllogism (*e.g.*, A by means of D and E, and B by means of F and G), or one by induction and the other by syllogism; but here again there will be several syllogisms, since there are several conclusions, viz., A, B and C. If it be granted that these are not several syllogisms but only one, then the same conclusion can be reached by more than three terms in this way; but it cannot be reached as C is by means of A and B.^b For let E be the conclusion reached by means of the premisses A, B, C and D. Then some one of these must have been assumed to be related to some other as whole to part; for it has already been shown^c that where there is a syllogism certain of the terms must be so related.^d Let A, then, be so related to B. Then there is some conclusion from these premisses; either (1) E, or (2) one of the propositions C and D, or something else apart from these. (1) If it is E, the syllogism could be

Three terms only are required for demonstration.

^a *Sc.* and therefore the premisses must exhibit a similar relation.

42 a

τὰ δὲ ΓΔ εἰ μὲν ἔχει οὕτως ὥστ' εἶναι τὸ μὲν ὡς ὅλον τὸ δ' ὡς μέρος, ἔσται τι καὶ ἐξ ἐκείνων, καὶ ἦτοι τὸ Ε ἢ τῶν ΑΒ θάτερον ἢ ἄλλο τι παρὰ
 20 ταῦτα. καὶ εἰ μὲν τὸ Ε ἢ τῶν ΑΒ θάτερον, ἢ πλείους ἔσονται οἱ συλλογισμοί, ἢ ὡς ἐνεδέχeto ταὐτὸ διὰ πλειόνων ὁρων περαίνεσθαι συμβαίνει· εἰ δ' ἄλλο τι παρὰ ταῦτα, πλείους ἔσονται καὶ ἀσύν-
 απτοι οἱ συλλογισμοὶ πρὸς ἀλλήλους. εἰ δὲ μὴ οὕτως ἔχοι τὸ Γ πρὸς τὸ Δ ὥστε ποιεῖν συλ-
 λογισμόν, μάτην ἔσται εἰλημμένα, εἰ μὴ ἐπαγωγῆς ἢ κρίψεως ἢ τινος ἄλλου τῶν τοιούτων χάριν.

25 Εἰ δ' ἐκ τῶν ΑΒ μὴ τὸ Ε ἀλλ' ἄλλο τι γίνεταί συμπέρασμα, ἐκ δὲ τῶν ΓΔ ἢ τούτων θάτερον ἢ ἄλλο παρὰ ταῦτα, πλείους τε οἱ συλλογισμοὶ γίνον-
 ται καὶ οὐ τοῦ ὑποκειμένου· ὑπέκειτο γὰρ εἶναι τοῦ Ε τὸν συλλογισμόν. εἰ δὲ μὴ γίνεταί ἐκ τῶν ΓΔ μηδὲν συμπέρασμα, μάτην τε εἰληφθαι αὐτὰ συμ-
 30 βαίνει καὶ μὴ τοῦ ἐξ ἀρχῆς εἶναι τὸν συλλογισμόν· ὥστε φανερόν ὅτι πᾶσα ἀπόδειξις καὶ πᾶς συλ-
 λογισμὸς ἔσται διὰ τριῶν ὁρων μόνον.

Τούτου δ' ὄντος φανεροῦ, δῆλον ὡς καὶ ἐκ δύο προτάσεων καὶ οὐ πλειόνων (οἱ γὰρ τρεῖς ὅροι δύο προτάσεις), εἰ μὴ προσλαμβάνοιτο, καθάπερ ἐν τοῖς
 35 ἐξ ἀρχῆς ἐλέχθη, πρὸς τὴν τελείωσιν τῶν συλ-
 λογισμῶν. φανερόν οὖν ὡς ἐν ᾧ λόγῳ συλλογι-

• 42 a 6.

• i.e. by conversion ; 24 b 23.

drawn from A and B alone. And (i.) if C and D are in the relation of whole to part, there will be some conclusion from these too ; either (a) E or one of the propositions A and B or (b) something else apart from these. (a) If it is E or one of the propositions A and B, either there will be more than one syllogism, or it follows that the same conclusion is reached by several terms in the way which we saw^a to be possible. (b) If, however, the conclusion is something else apart from these, there will be several syllogisms which are unconnected with one another. (ii.) If, on the other hand, C is not related to D in such a way as to produce a conclusion, they will have been assumed to no purpose, unless with a view to induction or obscuring the argument or some other such object.

Again, (2) if the conclusion drawn from A and B is not E but something else, and (i.) the conclusion from C and D is either one of the propositions A and B or something else apart from them, more than one syllogism results, and these syllogisms do not prove the required conclusion ; for it was assumed that the syllogism proved E. And (ii.) if no conclusion follows from C and D, it follows that these propositions were assumed to no purpose, and that the syllogism does not prove the original assumption. Hence it is evident that every demonstration and every syllogism will be effected by means of three terms only.

This being evident, it is clear also that every syllogism proceeds from two premisses and no more (for the three terms form two premisses)—unless some further assumption be made, as we said at the beginning, in order to complete the syllogisms.^b Thus it is evident that if in any syllogistic argument

Every syllogism proceeds from two premisses only.

42 a

στικῶ μὴ ἄρτιαί εἰσιν αἱ προτάσεις δι' ὧν γίνεται
τὸ συμπέρασμα τὸ κύριον (ἓνα γὰρ τῶν ἄνωθεν
συμπερασμάτων ἀναγκαῖον εἶναι προτάσεις), οὗτος
ὁ λόγος ἢ οὐ συλλελογίσται ἢ πλείω τῶν ἀναγκαίων
10 ἠρώτηκε πρὸς τὴν θέσιν.

42 b

Κατὰ μὲν οὖν τὰς κυρίας προτάσεις λαμβανο-
μένων τῶν συλλογισμῶν, ἅπας ἔσται συλλογισμὸς
ἐκ προτάσεων μὲν ἀρτίων ἐξ ὄρων δὲ περιττῶν· ἐνὶ
γὰρ πλείους οἱ ὅροι τῶν προτάσεων. ἔσται δὲ καὶ
5 τὰ συμπεράσματα ἡμίση τῶν προτάσεων. ὅταν δὲ
διὰ προσυλλογισμῶν περαινῇται ἢ διὰ πλειόνων
μέσων 'μὴ' συνεχῶν (οἶον τὸ ΑΒ διὰ τῶν ΓΔ), τὸ
μὲν πλῆθος τῶν ὄρων ὡσαύτως ἐνὶ ὑπερέξει τὰς
προτάσεις (ἢ γὰρ ἐξωθεν ἢ εἰς τὸ μέσον τεθήσεται
ὁ παρεμπίπτων ὅρος, ἀμφοτέρως δὲ συμβαίνει ἐνὶ
10 ἐλάττω εἶναι τὰ διαστήματα τῶν ὄρων, αἱ δὲ
προτάσεις ἴσαι τοῖς διαστήμασιν), οὐ μέντοι αἰεὶ αἱ
μὲν ἄρτιαι ἔσονται οἱ δὲ περιττοί, ἀλλ' ἐναλλάξ,
ὅταν μὲν αἱ προτάσεις ἄρτιαι, περιττοὶ οἱ ὅροι, ὅταν
δ' οἱ ὅροι ἄρτιοι, περιτταὶ αἱ προτάσεις (ἅμα γὰρ
τῷ ὄρῳ μία προστίθεται πρότασις, ἂν ὀποθενοῦν
15 προστεθῇ ὁ ὅρος), ὥστ' ἐπεὶ αἱ μὲν ἄρτιαι οἱ δὲ
περιττοὶ ἦσαν, ἀνάγκη παραλλάττειν τῆς αὐτῆς
προσθέσεως γιγνομένης. τὰ δὲ συμπεράσματα
οὐκέτι τὴν αὐτὴν ἔξει τάξιν οὔτε πρὸς τοὺς ὅρους
οὔτε πρὸς τὰς προτάσεις· ἐνὸς γὰρ ὅρου προστιθε-
μένου συμπεράσματα προστεθήσεται ἐνὶ ἐλάττω
20 τῶν προϋπαρχόντων ὄρων· πρὸς μόνον γὰρ τὸν

¹ μὴ om. n, secl. Waitz.

* As in sorites.

† Sc. in the simple syllogism.

the premisses by which the conclusion proper is reached (I say 'proper' because some of the earlier conclusions must necessarily be premisses) are not even in number, then this argument either has not been proved syllogistically or has postulated more premisses than are necessary for proving the hypothesis.

Thus if syllogisms are considered with respect to their premisses properly so called, every syllogism will consist of an even number of premisses and an odd number of terms; for the terms are one more than the premisses. Moreover, the conclusions will be half as many as the premisses. But when the conclusion is reached by means of prosyllogisms or of several consecutive middle terms^a (e.g., the conclusion AB by means of the terms C and D), the number of the terms will exceed that of the premisses, as before, by one (for each further term which is introduced will be added either externally or intermediately to the sequence, and in either case it follows that the intervals are one fewer than the terms, and there are as many premisses as intervals); the former will not, however, always be even and the latter odd, but alternately when the premisses are even the terms will be odd, and when the terms are even the premisses will be odd; for wherever a term is added one premiss is added as well. Thus since the premisses were^b even and the terms odd, their numbers must change accordingly when the same addition is made to both. But the conclusions will no longer preserve the same numerical relation either to the terms or to the premisses; for the addition of one term will increase the number of conclusions by one less than the original number of terms, since it will form con-

Prosyllogisms and sorites.

42 b

ἔσχατον οὐ ποιεῖ συμπέρασμα, πρὸς δὲ τοὺς ἄλλους πάντας, ὅσον εἰ τῷ ΑΒΓ' πρόσκειται τὸ Δ, εὐθύς καὶ συμπεράσματα δύο πρόσκειται, τό τε πρὸς τὸ Α καὶ τὸ πρὸς τὸ Β. ὁμοίως δὲ καὶ πὶ τῶν ἄλλων. καὶ εἰς τὸ μέσον δὲ παρεμπίπτῃ, τὸν αὐτὸν τρόπον·
 25 πρὸς ἓνα γὰρ μόνον οὐ ποιήσῃ συλλογισμόν. ὥστε πολὺ πλείω τὰ συμπεράσματα καὶ τῶν ὁρῶν ἔσται καὶ τῶν προτάσεων.

XXVI. Ἐπεὶ δ' ἔχομεν περὶ ὧν οἱ συλλογισμοί, καὶ ποῖον ἐν ἐκάστῳ σχήματι καὶ ποσαχῶς δέικνυται, φανερόν ἡμῖν ἐστὶ καὶ ποῖον πρόβλημα
 30 χαλεπὸν καὶ ποῖον εὐεπιχείρητον· τὸ μὲν γὰρ ἐν πλείοσι σχήμασι καὶ διὰ πλειόνων πτώσεων περαινόμενον ῥᾶον, τὸ δ' ἐν ἐλάττοσι καὶ δι' ἐλαττόνων δυσεπιχειρητότερον.

Τὸ μὲν οὖν καταφατικὸν τὸ καθόλου διὰ τοῦ πρώτου σχήματος δέικνυται μόνου, καὶ διὰ τούτου μοναχῶς· τὸ δὲ στερητικὸν διὰ τε τοῦ πρώτου καὶ
 35 διὰ τοῦ μέσου, καὶ διὰ μὲν τοῦ πρώτου μοναχῶς, διὰ δὲ τοῦ μέσου διχῶς· τὸ δ' ἐν μέρει καταφατικὸν διὰ τοῦ πρώτου καὶ διὰ τοῦ ἐσχάτου, μοναχῶς μὲν διὰ τοῦ πρώτου, τριχῶς δὲ διὰ τοῦ ἐσχάτου. τὸ δὲ στερητικὸν τὸ κατὰ μέρος ἐν ἅπασιν τοῖς σχήμασι δέικνυται, πλὴν ἐν μὲν τῷ πρώτῳ ἅπαξ, ἐν δὲ τῷ
 40 μέσῳ καὶ τῷ ἐσχάτῳ ἐν τῷ μὲν διχῶς ἐν τῷ δὲ τριχῶς.

43 a Φανερόν οὖν ὅτι τὸ καθόλου κατηγορικὸν κατασκευάσαι μὲν χαλεπώτατον, ἀνασκευάσαι δὲ ῥᾶστον. ὅλως δ' ἐστὶν ἀναιροῦντι μὲν τὰ καθόλου τῶν

* Barbara.
 * Cesare and Camestres.

† Celarent.
 † Darii.

clusions with all the terms except the last. *E.g.*, if the term D is added to the terms A, B and C, two further conclusions are added *ipso facto*, viz., those which are given by the relation of D severally to A and B. Similarly too in all other cases. And even if the term be introduced intermediately, the same principle holds ; for the term will form a conclusion with all the rest but one. Thus there will be many more conclusions than either terms or premisses.

XXVI. Now that we understand the scope of the syllogism, and what sort of proof can be obtained in each figure and in how many ways, it is also evident to us what kind of proposition is difficult and what is easy to deal with ; for that which is concluded in more figures and by more moods is easier, while that which is concluded in fewer figures and by fewer moods is harder to deal with.

Relative ease and difficulty of proving different types of proposition

The universal affirmative is proved only by the first figure, and by this in one ^a mood only ; but the negative is proved both by the first and by the middle figure : by the first in one ^b and by the middle in two ^c moods. The particular affirmative is proved by the first and the last figures : by the first in one ^d and by the last in three ^e moods. The particular negative is proved in all three figures, with this difference, that in the first figure it is proved in one ^f mood, while in the second and third it is proved respectively in two ^g and in three ^h moods.

Thus it is evident that the universal affirmative is the hardest to establish and the easiest to overthrow. In general, universal propositions are more open to

^a Darapti, Disamis and Datisi.

^f Ferio.

^g Festino, Baroco.

^h Felapton, Bocardo and Ferison.

43 a

ἐν μέρει ῥῆω· καὶ γὰρ ἦν μηδενὶ καὶ ἦν τινι μὴ
 ὑπάρχει ἀνῆρηται· τούτων δὲ τὸ μὲν τινὶ μὴ ἐν
 5 ἅπασιν τοῖς σχήμασι δείκνυται, τὸ δὲ μηδενὶ ἐν τοῖς
 δυσί. τὸν αὐτὸν δὲ τρόπον καὶ πὶ τῶν στερητικῶν.
 καὶ γὰρ εἰ παντὶ καὶ εἴ τινι, ἀνῆρηται τὸ ἐξ ἀρχῆς·
 τοῦτο δ' ἦν ἐν δύο σχήμασιν. ἐπὶ δὲ τῶν ἐν μέρει
 μοναχῶς, ἢ παντὶ ἢ μηδενὶ δείξαντα ὑπάρχειν.
 10 κατασκευάζοντι δὲ ῥῆω τὰ ἐν μέρει· καὶ γὰρ ἐν
 πλείοσι σχήμασι καὶ διὰ πλειόνων τρόπων.

Ὅλως τε οὐ δεῖ λανθάνειν ὅτι ἀνασκευάσαι μὲν
 δι' ἀλλήλων ἔστι καὶ τὰ καθόλου διὰ τῶν ἐν μέρει
 καὶ ταῦτα διὰ τῶν καθόλου, κατασκευάσαι δ' οὐκ
 ἔστι διὰ τῶν κατὰ μέρος τὰ καθόλου, δι' ἐκείνων δὲ
 15 ταῦτ' ἔστιν. ἅμα δὲ δῆλον ὅτι καὶ τὸ ἀνασκευάζειν
 ἔστι τοῦ κατασκευάζειν ῥῆον.

Πῶς μὲν οὖν γίγνεται πᾶς συλλογισμὸς καὶ διὰ
 πόσων ὄρων καὶ προτάσεων, καὶ πῶς ἔχουσιν πρὸς
 ἀλλήλας, ἔτι δὲ ποῖον πρόβλημα ἐν ἐκάστῳ σχήματι
 καὶ ποῖον ἐν πλείοσι καὶ ποῖον ἐν ἐλάττωσι δεί-
 κνυται, δῆλον ἐκ τῶν εἰρημένων.

20 XXVII. Πῶς δὲ εὐπορήσομεν αὐτοὶ πρὸς τὸ
 τιθέμενον αἰεὶ συλλογισμῶν, καὶ διὰ ποίας ὁδοῦ
 ληψόμεθα τὰς περὶ ἕκαστον ἀρχάς, νῦν ἤδη λεκτέον·

^a 42 b 35.

^b In chs. xxiii.-xxvi.

^c i.e. the premisses; cf. 43 b 36.

refutation than particular ones ; for the proposition is refuted not only if the predicate applies to none, but also if it does not apply to some of the subject, and of these alternatives the latter can be proved in all three figures, and the former in two of them. Similarly in the case of negative propositions ; for the hypothesis is refuted not only if the predicate applies to all but also if it applies to some of the subject, and we have seen ^a that this can be proved in two figures. But in particular propositions the refutation can only be effected in one way, by showing that the predicate applies to all, or to none. For constructive purposes, however, particular propositions are easier, since they can be proved in more figures and by more moods.

We must not fail to observe the general principle that whereas propositions can be *overthrown* reciprocally, the universal by the particular and the particular by the universal, universal propositions cannot be *established* by means of particular ones, although the latter can be established by means of the former. At the same time it is obvious also that it is easier to overthrow a proposition than to establish it.

The foregoing analysis ^b clearly shows how every syllogism is effected, and by means of how many terms and premisses, and how these are related one to another ; and also what kind of proposition is proved in each figure, and what kind is proved in more and what kind in fewer figures.

XXVII. We must next proceed to describe how we ourselves shall find an adequate supply of syllogisms to meet any given problem, and by what method we shall apprehend the starting-points ^c appropriate to each problem ; for presumably we

Construction of syllogisms.

43 a

οὐ γὰρ μόνον ἴσως δεῖ τὴν γένεσιν θεωρεῖν τῶν συλλογισμῶν, ἀλλὰ καὶ τὴν δύναμιν ἔχειν τοῦ ποιεῖν.

- 25 Ἀπάντων δὴ τῶν ὄντων τὰ μὲν ἐστὶ τοιαῦτα ὥστε κατὰ μηδενὸς ἄλλου κατηγορεῖσθαι ἀληθῶς καθόλου (οἷον Κλέων καὶ Καλλίας καὶ τὸ καθ' ἑκάστον καὶ αἰσθητόν), κατὰ δὲ τούτων ἄλλα (καὶ γὰρ ἄνθρωπος καὶ ζῶον ἐκάτερος τούτων ἐστί)· τὰ
- 30 δ' αὐτὰ μὲν κατ' ἄλλων κατηγορεῖται, κατὰ δὲ τούτων ἄλλα πρότερον οὐ κατηγορεῖται· τὰ δὲ καὶ αὐτὰ ἄλλων καὶ αὐτῶν ἕτερα, οἷον ἄνθρωπος Καλλίου καὶ ἀνθρώπου ζῶον. ὅτι μὲν οὖν ἓνα τῶν ὄντων κατ' οὐδενὸς πέφυκε λέγεσθαι δῆλον· τῶν γὰρ αἰσθητῶν σχεδὸν ἑκάστον ἐστὶ τοιοῦτον ὥστε μὴ κατηγορεῖσθαι κατὰ μηδενός, πλὴν ὡς κατὰ
- 35 συμβεβηκός· φαμὲν γάρ ποτε τὸ λευκὸν ἐκείνο Σωκράτην εἶναι καὶ τὸ προσιὸν Καλλίαν. ὅτι δὲ καὶ ἐπὶ τὸ ἄνω πορευομένοις ἴσταται ποτε, πάλιν ἐρουῖμεν· νῦν δ' ἔστω τοῦτο κείμενον. κατὰ μὲν οὖν τούτων οὐκ ἔστιν ἀποδείξαι κατηγορούμενον ἕτερον, πλὴν εἰ μὴ κατὰ δόξαν, ἀλλὰ ταῦτα κατ' ἄλλων·
- 40 οὐδὲ τὰ καθ' ἑκαστα κατ' ἄλλων ἀλλ' ἕτερα κατ' ἐκείνων. τὰ δὲ μεταξὺ δῆλον ὡς ἀμφοτέρως ἐνδέχεται· καὶ γὰρ αὐτὰ κατ' ἄλλων καὶ ἄλλα κατὰ τούτων λεχθήσεται, καὶ σχεδὸν οἱ λόγοι καὶ αἰσκέψεις εἰσὶ μάλιστα περὶ τούτων.

should not merely speculate about the formation of syllogisms, but also possess the capacity to construct them.

Now all existing things either (1) are such that they cannot be truly predicated in a universal sense of anything else (*e.g.*, Cleon and Callias and anything which is individual and sensible), but other attributes can be so predicated of them (for each of the two examples just quoted is a man and an animate being); or (2) are predicated of other things, but other things are not first predicated of them; or (3) both are themselves predicated of other things and have other things predicated of them (as 'man' is predicated of Callias and 'animal' of man). Thus it is obvious that some things are naturally predicable of nothing, for broadly speaking every sensible thing is such that it cannot be predicated of anything—except in an accidental sense; for we sometimes say 'That white thing is Socrates' or 'That which is approaching is Callias.' We shall explain elsewhere^a that there is also an upward limit to the process of predication; for the present let this be taken as assumed. It cannot be demonstrated, then, that anything else is predicated of this class of things, except by way of opinion; but they are predicated of other things. Individuals, on the other hand, are not predicated of other things, but other things are predicated of them. Things which are intermediate between universals and individuals, however, clearly admit of both processes; for they both are predicated of other things and have other things predicated of them. It is with this class of things, broadly speaking, that arguments and inquiries are chiefly concerned.

Three
classes of
predicables.

43 b Δεῖ δὴ τὰς προτάσεις περὶ ἕκαστον οὕτως ἐκ-
 λαμβάνειν, ὑποθέμενον αὐτὸ πρῶτον καὶ τοὺς
 ὁρισμούς τε καὶ ὅσα ἴδια τοῦ πράγματος ἐστίν, εἰτα
 μετὰ τοῦτο ὅσα ἔπεται τῷ πράγματι, καὶ πάλιν οἷς
 ε τοῦ πράγματος ἀκολουθεῖ, καὶ ὅσα μὴ ἐνδέχεται αὐτῷ
 ὑπάρχειν· οἷς δ' αὐτὸ μὴ ἐνδέχεται οὐκ ἐκκληπτέον,
 διὰ τὸ ἀντιστρέφειν τὸ στερητικόν. διαιρετέον δὲ
 καὶ τῶν ἐπομένων ὅσα τε ἐν τῷ τί ἐστὶ καὶ ὅσα
 ὡς ἴδια καὶ ὅσα ὡς συμβεβηκότα κατηγορεῖται, καὶ
 τούτων ποῖα δοξαστικῶς καὶ ποῖα κατ' ἀλήθειαν·
 10 ὅσῳ μὲν γὰρ ἂν πλειόνων τοιούτων εὐπορῇ τις,
 θάττον ἐντείνεται συμπεράσματι, ὅσῳ δ' ἂν ἀλη-
 θεστέρων, μᾶλλον ἀποδείξει.

Δεῖ δ' ἐκλέγειν μὴ τὰ ἐπόμενα τινί, ἀλλ' ὅσα
 ὅλην τῷ πράγματι ἔπεται, οἷον μὴ τί τινὶ ἀνθρώπῳ
 ἀλλὰ τί παντὶ ἀνθρώπῳ ἔπεται· διὰ γὰρ τῶν καθ-
 ὅλου προτάσεων ὁ συλλογισμός. ἀδιορίστου μὲν οὖν
 15 οἷτος ἄδηλον εἰ καθόλου ἢ πρότασις, διωρισμένου
 δὲ φανερόν. ὁμοίως δ' ἐκλεκτέον καὶ οἷς αὐτὸ
 ἔπεται ὅλοις, διὰ τὴν εἰρημένην αἰτίαν. αὐτὸ δὲ τὸ
 ἐπόμενον οὐ ληπτέον ὅλον ἔπεσθαι, λέγω δ' οἷον
 ἀνθρώπῳ πᾶν ζῶον ἢ μουσικῇ πᾶσαν ἐπιστήμην,
 ἀλλὰ μόνον ἀπλῶς ἀκολουθεῖν, καθάπερ καὶ προ-
 20 τευνόμεθα· καὶ γὰρ ἄχρηστον θάτερον καὶ ἀδύνατον,
 οἷον πάντα ἄνθρωπον εἶναι πᾶν ζῶον ἢ δικαιοσύνην

Now we must select the premisses connected with each problem in the following manner. We must set down (1) the subject itself, its definitions and all its properties, (2) all the concepts which are consequents of the subject, (3) the concepts of which the subject is a consequent, and (4) the attributes which cannot apply to the subject. We need not select the concepts to which it cannot apply, because the negative premiss is convertible. We must also distinguish among these consequents those which are included in the essence, those which are predicated as properties, and those which are predicated as accidents ; and of these we must distinguish those which are supposedly from those which are really associated with the subject, for the greater our supply of the latter, the sooner we shall arrive at a conclusion, and the truer they are, the more convincing will be our proof.

Method of finding premisses by selecting consequents and antecedents.

We must select consequents not of some part but of the whole of the subject, *e.g.*, not those of some individual man, but those of every man ; for it is from universal premisses that the syllogism proceeds. Thus when a statement is indefinite it is uncertain whether the premiss is universal, but when the statement is definite this is quite clear. Similarly we must select only those concepts of the whole of which the subject is a consequent, for the reason just stated. But we must not assume that the consequent is consequent as a whole ; I mean, *e.g.*, that all ' animal ' is a consequent of ' man,' or all ' scientific knowledge ' of ' music,' but only that it is a consequent, without qualification ; as indeed we express it in a proposition ; the other form of expression (*e.g.*, ' every man is every animal ' or ' probity is all good ') is

ἅπαν ἀγαθόν· ἀλλ' ὧς ἔπεται, ἐπ' ἐκείνου τὸ παντὶ λέγεται.

Ὅταν δ' ὑπό τινος περιέχεται τὸ ὑποκείμενον ὧς τὰ ἐπόμενα δεῖ λαβεῖν, τὰ μὲν τῷ καθόλου ἐπόμενα 25 ἢ μὴ ἐπόμενα οὐκ ἐκλεκτέον ἐν τούτοις (εἰληπται γὰρ ἐν ἐκείνοις· ὅσα γὰρ ζῶν καὶ ἀνθρώπῳ ἔπεται, καὶ ὅσα μὴ ὑπάρχει ὡσαύτως), τὰ δὲ περὶ ἕκαστον ἴδια ληπτέον· ἔστι γὰρ ἅττα τῷ εἶδει ἴδια παρὰ τὸ γένος· ἀνάγκη γὰρ τοῖς ἑτέροις εἶδεσιν ἴδια ἅττα ὑπάρχειν.

Οὐδὲ δὴ τῷ καθόλου ἐκλεκτέον οἷς ἔπεται τὸ 30 περιεχόμενον, οἷον ζῶν οἷς ἔπεται ἄνθρωπος· ἀνάγκη γάρ, εἰ ἀνθρώπῳ ἀκολουθεῖ τὸ ζῶν, καὶ τούτοις ἅπασιν ἀκολουθεῖν. οἰκειότερα δὲ ταῦτα τῆς τοῦ ἀνθρώπου ἐκλογῆς.

Ληπτέον δὲ καὶ τὰ ὡς ἐπὶ τὸ πολὺ ἐπόμενα καὶ οἷς ἔπεται· τῶν γὰρ ὡς ἐπὶ τὸ πολὺ προβλημάτων 35 καὶ ὁ συλλογισμὸς ἐκ τῶν ὡς ἐπὶ τὸ πολὺ προτάσεων, ἢ πασῶν ἢ τινῶν· ὁμοιον γὰρ ἐκάστου τὸ συμπέρασμα ταῖς ἀρχαῖς.

Ἔτι τὰ πᾶσιν ἐπόμενα οὐκ ἐκλεκτέον· οὐ γὰρ ἔσται συλλογισμὸς ἐξ αὐτῶν· δι' ἣν δ' αἰτίαν ἐν τοῖς ἐπομένοις ἔσται δῆλον.

XXVIII. Κατασκευάζειν μὲν οὖν βουλομένοις

* That it is useless (for purposes of argument) is probably true; but it is recognized as possible in modern logic.

^b Literally 'starting-points.'

^c i.e. of both major and minor terms. This would give a syllogism in the second figure with two affirmative premisses, from which no conclusion follows.

^d 44 b 20.

useless and impossible.^a It is to the antecedent that 'all' or 'every' is attached.

When the subject whose consequents we have to apprehend is included in some wider term, we must not select the consequents or non-consequents of the universal in dealing with the particular (for they have been apprehended already in considering the universal, for the consequents of 'animal' are consequents of 'man,' and similarly with non-consequents), but we must apprehend the consequents which are peculiar to the individual. For there are some properties which are peculiar to the species apart from the genus, since the other species must also have some properties peculiar to them.

Nor again should we in the case of the universal term select the antecedents of the subordinate term; *e.g.*, in the case of 'animal' we should not select the antecedents of 'man,' for if 'animal' is a consequent of 'man,' it must be a consequent of all these concepts as well. They belong more properly, however, to the selection of concepts associated with the term 'man.'

We must also apprehend those concepts which are usually consequents of our subject, and those of which it is usually a consequent; for the syllogism of propositions about the usual is also drawn from premisses which are usually true, either all or some of them; for the conclusion of every syllogism is similar to its original premisses.^b

Further, we must not select concepts which are consequents of all ^c the terms, because they will not produce a syllogism. Why this is so will be clear presently.^d

XXVIII. When we wish to establish a proposition

43 b

- 41 κατὰ τινος ὅλου τοῦ μὲν κατασκευαζομένου βλέπ-
 τέον εἰς τὰ ὑποκείμενα, καθ' ὧν αὐτὸ τυγχάνει
 λεγόμενον, οὐ δὲ δεῖ κατηγορεῖσθαι, ὅσα τούτῳ
 ἔπεται· ἂν γάρ τι τούτων ἢ ταυτόν, ἀνάγκη θάτερον
 θατέρῳ ὑπάρχειν. ἦν δὲ μὴ ὅτι παντὶ ἀλλ' ὅτι
 44 α τινί, οἷς ἔπεται ἑκάτερον· εἰ γάρ τι τούτων ταυτόν,
 ἀνάγκη τινὶ ὑπάρχειν. ὅταν δὲ μηδενὶ δέῃ ὑπάρ-
 χειν, ὧ¹ μὲν οὐ δεῖ ὑπάρχειν, εἰς τὰ ἐπόμενα, ὃ δὲ
 5 δεῖ μὴ ὑπάρχειν,² εἰς ἃ μὴ ἐνδέχεται αὐτῷ παρεῖναι·
 ἢ ἀνάπαλιν, ὧ μὲν δεῖ μὴ ὑπάρχειν, εἰς³ ἃ μὴ
 ἐνδέχεται αὐτῷ παρεῖναι, ὃ δὲ μὴ ὑπάρχειν, εἰς τὰ
 ἐπόμενα. τούτων γὰρ ὄντων τῶν αὐτῶν ὅποτε-
 ρωνοῦν, οὐδενὶ ἐνδέχεται θατέρῳ θάτερον ὑπάρχειν·
 γίγνεται γὰρ ὅτε μὲν ὁ ἐν τῷ πρώτῳ σχήματι
 συλλογισμός, ὅτε δ' ὁ ἐν τῷ μέσῳ. ἔαν δὲ τινὶ μὴ
 10 ὑπάρχειν, ὧ μὲν δεῖ μὴ ὑπάρχειν, οἷς ἔπεται, ὃ δὲ
 μὴ ὑπάρχειν, ἃ μὴ δυνατόν αὐτῷ ὑπάρχειν· εἰ γάρ
 τι τούτων εἴη ταυτόν, ἀνάγκη τινὶ μὴ ὑπάρχειν.

Μᾶλλον δ' ἴσως ὧδ' ἔσται τῶν λεγομένων ἕκαστον
 φανερόν. ἔστω γὰρ τὰ μὲν ἐπόμενα τῷ Α ἐφ' ὧν
 Β, οἷς δ' αὐτὸ ἔπεται ἐφ' ὧν Γ, ἃ δὲ μὴ ἐνδέχεται
 15 αὐτῷ ὑπάρχειν ἐφ' ὧν Δ· πάλιν δὲ τῷ Ε τὰ μὲν
 ὑπάρχοντα ἐφ' οἷς Ζ, οἷς δ' αὐτὸ ἔπεται ἐφ' οἷς Η,
 ἃ δὲ μὴ ἐνδέχεται αὐτῷ ὑπάρχειν ἐφ' οἷς Θ. εἰ μὲν
 οὖν ταυτό τι ἔσται τῶν Γ τινὶ τῶν Ζ, ἀνάγκη τὸ Α

¹ ὧ] ὁ m, Waitz.

² εἰς τὰ ἐπόμενα, ὃ δὲ δεῖ μὴ ὑπάρχειν om. Waitz, habent
 codd., sed ὧ δὲ pro ὃ δὲ A¹.

³ εἰς om. AB¹Cdu.

• Barbara. ^b Darapti. ^c Cesare. ^d Camestres.

• By converting the major premiss in Cesare or the minor
 in Camestres.

^f Felapton.

about a subject as a whole, we must consider (1) the subjects of which the predicate which we are trying to establish is actually asserted, and (2) the consequents of the subject whose predicate we are required to establish ; for if there is anything which is common to both classes, then the predicate must apply to the subject.^a If we are trying to establish that it applies not to all but to some, we must consider the antecedents of both terms ; for if anything is common to both classes, then one term must apply to some of the other.^b When it is required that one term shall apply to none of the other, we must consider the consequents of the subject, and the attributes which cannot belong to the predicate,^c or conversely we must consider the attributes which cannot belong to the subject and the consequents of the predicate^d ; for if any term is the same in both series, the predicate term cannot apply to any of the subject ; for a syllogism results sometimes in the first^e and sometimes in the middle figure. If it is required that one term shall not apply to some of the other, we must consider the antecedents of the subject and the attributes which cannot apply to the predicate ; for if anything is common to these two classes, it must follow that the predicate does not apply to some of the subject.^f

How to apply the method of selection to particular problems.

Perhaps the several rules stated above will be clearer if we express them in the following manner. Let the consequents of A be designated by B, the antecedents of A by C, and the attributes which cannot apply to A by D ; again, let the attributes of E be designated by F, the antecedents of E by G, and the attributes which cannot apply to E by H. Then (1) if any of the Cs is the same as any of the Fs,

Summary of the foregoing rules.

64 a

- παντί τῷ Ε ὑπάρχειν· τὸ μὲν γὰρ Ζ παντί τῷ Ε, τὸ δὲ Γ παντί τῷ Α, ὥστε παντί τῷ Ε τὸ Α. εἰ δὲ τὸ Γ καὶ τὸ Η ταυτόν, ἀνάγκη τινὶ τῶν Ε τὸ Α ὑπάρχειν· τῷ μὲν γὰρ Γ τὸ Α, τῷ δὲ Η τὸ Ε παντί ἀκολουθεῖ. εἰ δὲ τὸ Ζ καὶ τὸ Δ ταυτόν, οὐδενὶ τῶν Ε τὸ Α ὑπάρξει ἐκ προσυλλογισμοῦ· ἐπεὶ γὰρ ἀντιστρέφει τὸ στερητικὸν καὶ τὸ Ζ τῷ Δ ταυτόν, οὐδενὶ τῶν Ζ ὑπάρξει τὸ Α, τὸ δὲ Ζ παντί τῷ Ε.
- 25 πάλιν εἰ τὸ Β καὶ τὸ Θ ταυτόν, οὐδενὶ τῶν Ε τὸ Α ὑπάρξει· τὸ γὰρ Β τῷ μὲν Α παντί, τῷ δ' ἐφ' ᾧ τὸ Ε οὐδενὶ ὑπάρξει· ταυτό γὰρ ἦν τῷ Θ, τὸ δὲ Θ οὐδενὶ τῶν Ε ὑπῆρχεν. εἰ δὲ τὸ Δ καὶ τὸ Η ταυτόν, τὸ Α τινὶ τῶν Ε οὐχ ὑπάρξει· τῷ γὰρ Η οὐχ ὑπάρξει, ὅτι οὐδὲ τῷ Δ· τὸ δὲ Η ἐστὶν ὑπὸ τὸ Ε, ὥστε τινὶ τῶν Ε οὐχ ὑπάρξει. εἰ δὲ τῷ Η τὸ Β ταυτόν, ἀντεστραμμένος ἔσται συλλογισμός· τὸ μὲν γὰρ Ε¹ τῷ Α ὑπάρξει παντί—τὸ γὰρ Β τῷ Α, τὸ δὲ Ε τῷ Β (ταυτό γὰρ ἦν τῷ Η)· τὸ δὲ Α τῷ Ε παντί μὲν οὐκ ἀνάγκη ὑπάρχειν, τινὶ δ' ἀνάγκη διὰ τὸ
- 35 ἀντιστρέφειν τῇ καθόλου κατηγορίᾳ τὴν κατὰ μέρος.

Φανερόν οὖν ὅτι εἰς τὰ προειρημένα βλεπτέον ἑκατέρου καθ' ἑκαστον πρόβλημα· διὰ τούτων γὰρ ἅπαντες οἱ συλλογισμοί. δεῖ δὲ καὶ τῶν ἐπομένων, καὶ οἷς ἔπεται ἑκαστον, εἰς τὰ πρῶτα καὶ τὰ καθόλου μάλιστα βλέπειν, οἷον τοῦ μὲν Ε μᾶλλον εἰς

40 τὸ ΚΖ ἢ εἰς τὸ Ζ μόνον, τοῦ δὲ Α εἰς τὸ ΚΓ ἢ εἰς τὸ Γ μόνον. εἰ μὲν γὰρ τῷ ΚΖ ὑπάρχει τὸ Α, καὶ τῷ Ζ καὶ τῷ Ε ὑπάρχει· εἰ δὲ τούτῳ μὴ ἔπεται,

¹ τῷ corr. Af; τὸ Bdun.² E AB²Cd²n² : H B¹d¹f¹mn¹.

A must apply to all E ; for F applies to all E, and C applies to all A, so that A applies to all E. (2) If C and G are the same, A must apply to some E. For A is a consequent of all C, and E of all G. (3) If F and D are the same, by a prosyllogism A will apply to no E ; for since the negative proposition is convertible, and F is the same as D, A will apply to no F ; but F applies to all E. (4) Again, if B and H are the same, A will apply to no E ; for B will apply to all A, but to no E ; for B is *ex hypothesi* the same as H, and we assumed that H applies to no E. (5) If D and G are the same, A will not apply to some E. For it will not apply to G, inasmuch as it does not apply to D. But G falls under E, and so A will not apply to some E. (6) If B is the same as G, there will be a syllogism by conversion. For E will apply to all A, since B applies to A and E to B (since B is *ex hypothesi* the same as G). It does not necessarily follow, however, that A applies to all E, but only that it applies to some, because the universal is convertible into a particular statement.

Thus it is evident that in the proving of every proposition we must consider the foregoing relations of subject and predicate ; for it is by these that all syllogisms are determined. Moreover we must consider especially those of the consequents and antecedents of each term which are primary and universal; *e.g.*, in the case of E we must consider KF rather than F alone, and in the case of A we must consider KC rather than C alone.^a For if A applies to KF it applies both to F and to E, but if it is not a consequent of the latter, it may still be a consequent of F.

Terms
should be
considered
in their
most uni-
versal form.

^a KF and KC are universals which include F and C respectively.

44 b

ἐγχωρεῖ τῷ Ζ ἔπεσθαι. ὁμοίως δὲ καὶ ἐφ' ὧν αὐτὸ ἀκολουθεῖ σκεπτέον· εἰ μὲν γὰρ τοῖς πρώτοις, καὶ τοῖς ὑπ' ἐκείνα ἔπεται, εἰ δὲ μὴ τούτοις, ἀλλὰ τοῖς ὑπὸ ταῦτα ἐγχωρεῖ.

Δῆλον δὲ καὶ ὅτι διὰ τῶν τριῶν ὄρων καὶ τῶν δύο προτάσεων ἢ σκέψις, καὶ διὰ τῶν προειρημένων σχημάτων οἱ συλλογισμοὶ πάντες. δεικνύται γὰρ ὑπάρχειν μὲν παντὶ τῷ Ε τὸ Α, ὅταν τῶν Γ καὶ Ζ ταυτόν τι ληφθῇ. τοῦτο δ' ἔσται μέσον, ἄκρα δὲ τὸ Α καὶ Ε· γίννεται οὖν τὸ πρῶτον σχῆμα. τινὶ δέ, ὅταν τὸ Γ καὶ τὸ Η ληφθῇ ταυτόν· τοῦτο δὲ τὸ ἔσχατον σχῆμα, μέσον γὰρ τὸ Η γίννεται. μηδενὶ δέ, ὅταν τὸ Δ καὶ τὸ Ζ ταυτόν. οὕτω δὲ καὶ τὸ πρῶτον σχῆμα καὶ τὸ μέσον, τὸ μὲν πρῶτον ὅτι οὐδενὶ τῷ Ζ ὑπάρχει τὸ Α, εἴπερ ἀντιστρέφει τὸ στερητικόν, τὸ δὲ Ζ παντὶ τῷ Ε, τὸ δὲ μέσον ὅτι τὸ Δ τῷ μὲν Α οὐδενὶ τῷ δὲ Ε παντὶ ὑπάρχει. τινὶ δὲ μὴ ὑπάρχειν, ὅταν τὸ Δ καὶ τὸ Η ταυτόν ᾗ. τοῦτο δὲ τὸ ἔσχατον σχῆμα· τὸ μὲν γὰρ Α οὐδενὶ τῷ Η ὑπάρξει, τὸ δὲ Ε παντὶ τῷ Η.

Φανερόν οὖν ὅτι διὰ τῶν προειρημένων σχημάτων οἱ συλλογισμοὶ πάντες, καὶ ὅτι οὐκ ἐκλεκτέον ὅσα πᾶσιν ἔπεται, διὰ τὸ μηδένα γίνεσθαι συλλογισμὸν ἐξ αὐτῶν. κατασκευάζειν μὲν γὰρ ὅλως οὐκ ἦν ἐκ τῶν ἐπομένων, ἀποστερεῖν δ' οὐκ ἐνδέχεται διὰ τοῦ πᾶσιν ἐπομένου· δεῖ γὰρ τῷ μὲν ὑπάρχειν τῷ δὲ μὴ ὑπάρχειν.

• Cf. 43 b 36.

• 27 a 18, b 23.

• i.e. from two affirmative premisses which state the middle

Similarly we must observe the antecedents of the term in question ; for if it is a consequent of those which are primary, so it is also of the terms which fall under these ; but if it is not a consequent of the former, it may still be so of the latter.

It is clear also that our inquiry is carried out by means of the three terms and two premisses, and that all the syllogisms are effected by means of the three figures already described. For it is proved (1) that A applies to all E when one of the Cs is taken as identical with one of the Fs. This will be the middle term, and the extremes will be A and E. Thus the first figure results. (2) That A applies to some E when C and G are taken as identical. This is the last figure ; for G becomes the middle term. (3) That A applies to no E when D and F are identical. In this case we get both the first and the middle figure ; the first because A applies to no F (the negative proposition being converted) and F applies to all E, and the middle figure because D applies to no A but to all E. (4) That A does not apply to some E when D and G are identical. This is the last figure, for A will apply to no G and E will apply to all G.

The method of selection proceeds by the ordinary rules of syllogism.

Thus it is evident that all syllogisms are effected by means of the figures already described, and that we must not select consequents of all the terms,^a because no syllogism results from these. For we saw^b that there is no way at all of establishing a proposition from consequents,^c while on the other hand refutation is impossible by means of a common consequent, because it should apply to one term but not to the other.^d

Consequents alone are useless for proving a syllogism.

as a common consequent of both the extreme terms (second figure).

^a Sc. to give a negative conclusion.

44 b

25 Φανερόν δὲ καὶ ὅτι αἱ ἄλλαι σκέψεις τῶν κατὰ τὰς ἐκλογὰς ἀχρεῖοι πρὸς τὸ ποιεῖν συλλογισμόν, οἷον εἰ τὰ ἐπόμενα ἐκατέρῳ ταυτὰ ἐστίν, ἢ εἰ οἷς ἔπεται τὸ Α καὶ ἄ μὴ ἐνδέχεται τῷ Ε, ἢ ὅσα πάλιν μὴ ἐγχωρεῖ ἐκατέρῳ ὑπάρχειν· οὐ γὰρ γίγνεται
 30 συλλογισμὸς διὰ τούτων. εἰ μὲν γὰρ τὰ ἐπόμενα ταυτὰ, οἷον τὸ Β καὶ τὸ Ζ, τὸ μέσον γίγνεται σχῆμα κατηγορικὰς ἔχον τὰς προτάσεις· εἰ δ' οἷς ἔπεται τὸ Α καὶ ἄ μὴ ἐνδέχεται τῷ Ε, οἷον τὸ Γ καὶ τὸ Θ, τὸ πρῶτον σχῆμα στερητικὴν ἔχον τὴν πρὸς τὸ ἐλαττον ἄκρον πρότασιν. εἰ δ' ὅσα μὴ ἐνδέχεται
 35 ἐκατέρῳ, οἷον τὸ Δ καὶ τὸ Θ, στερητικαὶ ἀμφοτέραι αἱ προτάσεις, ἢ ἐν τῷ πρώτῳ ἢ ἐν τῷ μέσῳ σχήματι· οὕτως δ' οὐδαμῶς ἔσται συλλογισμὸς.

Δῆλον δὲ καὶ ὅτι ὅποια ταυτὰ ληπτέον τὰ κατὰ τὴν ἐπίσκεψιν, καὶ οὐχ ὅποια ἕτερα ἢ ἐναντία,
 40 πρῶτον μὲν ὅτι τοῦ μέσου χάριν ἢ ἐπίβλεψις, τὸ
 45 δὲ μέσον οὐχ ἕτερον ἀλλὰ ταυτόν δεῖ λαβεῖν. εἰτα ἐν ὅσοις καὶ συμβαίνει γίνεσθαι συλλογισμόν τῷ ληφθῆναι ἐναντία ἢ μὴ ἐνδεχόμενα τῷ αὐτῷ ὑπάρχειν, εἰς τοὺς προειρημένους ἅπαντα ἀναχθήσεται τρόπους, οἷον εἰ τὸ Β καὶ τὸ Ζ ἐναντία ἢ μὴ
 5 ἐνδέχεται τῷ αὐτῷ ὑπάρχειν· ἔσται μὲν γὰρ τούτων ληφθέντων συλλογισμὸς ὅτι οὐδενὶ τῶν Ε τὸ Α ὑπάρχει ἀλλ' οὐκ ἐξ αὐτῶν ἀλλ' ἐκ τοῦ προειρημένου τρόπου· τὸ γὰρ Β τῷ μὲν Α παντὶ τῷ δὲ Ε

It is evident also that all other methods of investigation which proceed by selection are useless for producing a syllogism ; *e.g.*, (*a*) if the consequents of both terms are identical, or (*b*) if the antecedents of A and the attributes which cannot apply to E are identical ; or again (*c*) if the attributes which cannot apply to either are identical ; because no syllogism results from these conditions. For (*a*) if the consequents, viz. B and F, are identical, we get the third figure with both premisses affirmative ; (*b*) if the antecedents of A and the attributes which cannot apply to E, viz. C and H respectively, are identical, we get the first figure with a negative minor premiss ; and (*c*) if the attributes which cannot apply to either of the terms A and E, viz. D and H, are identical, both premisses are negative, either in the first or in the middle figure. In these circumstances no syllogism at all is possible.

Other methods of selection are also useless.

It is clear also that we must apprehend which of the terms that come under our survey are the same, and not which are different or contrary ; firstly, because the object of our investigation is to discover the middle term, and the middle term must be taken as the same in each premiss, and not as something different. Secondly, even those examples in which a syllogism happens to result from taking attributes which are contrary or which cannot apply to the same subject, will all be reducible to the types which we have already described ; *e.g.*, if B and F are contrary or cannot apply to the same subject. For if we take these terms, there will be a syllogism to the effect that A applies to no E, but the conclusion will be drawn not from the terms as they stand but from the type described above.^a For B will apply to all A

It is for identity between the two groups of terms that we must look.

45 a

- οὐδενὶ ὑπάρξει, ὥστ' ἀνάγκη ταὐτὸ εἶναι τὸ Β τινὶ
 10 τῶν Θ. πάλιν εἰ τὸ Β καὶ Η μὴ ἐγχωρεῖ τῷ αὐτῷ
 παρεῖναι, ὅτι τινὶ τῶν Ε οὐχ ὑπάρξει τὸ Α· καὶ γὰρ
 οὕτως τὸ μέσον ἔσται σχῆμα· τὸ γὰρ Β τῷ μὲν Α
 παντὶ τῷ δὲ Ε¹ οὐ τινὶ² ὑπάρξει, ὥστ' ἀνάγκη τὸ
 Β ταὐτόν τινι εἶναι τῶν Θ. τὸ γὰρ μὴ ἐνδέχεσθαι
 τὸ Β καὶ τὸ Η τῷ αὐτῷ ὑπάρχειν οὐδὲν διαφέρει ἢ
 15 τὸ Β τῶν Θ τινὶ ταὐτόν εἶναι· πάντα γὰρ εἰληπται
 τὰ μὴ ἐνδεχόμενα τῷ Ε ὑπάρχειν.

Φανερόν μὲν οὖν ὅτι ἐξ αὐτῶν μὲν τούτων τῶν
 ἐπιβλέψεων οὐδεὶς γίνεταί συλλογισμός, ἀνάγκη
 δ', εἰ³ τὸ Β καὶ τὸ Ζ ἐναντία, ταὐτόν τινι εἶναι τὸ
 20 Β τῶν Θ καὶ τὸν συλλογισμόν γίνεσθαι διὰ τούτων.
 συμβαίνει δὴ τοῖς οὕτως ἐπισκοποῦσι προσεπι-
 βλέπειν ἄλλην ὁδὸν τῆς ἀναγκαίας διὰ τὸ λανθάνειν
 τὴν ταυτότητα τῶν Β καὶ τῶν Θ.

XXIX. Τὸν αὐτὸν δὲ τρόπον ἔχουσι καὶ οἱ εἰς τὸ
 ἀδύνατον ἄγοντες συλλογισμοὶ τοῖς δεικτικοῖς· καὶ
 25 γὰρ οὗτοι γίνονται διὰ τῶν ἐπομένων καὶ οἷς
 ἔπεται ἐκάτερον. καὶ ἡ αὕτῃ ἐπίβλεψις ἐν ἀμφοῖν·
 ὁ γὰρ δείκνυται δεικτικῶς καὶ διὰ τοῦ ἀδυνάτου
 ἔστι συλλογίσασθαι διὰ τῶν αὐτῶν ὄρων, καὶ ὁ διὰ
 τοῦ ἀδυνάτου καὶ δεικτικῶς· οἷον ὅτι τὸ Α οὐδενὶ
 τῶν Ε ὑπάρχει. κείσθω γὰρ τινὶ ὑπάρχειν· οὐκοῦν
 30 ἐπεὶ τὸ Β παντὶ τῷ Α τὸ δὲ Α τινὶ τῶν Ε, τὸ Β τινὶ
 τῶν Ε ὑπάρξει· ἀλλ' οὐδενὶ ὑπῆρχεν. πάλιν ὅτι
 τινὶ ὑπάρχει· εἰ γὰρ μηδενὶ τῶν Ε τὸ Α τὸ δὲ Ε

¹ EB¹u¹: H uolgo.² οὐ τινὶ Waitz: οὐδενὶ codd.³ ἀνάγκη δ', εἰ Bnu, Waitz: ἴαν δὲ ACdsm.

but to no E, and so B must be the same as some H. Again, if B and G cannot apply to the same subject, there will be a syllogism to the effect that A will not apply to some E. In this case too we shall have the middle figure, because B will apply to all A but not to some E, so that B must be the same as some H. For the statement 'B and G cannot apply to the same subject' is equivalent to 'B is the same as some H'; since H has been assumed^a to designate all the attributes which cannot apply to E.

Thus it is evident that no syllogism results from the foregoing methods of investigation as they stand, but that if B and F are contrary, B must be the same as some H, and in this way the syllogism is obtained. Thus it follows that those who consider the problem in the manner which has just been described are looking for a further method of proof than they need, through overlooking the identity between the Bs and Hs.

XXIX. Syllogisms which employ reduction *ad impossibile* are governed by the same conditions as those which are ostensive; for they too are effected by means of the consequents and antecedents of the two extreme terms. The method of investigation, too, is the same in both types; for that which is proved ostensively can be established *per impossibile* by means of the same terms, and *vice versa*: e.g., that A applies to no E.^b For let it be assumed that it applies to some. Then since B applies to all A, and A to some E, B will apply to some E. But *ex hypothesi* it applies to none. Again, it can be proved that A applies to some E; for if it applies to none, and

The same principles apply to syllogisms which are established *per impossibile*.

^b The relations of these terms are still as assumed in ch. xxviii.

45 a

παντὶ τῷ Η, οὐδενὶ τῶν Η ὑπάρξει τὸ Α· ἀλλὰ παντὶ ὑπῆρχεν. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων
 25 προβλημάτων· αἰεὶ γὰρ ἔσται καὶ ἐν ἅπασιν ἢ διὰ τοῦ ἀδυνάτου δεῖξιν ἐκ τῶν ἐπομένων καὶ οἷς ἔπεται ἐκάτερον.

Καὶ καθ' ἕκαστον πρόβλημα ἢ αὐτὴ σκέψιν δεικτικῶς τε βουλομένῳ συλλογίσασθαι καὶ εἰς τὸ ἀδύνατον ἀγαγεῖν· ἐκ γὰρ τῶν αὐτῶν ὄρων ἀμφοτέραι αἰ ἀποδείξεις· οἷον εἰ δέδεικται μηδενὶ ὑπάρ-
 40 χειν τῷ Ε τὸ Α, ὅτι συμβαίνει καὶ τὸ Β τινὶ τῶν Ε ὑπάρχειν, ὅπερ ἀδύνατον· εἰς ληφθῇ τῷ μὲν Ε
 45 b μηδενὶ τῷ δὲ Α παντὶ ὑπάρχειν τὸ Β, φανερόν ὅτι οὐδενὶ τῷ Ε τὸ Α ὑπάρξει. πάλιν εἰ δεικτικῶς συλλελόγισται τὸ Α τῷ Ε μηδενὶ ὑπάρχειν, ὑποθεμένοις ὑπάρχειν τινὶ διὰ τοῦ ἀδυνάτου δειχθήσεται οὐδενὶ ὑπάρχον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων·
 5 ἐν ἅπασιν γὰρ ἀνάγκη κοινόν τινα λαβεῖν ὅρον ἄλλον τῶν ὑποκειμένων, πρὸς ὃν ἔσται τοῦ ψευδοῦς ὁ συλλογισμός, ὥστ' ἀντιστραφείσης ταύτης τῆς προτάσεως τῆς δ' ἐτέρας ὁμοίως ἐχούσης, δεικ-
 10 τικὸς ἔσται ὁ συλλογισμός διὰ τῶν αὐτῶν ὄρων. διαφέρει γὰρ ὁ δεικτικὸς τοῦ εἰς τὸ ἀδύνατον ὅτι ἐν μὲν τῷ δεικτικῷ κατ' ἀλήθειαν ἀμφοτέραι τίθενται αἱ προτάσεις, ἐν δὲ τῷ εἰς τὸ ἀδύνατον ψευδῶς ἢ μία.

Ταῦτα μὲν οὖν ἔσται μᾶλλον φανερά διὰ τῶν ἐπομένων, ὅταν περὶ τοῦ ἀδυνάτου λέγωμεν· νῦν δὲ τοσοῦτον ἡμῖν ἔστω δῆλον, ὅτι εἰς ταῦτα¹ βλέπτεον
 15 δεικτικῶς τε βουλομένῳ συλλογίζεσθαι καὶ εἰς τὸ

¹ ταῦτα corr. C: ταῦτα codd.

* i.e. is replaced by its contradictory.

^b II. xiv.

E applies to all G, A will apply to no G ; but *ex hypothesi* it applies to all. Similarly with all other propositions ; proof *per impossibile* will always be possible in all cases by means of the consequents and antecedents of the extreme terms.

Moreover, in every problem the procedure is the same whether it is required to employ an ostensive syllogism or reduction *ad impossibile* ; for both proofs are effected by means of the same terms. *E.g.*, supposing that it has been proved that A applies to no E, because (if A applies to some) it follows that B also applies to some E, which is impossible : if it is assumed that B applies to no E but to all A, it is evident that A will apply to no E. On the other hand if the conclusion that A applies to no E has been reached ostensively, if we assume that A applies to some E, we can prove *per impossibile* that it applies to none. Similarly too in all other examples ; for in every case we must take some common term (other than those which have been laid down) to which the syllogism proving the false conclusion will refer, so that when this premiss is converted^a (the other remaining unchanged) the syllogism will become ostensive by means of the same terms. For the difference between ostensive proof and proof *per impossibile* is that in the former both premisses are assumed as true, while in the latter one is assumed as false.

These points will become clearer in the light of subsequent remarks when we are discussing proof *per impossibile*.^b For the present let us take it that so much is obvious : that we must have regard to the same terms whether it is required to prove a conclusion ostensively or to employ reduction *ad impossibile*. In

45 b

ἀδύνατον ἀγαγεῖν. ἐν δὲ τοῖς ἄλλοις συλλογισμοῖς τοῖς ἐξ ὑποθέσεως, οἷον ὅσοι κατὰ μετάληψιν ἢ κατὰ ποιότητα, ἐν τοῖς ὑποκειμένοις οὐκ ἐν τοῖς ἐξ ἀρχῆς ἀλλ' ἐν τοῖς μεταλαμβανομένοις ἔσται ἡ σκέψις, ὃ δὲ τρόπος ὁ αὐτὸς τῆς ἐπιβλέψεως.
 20 ἐπισκέψασθαι δὲ δεῖ καὶ διελεῖν ποσαχῶς οἱ ἐξ ὑποθέσεως.

Δείκνυται μὲν οὖν ἕκαστον τῶν προβλημάτων οὕτως, ἔστι δὲ καὶ ἄλλον τρόπον ἔνια συλλογίσασθαι τούτων, οἷον τὰ καθόλου διὰ τῆς κατὰ μέρος ἐπιβλέψεως ἐξ ὑποθέσεως. εἰ γὰρ τὰ Γ καὶ τὰ Η
 25 ταῦτά εἴη, μόνοις δὲ ληφθείη τοῖς Η τὸ Ε ὑπάρχειν, παντὶ ἂν τῷ Ε τὸ Α ὑπάρχοι καὶ πάλιν εἰ τὰ Δ καὶ Η ταῦτά, μόνων δὲ τῶν Η τὸ Ε κατηγοροῖτο, ὅτι οὐδενὶ τῶν Ε τὸ Α ὑπάρξει. φανερόν οὖν ὅτι καὶ οὕτως ἐπιβλεπτέον.

Τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἀναγκαίων καὶ
 30 τῶν ἐνδεχομένων· ἡ γὰρ αὕτη σκέψις καὶ διὰ τῶν αὐτῶν ὅρων ἔσται τῇ τάξει τοῦ τ' ἐνδέχεσθαι καὶ τοῦ ὑπάρχειν ὁ συλλογισμός. ληπτέον δ' ἐπὶ τῶν ἐνδεχομένων καὶ τὰ μὴ ὑπάρχοντα δυνατὰ δ' ὑπάρχειν· δέδεικται γὰρ ὅτι καὶ διὰ τούτων γίγνεται ὁ τοῦ ἐνδέχεσθαι συλλογισμός. ὁμοίως δ'
 35 ἔξει καὶ ἐπὶ τῶν ἄλλων κατηγοριῶν.

Φανερόν οὖν ἐκ τῶν εἰρημένων οὐ μόνον ὅτι ἐγγωρεῖ διὰ ταύτης τῆς ὁδοῦ γίνεσθαι πάντας τοὺς συλλογισμούς, ἀλλὰ καὶ ὅτι δι' ἄλλης ἀδύνατον.

* Cf. 41 a 39.

* *A fortiori* or analogical arguments (Alexander 324. 19).

* e.g., the hypothesis in the immediately following examples, that E applies to G only. 32 b 25 ff.

* i.e. propositions expressing a modal relation other than that of necessity or possibility.

the case of other hypothetical syllogisms, however, *e.g.*, such as involve substitution^a or a qualitative relation,^b inquiry will be concerned not with the terms originally assumed but with those which are substituted, while the manner of investigation will be the same as before. We must, however, consider and analyse the different types of hypothetical syllogisms.

Every kind of proposition, then, can be proved in the way described above ; but some can be established syllogistically in another way also. *E.g.*, universal propositions can be proved by the method of investigation proper to the corresponding particular conclusion, with the help of a further hypothesis.^c For assuming that C and G are identical, and E applies to G only, A will apply to all E ; and again assuming that D and G are identical, and E is predicated only of G, it follows that A will apply to no E. Thus it is evident that we must consider the problem in this way also.

The same method applies also to apodeictic and problematic syllogisms ; for the process of inquiry is the same, and the syllogisms will be effected by means of the same arrangement of terms, whether it is problematic or assertoric. In the case of problematic propositions, however, we must include those terms which, although they do not apply, might possibly do so ; for it has been shown^d that the problematic syllogism is effected by means of these also. The same principle will hold good in the other modes of predication.^e

Thus it is evident from the foregoing analysis not only that all syllogisms can be effected by this method, but also that they cannot be effected by any

Method of proving universal from particular syllogisms with the aid of a further hypothesis.

The method of selection is the same for all modes.

- 45 ^b ἅπας μὲν γὰρ συλλογισμὸς δέδεικται διὰ τινος τῶν
 40 προειρημένων σχημάτων γιγνόμενος, ταῦτα δ' οὐκ
 ἐγχωρεῖ δι' ἄλλων συσταθῆναι πλήν διὰ τῶν ἐπο-
 45 μένων καὶ οἷς ἔπεται ἕκαστον· ἐκ τούτων γὰρ αἱ
 προτάσεις καὶ ἡ τοῦ μέσου λήψις, ὥστ' οὐδὲ συλ-
 λογισμὸν ἐγχωρεῖ γίγνεσθαι δι' ἄλλων.

XXX. Ἡ μὲν οὖν ὁδὸς κατὰ πάντων ἡ αὐτὴ καὶ
 περὶ φιλοσοφίαν καὶ περὶ τέχνην ὅποιαν οὖν καὶ
 5 μᾶθημα· δεῖ γὰρ τὰ ὑπάρχοντα καὶ οἷς ὑπάρχει
 περὶ ἑκάτερον ἄθρεῖν, καὶ τούτων ὡς πλείστων
 εὐπορεῖν, καὶ ταῦτα διὰ τῶν τριῶν ὁρῶν σκοπεῖν,
 ἀνασκευάζοντα μὲν ὠδί, κατασκευάζοντα δὲ ὠδί,
 κατὰ μὲν ἀλήθειαν ἐκ τῶν κατ' ἀλήθειαν δια-
 γεγραμμένων ὑπάρχειν, εἰς δὲ τοὺς διαλεκτικούς
 10 συλλογισμοὺς ἐκ τῶν κατὰ δόξαν προτάσεων.

Αἱ δ' ἀρχαὶ τῶν συλλογισμῶν καθόλου μὲν
 εἴρηνται, ὃν τρόπον τ' ἔχουσι καὶ ὃν τρόπον δεῖ
 θηρεύειν αὐτάς, ὅπως μὴ βλέπωμεν εἰς ἅπαντα τὰ
 λεγόμενα, μηδ' εἰς ταῦτα κατασκευάζοντες καὶ
 ἀνασκευάζοντες, μηδὲ κατασκευάζοντές τε κατὰ
 15 παντὸς ἢ τινὸς καὶ ἀνασκευάζοντες ἀπὸ πάντων ἢ
 τινῶν, ἀλλ' εἰς ἐλάττω καὶ ὠρισμένα, καθ' ἕκαστον
 δὲ ἐκλέγειν τῶν ὄντων, οἷον περὶ ἀγαθοῦ ἢ ἐπι-
 στήμης.

Ἰδία¹ δὲ καθ' ἑκάστην εἰσὶν αἱ πλείσται. διὸ
 τὰς μὲν ἀρχὰς τὰς περὶ ἕκαστον ἐμπειρίας ἐστὶ
 παραδοῦναι. λέγω δ' οἷον τὴν ἀστρολογικὴν μὲν

¹ ἕκαστον mu, Bekker.

² ἰδία Alexander, Waitz: ἰδίᾳ codd.

• i.e. the premisses.

other. For it has been proved that every syllogism is effected by means of one of the figures already described, and these cannot be composed otherwise than by means of the consequents and antecedents of the terms in each particular case ; for it is from these that the premisses are formed and the middle term discovered. Hence a syllogism cannot be effected by any other terms than these.

XXX. The method, then, is the same in all cases, not only in philosophy but in every kind of art or study. We must look for the attributes and subjects of both our terms, and supply ourselves with as many as we can ; and then we must consider them by means of the three terms, refuting in this way, establishing in that ; when our object is truth, working from terms which are arranged to express a true relation, and when we require dialectical syllogisms, working from plausible premisses.

The same method holds for all branches of knowledge.

The principles ^a of syllogisms have now been described in general terms, both how they are constituted and how we should look for them ; not by considering all that is predicated of the terms in question, nor by considering the same attributes whether we are establishing or refuting a proposition, nor whether we are establishing it of all or some or refuting it of all or some ; but by considering a limited number of definite attributes. We must select with regard to each particular thing that is, *e.g.*, with regard to goodness or knowledge.

The general rules have now been stated,

Most of the principles, however, which are connected with a particular science are peculiar to it. Hence to convey to us the principles connected with each particular science is the task of experience. I mean, *e.g.*, that it is for astronomical experience to

but in every science knowledge of the facts must precede demonstration.

46 a

20 ἐμπειρίαν τῆς ἀστρολογικῆς ἐπιστήμης· ληφθέντων
 γὰρ ἱκανῶς τῶν φαινομένων οὕτως εὐρέθησαν αἱ
 ἀστρολογικαὶ ἀποδείξεις. ὁμοίως δὲ καὶ περὶ
 ἄλλην ὅποιαν οὖν ἔχει τέχνην τε καὶ ἐπιστήμην.
 ὥστ' εἰ ἂν ληφθῇ τὰ ὑπάρχοντα περὶ ἕκαστον,
 ἡμέτερον ἤδη τὰς ἀποδείξεις ἐτοίμως ἐμφανίζειν.
 25 εἰ γὰρ μηδὲν κατὰ τὴν ἱστορίαν παραλειφθείη τῶν
 ἀληθῶς ὑπαρχόντων τοῖς πράγμασιν, ἔχομεν περὶ
 ἅπαντος οὐ μὲν ἔστιν ἀπόδειξις, ταύτην εὐρεῖν καὶ
 ἀποδεικνύναι, οὐ δὲ μὴ πέφυκεν ἀπόδειξις, τοῦτο
 ποιεῖν φανερόν.

Καθόλου μὲν οὖν, ὃν δεῖ τρόπον τὰς προτάσεις
 ἐκλέγειν, εἴρηται σχεδόν· δι' ἀκριβείας δὲ δι-
 30 εληλύθαμεν ἐν τῇ πραγματείᾳ τῇ περὶ τὴν δια-
 λεκτικὴν.

XXXI. Ὅτι δὲ ἡ διὰ τῶν γενῶν διαίρεσις μικρόν
 τι μόριόν ἐστι τῆς εἰρημένης μεθόδου, ῥάδιον ἰδεῖν·
 ἔστι γὰρ ἡ διαίρεσις ὅλον ἀσθενὲς συλλογισμός· ὃ
 μὲν γὰρ δεῖ δεῖξαι αἰτεῖται, συλλογίζεται δὲ αἰεὶ τι
 35 τῶν ἄνωθεν. πρῶτον δ' αὐτὸ τοῦτο ἐλελήθει τοὺς
 χρωμένους αὐτῇ πάντας, καὶ πείθειν ἐπεχείρουν ὡς
 ὄντος δυνατοῦ περὶ οὐσίας ἀπόδειξιν γίγνεσθαι καὶ
 τοῦ τί ἐστίν· ὥστ' οὔτε ὃ τι ἐνδέχεται συλλογι-
 σασθαι διαιρουμένους¹ ξυνίεσαν, οὔτε ὅτι οὕτως
 ἐνεδέχετο ὥσπερ εἰρήκαμεν. ἐν μὲν οὖν ταῖς ἀπο-
 40 δείξεσιν, ὅταν δέῃ τι συλλογίσασθαι ὑπάρχειν, δεῖ
 46 b τὸ μέσον, δι' οὗ γίγνεται ὁ συλλογισμός, καὶ ἦττον

¹ διαιρουμένους nm, Alexander, Waitz: διαιρούμενοι.

convey to us the principles of astronomy (for it was not until the phenomena had been thoroughly apprehended that the demonstrations of astronomy were discovered); and the same applies to any other art or science. So if we apprehend the attributes of the object in question, it will at once be in our power readily to exhibit the demonstrations; for assuming that none of the true attributes of the objects concerned has been omitted in our survey, we shall be able to discover and demonstrate the proof of everything which has a proof, and to elucidate everything whose nature does not admit of proof.

The foregoing is a rough description in general terms of the way in which the premisses should be selected. We have considered this subject with detailed accuracy in our treatise on dialectic.^a

XXXI. It is easy to see that the process of division by genera^b is a minor instance of the method described above; for the division is, as it were, a weak syllogism, since it begs the point which it is required to prove, and always reaches a more general conclusion than is required. In the first place this fact had escaped all the exponents of the process; and they tried to insist that it is possible to effect a demonstration of substance and essence. Hence they did not understand what syllogistic conclusion can be reached by the process of division, nor did they realize that it can be reached in the way which we have described. In demonstrations when it is required to prove syllogistically an affirmative proposition, the middle term, by means of which the syllogism is effected, must always be subordinate to

Criticism
of the
Platonic
definition by
dichotomy.

^b The Platonic method of dichotomy. Cf. *Sophist* 219 A ff., *Politicus* 258 B ff.

46 b

ἀεὶ εἶναι καὶ μὴ καθόλου τοῦ πρώτου τῶν ἄκρων·
ἡ δὲ διαίρεσις τοῦναντίον βούλεται· τὸ γὰρ καθόλου
λαμβάνει μέσον.

Ἐστω γὰρ ζῶον μὲν ἐφ' οὗ Α, τὸ δὲ θνητὸν ἐφ'
5 οὗ Β, καὶ ἀθάνατον ἐφ' οὗ Γ, ὁ δ' ἄνθρωπος, οὗ τὸν
ὄρον δεῖ λαβεῖν, ἐφ' οὗ τὸ Δ. ἅπαν δὴ ζῶον λαμ-
βάνει ἢ θνητὸν ἢ ἀθάνατον· τοῦτο δ' ἐστίν, ὃ ἂν ᾗ
Α, ἅπαν εἶναι ἢ Β ἢ Γ. πάλιν τὸν ἄνθρωπον ἀεὶ
διαιρούμενος τίθεται ζῶον εἶναι, ὥστε κατὰ τοῦ
Δ τὸ Α λαμβάνει ὑπάρχειν. ὁ μὲν οὖν συλλογισμὸς
10 ἐστίν ὅτι τὸ Δ ἢ Β ἢ Γ ἅπαν ἔσται, ὥστε τὸν
ἄνθρωπον ἢ θνητὸν μὲν ἢ ἀθάνατον ἀναγκαῖον
εἶναι, ζῶον θνητὸν δὲ οὐκ ἀναγκαῖον, ἀλλ' αἰτεῖται·
τοῦτο δ' ἦν ὃ ἔδει συλλογίσασθαι. καὶ πάλιν
θέμενος τὸ μὲν Α ζῶον θνητόν, ἐφ' οὗ δὲ τὸ Β
ὑπόπουν, ἐφ' οὗ δὲ τὸ Γ ἄπουν, τὸν δ' ἄνθρωπον τὸ
15 Δ, ὡσαύτως λαμβάνει τὸ μὲν Α ἤτοι ἐν τῷ Β ἢ ἐν
τῷ Γ εἶναι (ἅπαν γὰρ ζῶον θνητὸν ἢ ὑπόπουν ἢ
ἄπουν ἐστὶ), κατὰ δὲ τοῦ Δ τὸ Α (τὸν γὰρ ἄνθρωπον
ζῶον θνητὸν εἶναι ἔλαβεν)· ὥστ' ὑπόπουν μὲν ἢ
ἄπουν εἶναι ζῶον ἀνάγκη τὸν ἄνθρωπον, ὑπόπουν
δ' οὐκ ἀνάγκη ἀλλὰ λαμβάνει· τοῦτο δ' ἦν ὃ ἔδει
20 πάλιν δεῖξαι. καὶ τοῦτον δὴ τὸν τρόπον ἀεὶ διαι-
ρουμένοις τὸ μὲν καθόλου συμβαίνει αὐτοῖς μέσον
λαμβάνειν, καθ' οὗ δ' ἔδει δεῖξαι καὶ τὰς διαφορὰς
ἄκρα. τέλος δὲ ὅτι τοῦτ' ἐστὶν ἄνθρωπος ἢ ὃ τι
ποτ' ἂν ᾗ τὸ ζητούμενον οὐδὲν λέγουσι σαφές, ὥστ'
ἀναγκαῖον εἶναι· καὶ γὰρ τὴν ἄλλην ὁδὸν ποιοῦνται
25 πᾶσαν, οὐδὲ τὰς ἐνδεχομένας εὐπορίας ὑπολαμ-
βάνοντες ὑπάρχειν.

the major, not a universal which includes it ; but the process of division requires the contrary procedure, since it takes the universal as the middle term.

For example, let A be ' animal,' B ' mortal,' C ' immortal ' and D ' man,' whose definition it is required to find. Then the exponent of division assumes that every animal is either mortal or immortal, *i.e.*, that everything which is A is either B or C. Next, continuing his process of division, he takes ' man ' to be an animal, *i.e.* he assumes that A is predicated of D. The syllogism, then, is ' Every D will be either B or C,' so that man must necessarily be either mortal or immortal. But that he is a mortal animal is not a necessary inference, but is begged ; and this is the very point which ought to have been proved by syllogism. Again, taking A as ' mortal animal,' B as ' footed,' C as ' footless ' and D as ' man,' he assumes as before that A is included in either B or C (since every mortal animal is either footed or footless) and that A is predicated of D (for he assumed that man is a mortal animal). Hence man must be either a footed or a footless animal. That he is a footed animal, however, is not a necessary inference, but is begged ; and this again is the very point which ought to have been proved by syllogism. Since they invariably divide in this way, it follows that they take the universal term as the middle, and the subject to be defined, together with the differentiae, as the extreme terms. Finally they make no definite statement such as is necessarily valid to the effect that man, or whatever concept they are examining, is so-and-so ; for they follow the other method throughout, without even suspecting that the available facilities for demonstration exist.

46 b

Φανερόν δ' ὅτι οὐτ' ἀνασκευάσαι ταύτη τῇ με-
 θόδῳ ἔστιν, οὔτε περὶ συμβεβηκότος ἢ ἰδίου συλ-
 λογίσασθαι, οὔτε περὶ γένους, οὐτ' ἐν οἷς ἀγνοεῖται
 τὸ πότερον ὡδε ἢ ὡδε ἔχει, οἷον ἀρ' ἡ διάμετρος
 80 ἀσύμμετρος. ἐὰν γὰρ λάβῃ ὅτι ἅπαν μῆκος ἢ σύμ-
 μετρον ἢ ἀσύμμετρον, ἡ δὲ διάμετρος μῆκος, συλλε-
 λόγισται ὅτι ἀσύμμετρος ἢ σύμμετρος ἢ διάμετρος.
 εἰ δὲ λήψεται ἀσύμμετρον, ὃ ἔδει συλλογίσασθαι
 λήψεται. οὐκ ἄρα ἔστι δεῖξαι· ἡ μὲν γὰρ ὁδὸς αὕτη,
 διὰ ταύτης δ' οὐκ ἔστιν. τὸ ἀσύμμετρον ἢ σύμμετρον
 85 ἐφ' οὗ Α, μῆκος Β, διάμετρος Γ.

Φανερόν οὖν ὅτι οὔτε πρὸς πᾶσαν σκέψιν ἀρμόζει
 τῆς ζητήσεως ὁ τρόπος, οὐτ' ἐν οἷς μάλιστα δοκεῖ
 πρέπειν, ἐν τούτοις ἐστὶ χρήσιμος.

Ἐκ τίνων μὲν οὖν αἱ ἀποδείξεις γίνονται καὶ
 πῶς, καὶ εἰς ποῖα βλεπτέον καθ' ἕκαστον πρό-
 40 βλημα, φανερόν ἐκ τῶν εἰρημένων.

XXXII. Πῶς δ' ἀνάγομεν τοὺς συλλογισμοὺς εἰς
 41 τὰ προειρημένα σχήματα, λεκτέον ἂν εἴη μετὰ
 ταῦτα· λοιπὸν γὰρ ἔτι τοῦτο τῆς σκέψεως. εἰ γὰρ
 τήν τε γένεσιν τῶν συλλογισμῶν θεωροῖμεν καὶ τοῦ
 εὐρίσκειν ἔχοιμεν δύναμιν, ἔτι δὲ τοὺς γεγενημένους
 5 ἀναλύοιμεν εἰς τὰ προειρημένα σχήματα, τέλος ἂν
 ἔχοι ἢ ἐξ ἀρχῆς πρόθεσις. συμβήσεται δ' ἅμα καὶ
 τὰ πρότερον εἰρημένα ἐπιβεβαιουῖσθαι καὶ φανε-
 ρώτερα εἶναι ὅτι οὕτως ἔχει διὰ τῶν νῦν λεχ-

* Apparently the word is here used to mean inferential processes in general.

It is evident that by this method it is impossible either (a) to refute a proposition, or to draw an inference (b) about an accident or property, or (c) about a genus, or (d) in cases where a question of fact is uncertain, *e.g.*, whether the diagonal of a square is incommensurable with the sides. For if one assumes that every linear magnitude is either commensurable or incommensurable, and the diagonal is a linear magnitude, the conclusion is that the diagonal is either commensurable or incommensurable; and if one assumes it to be incommensurable, he will be assuming what ought to have been proved by syllogism. Therefore proof is impossible; for this is the method, and by it there is no proof. A stands for 'commensurable or incommensurable,' B for 'linear magnitude,' C for 'diagonal.'

Thus it is evident (1) that this method of inquiry is not adapted for every investigation, and (2) that it is useless even in those cases for which it is supposed to be especially suitable.

Thus it is evident from the foregoing account by what means and in what way demonstrations are effected, and what kind of attributes should be taken into account in each type of problem.

XXXII. We must next explain how to reduce syllogisms ^a to the figures previously described; this part of our inquiry still remains. For if we examine the means by which syllogisms are produced, and possess the ability to invent them, and can also reduce the syllogisms when constructed to the figures previously described, our original undertaking will be completed. Incidentally our previous statements will be further confirmed, and their accuracy will be made more evident, by what is now

Reduction
of argu-
ments to
syllogistic
form.

- 47^a θησομένων· δεῖ γὰρ πᾶν τὸ ἀληθὲς αὐτὸ ἑαυτῷ
ὁμολογούμενον εἶναι πάντη.
- 10 Πρῶτον μὲν οὖν δεῖ πειρᾶσθαι τὰς δύο προτάσεις
ἐκλαμβάνειν τοῦ συλλογισμοῦ (ῥᾶον γὰρ εἰς τὰ
μείζω διελεῖν ἢ τὰ ἐλάττω, μείζω δὲ τὰ συγκείμενα
ἢ ἐξ ὧν), εἴτα σκοπεῖν ποτέρα ἐν ὅλῳ καὶ ποτέρα
ἐν μέρει, καὶ εἰ μὴ ἄμφω εἰλημμέναι εἶεν, αὐτὸν
- 15 τιθέντα τὴν ἐτέραν. ἐνίοτε γὰρ τὴν καθόλου
προτείναντες τὴν ἐν ταύτῃ οὐ λαμβάνουσιν, οὔτε
γράφοντες οὐτ' ἐρωτῶντες· ἢ ταύτας μὲν προ-
τείνουσι, δι' ὧν δ' αὐταὶ περαίνονται παραλεί-
πουσιν, ἄλλα δὲ μάτην ἐρωτῶσι. σκεπτέον οὖν εἰ
τι περίεργον εἰληπται καὶ τι τῶν ἀναγκαῖων παρα-
20 λέλειπται, καὶ τὸ μὲν θετέον τὸ δ' ἀφαιρετέον ἕως
ἂν ἔλθῃ τις εἰς τὰς δύο προτάσεις· ἄνευ γὰρ τούτων
οὐκ ἔστιν ἀναγαγεῖν¹ τοὺς οὕτως ἠρωτημένους
λόγους. ἐνίων μὲν οὖν ῥάδιον ἰδεῖν τὸ ἐνδεές, ἔνιοι
δὲ λανθάνουσι καὶ δοκοῦσι συλλογίζεσθαι διὰ τὸ
ἀναγκαῖόν τι συμβαίνειν ἐκ τῶν κειμένων, ὅλον εἰ
- 25 ληφθείῃ μὴ οὐσίας ἀναιρουμένης μὴ ἀναιρεῖσθαι
οὐσίαν, ἐξ ὧν δ' ἐστὶν ἀναιρουμένων καὶ τὸ ἐκ
τούτων φθείρεσθαι· τούτων γὰρ τεθέντων ἀναγκαῖον
μὲν τὸ οὐσίας μέρος εἶναι οὐσίαν· οὐ μὴν συλλελό-
γισται διὰ τῶν εἰλημμένων, ἀλλ' ἐλλείπουσι προ-
τάσεις. πάλιν εἰ ἀνθρώπου ὄντος ἀνάγκη ζῶον εἶναι

¹ ἀγαγεῖν Adnu.

• In this case the terms.

• Cf. *Topics*, VIII. 1.

to follow ; for every truth must be in all respects self-consistent.

First, then, we must try to select the two premisses of the syllogism (since it is easier to analyse into the greater than into the smaller parts,^a and the composite is greater than its constituents), and then consider which is universal and which particular, supplying the missing premiss ourselves if only one has been assumed ; for both in writing and in argument people sometimes, while stating the universal premiss, fail to mention the premiss contained in it, or they state the immediate premisses, but omit to mention the premisses from which they are inferred, and unnecessarily ask for the concession of others. We must consider, then, whether anything superfluous has been assumed, and whether anything necessary has been left out, and we must posit the latter and reject the former until we arrive at the two premisses ; for without these we cannot reduce arguments which have been suggested in the way described above.^b The inadequacy of some arguments is easily seen, but others escape detection and appear to have a syllogistic force because some necessary conclusion follows from what is laid down : *e.g.*, if it were assumed (*a*) that substance is not destroyed by the destruction of non-substance, and (*b*) that if the constituents of anything are destroyed, that which is composed of them also perishes ; for if we posit these assumptions it necessarily follows that any part of substance is substance, yet it has not been proved syllogistically by means of the assumptions ; the premisses are deficient. Again, if something animate must exist if man exists, and substance must exist if something animate exists,

The premisses must be rightly chosen, fully stated and properly conditioned.

47 a
 20 καὶ ζώου οὐσίαν, ἀνθρώπου ὄντος ἀνάγκη οὐσίαν εἶναι· ἀλλ' οὕτω συλλελόγισται· οὐ γὰρ ἔχουσιν αἱ προτάσεις ὥς εἶπομεν.

Ἀπατώμεθα δ' ἐν τοῖς τοιούτοις διὰ τὸ ἀναγκαῖόν τι συμβαίνειν ἐκ τῶν κειμένων, ὅτι καὶ ὁ συλλογισμὸς ἀναγκαῖόν ἐστιν. ἐπὶ πλέον δὲ τὸ ἀναγκαῖον ἢ ὁ συλλογισμὸς· ὁ μὲν γὰρ συλλογισμὸς
 25 πᾶς ἀναγκαῖον, τὸ δ' ἀναγκαῖον οὐ πᾶν συλλογισμὸς. ὥστ' οὐκ εἴ τι συμβαίνει τεθέντων τινῶν πειρατέον ἀνάγειν εὐθύς, ἀλλὰ πρῶτον ληπτέον τὰς δύο προτάσεις, εἰθ' οὕτω διαιρετέον εἰς τοὺς ὅρους, μέσον δὲ θετέον τῶν ὁρῶν τὸν ἐν ἀμφοτέραις ταῖς προτάσεσι λεγόμενον· ἀνάγκη γὰρ τὸ μέσον ἐν
 40 ἀμφοτέραις ὑπάρχειν ἐν ᾧ αἱ πασι τοῖς σχήμασιν. ἔαν μὲν οὖν κατηγορῇ καὶ κατηγορῇται τὸ μέσον, ἢ αὐτὸ μὲν κατηγορῇ ἄλλο δ' ἐκείνου ἀπαριῇται, τὸ πρῶτον ἔσται σχῆμα· ἔαν δὲ καὶ κατηγορῇ καὶ ἀπαριῇται ἀπὸ τινος, τὸ μέσον· ἔαν δ' ἄλλα ἐκείνου
 47 b κατηγορῇται, ἢ τὸ μὲν ἀπαριῇται τὸ δὲ κατηγορῇται, τὸ ἔσχατον· οὕτω γὰρ εἶχεν ἐν ἐκάστω σχήματι τὸ μέσον. ὁμοίως δὲ καὶ ἔαν μὴ καθόλου ὦσιν αἱ προτάσεις· ὁ γὰρ αὐτὸς διορισμὸς τοῦ μέσου. φανερόν οὖν ὥς ἐν ᾧ λόγῳ μὴ λέγεται ταὐτὸ πλεονάκεις, ὅτι οὐ γίγνεται συλλογισμὸς· οὐ
 10 γὰρ εἴληπται μέσον. ἐπεὶ δ' ἔχομεν ποῖον ἐν ἐκάστω σχήματι περαίνεται τῶν προβλημάτων, καὶ ἐν τίνι τὸ καθόλου καὶ ἐν ποίῳ τὸ ἐν μέρει, φανερόν

• 25 b 35, 26 b 36, 28 a 12.

substance must exist if man exists ; but the argument is not yet a syllogism, because the premisses are not conditioned in the way which we have described.

We are misled in these examples by the fact that something necessarily follows from what has been laid down, because the syllogism is also necessary. But 'necessary' has a wider extension of meaning than 'syllogism,' for every syllogism is necessary, but not everything necessary is a syllogism. Hence if something follows from certain assumptions we must not immediately try to reduce the argument to a syllogism ; we must first grasp the two premisses, and so proceed to analyse them into their terms, and posit as the middle term that which is stated in both premisses ; for in all the figures the middle term must be present in both premisses. Thus if the middle term both is and has a predicate, or is itself a predicate and has something else denied of it, we shall have the first figure ; if it is a predicate and has something else denied of it, we shall have the middle figure ; and if other terms are asserted of it, or if one term is denied and the other asserted of it, we shall have the last figure ; for we have seen^a that the middle term stands in these relations in the several figures. Similarly too if the premisses are not universal ; for the definition of the middle term is the same as before. Thus it is evident that if in any argument the same term is not stated more than once, there is no syllogism, because no middle term has been taken. And since we now comprehend what type of proposition is proved in each figure, *i.e.* in which figure the universal proposition is proved and in which the particular, it is evident that

Not every argument which gives a necessary conclusion is a syllogism.

47 b

ὥς οὐκ εἰς ἅπαντα τὰ σχήματα βλέπτεον, ἀλλ' ἐκάστου προβλήματος εἰς τὸ οἰκεῖον. ὅσα δ' ἐν πλείοσι περαίνεται, τῇ τοῦ μέσου θέσει γνωριούμεν τὸ σχῆμα.

- 15 XXXIII. Πολλάκις μὲν οὖν ἀπατᾶσθαι συμβαίνει περὶ τοὺς συλλογισμούς διὰ τὸ ἀναγκαῖον, ὥσπερ εἴρηται πρότερον, ἐνίοτε δὲ παρὰ τὴν ὁμοιότητα τῆς τῶν ὄρων θέσεως· ὅπερ οὐ χρή λανθάνειν ἡμᾶς. οἶον εἰ τὸ Α κατὰ τοῦ Β λέγεται καὶ τὸ Β κατὰ τοῦ Γ· δόξειε γὰρ ἂν οὕτως ἐχόντων τῶν ὄρων εἶναι
20 συλλογισμός, οὐ γίγνεται δ' οὐτ' ἀναγκαῖον οὐδὲν οὔτε συλλογισμός. ἔστω γὰρ ἐφ' ᾧ Α τὸ ἀεὶ εἶναι, ἐφ' ᾧ δὲ Β διανοητὸς Ἀριστομένης, τὸ δ' ἐφ' ᾧ Γ Ἀριστομένης. ἀληθὲς δὴ τὸ Α τῷ Β ὑπάρχειν· ἀεὶ γάρ ἐστι διανοητὸς Ἀριστομένης. ἀλλὰ καὶ τὸ Β
25 τῷ Γ· ὁ γὰρ Ἀριστομένης ἐστὶ διανοητὸς Ἀριστομένης. τὸ δ' Α τῷ Γ οὐχ ὑπάρχει· φθαρτὸς γάρ ἐστιν ὁ Ἀριστομένης. οὐ γὰρ ἐγένετο συλλογισμός οὕτως ἐχόντων τῶν ὄρων, ἀλλ' ἔδει καθόλου τὴν ΑΒ ληφθῆναι πρότασιν. τοῦτο δὲ ψεῦδος, τὸ ἀξιούν πάντα τὸν διανοητὸν Ἀριστομένην ἀεὶ εἶναι, φθαρτοῦ ὄντος Ἀριστομένου.

- 30 Πάλιν ἔστω τὸ μὲν ἐφ' ᾧ Γ Μίκκαλος, τὸ δ' ἐφ' ᾧ Β μουσικὸς Μίκκαλος, ἐφ' ᾧ δὲ τὸ Α τὸ φθείρεσθαι αὔριον. ἀληθὲς δὴ τὸ Β τοῦ Γ κατηγορεῖν· ὁ γὰρ Μίκκαλός ἐστι μουσικὸς Μίκκαλος· ἀλλὰ καὶ τὸ Α τοῦ Β· φθείροιτο γὰρ ἂν αὔριον μουσικὸς Μίκ-

¹ οὐ γὰρ] οὐκ ἄρα n, Bekker.

* 47 a 31.

* 26 a 30.

* i.e. cease to be cultured. The example is unhappily chosen, since 'cultured Miccalus' is a narrower term than 'Miccalus' unqualified, and therefore cannot properly stand

we should not take all the figures into account at any given time, but only the figure proper to the proposition in question. Where the proposition can be proved in more than one figure, we shall identify the figure by the position of the middle term.

XXXIII. It often happens, then, as we have already said,^a that we are misled in our consideration of syllogisms by the sequence of a necessary conclusion ; but we are also sometimes misled—a fact which must not be overlooked—as the result of a similar arrangement of terms, *e.g.*, if A is predicated of B and B of C. For it would seem that with this relation of terms there is a syllogism, although no necessary consequence or syllogism results. Let A stand for ' always existing,' B for ' Aristomenes as an object of thought ' and C for Aristomenes. Then it is true that A applies to B, because Aristomenes as an object of thought always exists. But B also applies to C ; because Aristomenes is Aristomenes as an object of thought. Yet A does not apply to C ; because Aristomenes is perishable. For no syllogism is produced, as we saw,^b by the above combination of terms ; to produce a syllogism the premiss AB ought to have been taken universally. But it is false to postulate that all Aristomenes as an object of thought always exists, since Aristomenes is perishable.

Again, let C stand for Miccalus, B for ' cultured Miccalus ' and A for ' perishing to-morrow.' Then it is true to predicate B of C, because Miccalus is cultured Miccalus. But it is also true to predicate A of B, for cultured Miccalus may perish to-morrow.^c

as a middle. In the previous example ' Aristomenes as an object of thought,' being a kind of universal, is a legitimate middle.

Some arguments, though not syllogisms, appear at first sight to be so.

47 b

25 καλος· τὸ δέ γε Α τοῦ Γ ψεύδος. τοῦτο δὴ ταῦτόν ἐστι τῷ πρότερον· οὐ γὰρ ἀληθὲς καθόλου Μίκκαλος μουσικὸς ὅτι φθείρεται αὔριον· τούτου δὲ μὴ ληφθέντος οὐκ ἦν συλλογισμός.

Αὕτη μὲν οὖν ἡ ἀπάτη γίνεταί ἐν τῷ παρὰ μικρόν· ὡς γὰρ οὐδὲν διαφέρειν εἰπεῖν τόδε τῷδε
40 ὑπάρχειν ἢ τόδε τῷδε παντὶ ὑπάρχειν συγχωροῦμεν.

48 a XXXIV. Πολλάκις δὲ διαψεύδεσθαι συμπίσειται παρὰ τὸ μὴ καλῶς ἐκτίθεσθαι τοὺς κατὰ τὴν πρότασιν ὅρους, οἷον εἰ τὸ μὲν Α εἴη ὑγίεια, τὸ δ' ἐφ' ᾧ Β νόσος, ἐφ' ᾧ δὲ Γ ἄνθρωπος. ἀληθὲς γὰρ εἰπεῖν ὅτι τὸ Α οὐδενὶ τῷ Β ἐνδέχεται ὑπάρχειν
5 (οὐδεμιᾷ γὰρ νόσῳ ὑγίεια ὑπάρχει), καὶ πάλιν ὅτι τὸ Β παντὶ τῷ Γ ὑπάρχει (πᾶς γὰρ ἄνθρωπος δεκτικὸς νόσου). δόξειεν ἂν οὖν συμβαίνειν μηδενὶ ἀνθρώπῳ ἐνδέχεσθαι ὑγίειαν ὑπάρχειν. τούτου δ' αἴτιον τὸ μὴ καλῶς ἐκκεῖσθαι τοὺς ὅρους κατὰ τὴν
10 λέξιν, ἐπεὶ μεταληφθέντων τῶν κατὰ τὰς ἑξεῖς οὐκ ἔσται συλλογισμός, οἷον ἀντὶ μὲν τῆς ὑγείας εἰ τεθείη τὸ ὑγιαῖνον, ἀντὶ δὲ τῆς νόσου τὸ νοσοῦν. οὐ γὰρ ἀληθὲς εἰπεῖν ὡς οὐκ ἐνδέχεται τῷ νοσοῦντι τὸ ὑγιαίνειν ὑπάρξαι. τούτου δὲ μὴ ληφθέντος οὐ γίνεταί συλλογισμός, εἰ μὴ τοῦ ἐνδέχεσθαι· τοῦτο
15 δ' οὐκ ἀδύνατον· ἐνδέχεται γὰρ μηδενὶ ἀνθρώπῳ ὑπάρχειν ὑγίειαν.

Πάλιν ἐπὶ τοῦ μέσου σχήματος ὁμοίως ἔσται τὸ ψεύδος· τὴν γὰρ ὑγίειαν νόσῳ μὲν οὐδεμιᾷ ἀνθρώπῳ δὲ παντὶ ἐνδέχεται ὑπάρχειν, ὥστ' οὐδενὶ ἀνθρώπῳ

• 26 a 30.

• This should strictly be a problematic premiss.

• The reading νόσον implies an apodeictic conclusion:

But it is false to predicate A of C. Thus the case is the same as before, because it is not universally true of cultured Miccalus that he perishes to-morrow; and unless this is assumed there is, as we saw,^a no syllogism.

This mistake, then, has its origin in a slight distinction; for we assent to the argument as though there were no difference between the statements 'this applies to that' and 'this applies to all of that.'

XXXIV. It will often happen, however, that we are entirely misled through failure to set out the terms properly in the premiss: *e.g.*, supposing that A is 'health,' B 'disease' and C 'man.' For it is true to say that A cannot apply to any B (since health applies to no disease) and again that B applies to all C (since every man is liable to disease).^b Thus it would seem to follow that health cannot apply to any man. The reason of this is that the terms are not properly expressed in the proposition, since if we substitute for the respective states the objects corresponding to them, there will be no syllogism; I mean supposing that 'the healthy' is posited instead of 'health,' and 'the diseased' instead of 'disease.' For it is not true to say that being healthy cannot apply at any time to the diseased; but if this is not assumed, no syllogism results, except of the problematic type. This is not impossible, since health may apply to no man.

Fallacies arise from faulty setting out of terms.

Again, in the middle figure the fallacy will occur in a similar form: health cannot apply to any disease, but may apply to every man; hence disease does not^c

'cannot apply.' This is inconsistent with Aristotle's doctrine in 38 a 13 ff. Either it is a careless mistake, or we should read νόσος.

48 a

νόσον.¹ ἐν δὲ τῷ τρίτῳ σχήματι κατὰ τὸ ἐνδέχεσθαι
 συμβαίνει τὸ ψεῦδος. καὶ γὰρ ὑγίειαν καὶ νόσον,
 20 καὶ ἐπιστήμην καὶ ἄνοιαν, καὶ ὅλως τὰ ἐναντία
 τῷ αὐτῷ ἐνδέχεται ὑπάρχειν, ἀλλήλοις δ' ἀδύνατον.
 τοῦτο δ' ἀνομολογούμενον τοῖς προειρημένοις· ὅτε
 γὰρ τῷ αὐτῷ πλείω ἐνεδέχετο ὑπάρχειν, ἐνεδέχετο
 καὶ ἀλλήλοις.

Φανερόν οὖν ὅτι ἐν ἅπασιν τούτοις ἡ ἀπάτη
 25 γίγνεται παρὰ τὴν τῶν ὁρων ἐκθεσιν· μεταληφ-
 θέντων γὰρ τῶν κατὰ τὰς ἑξεις οὐδὲν γίγνεται
 ψεῦδος. δηλόν οὖν ὅτι κατὰ τὰς τοιαύτας προ-
 τάσεις αἰὲς τὸ κατὰ τὴν ἑξιν ἀντὶ τῆς ἑξews μετα-
 ληπτέον καὶ θετέον ὅρον.

XXXV. Οὐ δεῖ δὲ τοὺς ὅρους αἰὲς ζητεῖν ὀνό-
 30 ματι ἐκτίθεσθαι· πολλάκις γὰρ ἔσονται λόγοι οἷς
 οὐ κεῖται ὄνομα. διὸ χαλεπὸν ἀνάγειν τοὺς
 τοιούτους συλλογισμούς. ἐνίστε δὲ καὶ ἀπατᾶσθαι
 συμβήσεται διὰ τὴν τοιαύτην ζήτησιν, οἷον ὅτι τῶν
 ἀμέσων ἐστὶ συλλογισμός. ἔστω τὸ Α δύο ὀρθαί, τὸ
 ἐφ' ᾧ Β τρίγωνον, ἐφ' ᾧ δὲ Γ ἰσοσκελές. τῷ μὲν
 35 οὖν Γ ὑπάρχει τὸ Α διὰ τὸ Β, τῷ δὲ Β οὐκέτι δι'
 ἄλλο· καθ' αὐτὸ γὰρ τὸ τρίγωνον ἔχει δύο ὀρθάς,
 ὥστ' οὐκ ἔσται μέσον τοῦ ΑΒ ἀποδεικτοῦ ὄντος.
 φανερόν γὰρ ὅτι τὸ μέσον οὐχ οὕτως αἰὲς ληπτέον
 ὥς τότε τι, ἀλλ' ἐνίστε λόγον, ὅπερ συμβαίνει καπὶ
 τοῦ λεχθέντος.

40 XXXVI. Τὸ δὲ ὑπάρχειν τὸ πρῶτον τῷ μέσῳ

¹ an νόσος?

* Cf. 39 a 14-19.

^b i.e. represent them by single words.

apply to any man. In the third figure, however, the fallacy results in respect of possibility ; for health and disease, knowledge and ignorance, and in general any pair of contraries may apply to the same object, but it is impossible that they should apply to one another. But this is inconsistent with what we said above,^a for it was laid down that when several things may apply to the same thing they may apply also to one another.

Thus it is evident that in all these cases the error arises from the setting out of the terms ; for when we substitute for the states the objects corresponding to them, no fallacy results. Thus it is clear that in such premisses as these we must always substitute for a given state the object which is in that state, and posit this as our term.

XXXV. We should not always attempt to set out the terms by name,^b because we shall often have expressions for which there is no accepted name. (Hence it is difficult to reduce syllogisms of this kind.) Sometimes it will happen that we are actually misled as the result of such an attempt ; *e.g.*, so as to suppose that there can be a syllogism of propositions which have no middle term. Let A stand for ' two right angles,' B for ' triangle ' and C for ' isosceles.' Then A applies to C because of B, but it is not because of any other term that A applies to B, for the triangle of itself contains two right angles, so that there will be no middle term of the proposition AB although it is demonstrable. For it is evident that the middle term is not always to be taken as an individual thing, but sometimes as a formula ; as happens in the example just quoted.

Terms cannot always be expressed in a single word.

XXXVI. We must not assume that the first term

48 a

καὶ τοῦτο τῷ ἄκρῳ οὐ δεῖ λαμβάνειν ὥς ἀεὶ κατ-
 48 b ηγορηθησομένων ἀλλήλων ἢ ὁμοίως τό τε πρῶτον
 τοῦ μέσου καὶ τοῦτο τοῦ ἐσχάτου (καὶ ἐπὶ τοῦ
 μὴ ὑπάρχειν δ' ὡσαύτως)· ἀλλ' ὅσαχῶς τὸ εἶναι
 λέγεται καὶ τὸ ἀληθὲς εἰπεῖν αὐτὸ τοῦτο, τοσαυ-
 ταχῶς οἶεσθαι χρὴ σημαίνειν καὶ τὸ ὑπάρχειν. οἶον
 5 ὅτι τῶν ἐναντίων ἐστὶ μία ἐπιστήμη· ἔστω γὰρ τὸ
 Α τὸ μίαν εἶναι ἐπιστήμην, τὰ ἐναντία ἀλλήλοις
 ἐφ' οὗ Β· τὸ δὴ Α τῷ Β ὑπάρχει οὐχ ὥς τὰ ἐναντία
 τὸ μίαν εἶναι αὐτῶν ἐπιστήμην, ἀλλ' ὅτι ἀληθὲς
 εἰπεῖν κατ' αὐτῶν μίαν εἶναι αὐτῶν ἐπιστήμην.

10 Συμβαίνει δ' ὅτε μὲν ἐπὶ τοῦ μέσου τὸ πρῶτον
 λέγεσθαι τὸ δὲ μέσον ἐπὶ τοῦ τρίτου μὴ λέγεσθαι,
 οἶον εἰ ἡ σοφία ἐστὶν ἐπιστήμη, τοῦ δ' ἀγαθοῦ ἐστὶν
 ἡ σοφία [ἐπιστήμη],¹ συμπέρασμα ὅτι τοῦ ἀγαθοῦ
 ἐστὶν ἐπιστήμη· τὸ μὲν δὴ ἀγαθὸν οὐκ ἔστιν ἐπι-
 15 στήμη, ἡ δὲ σοφία ἐστὶν ἐπιστήμη. ὅτε δὲ τὸ μὲν
 μέσον ἐπὶ τοῦ τρίτου λέγεται, τὸ δὲ πρῶτον ἐπὶ
 τοῦ μέσου οὐ λέγεται· οἶον εἰ τοῦ ποιοῦ παντὸς
 ἔστιν ἐπιστήμη ἢ ἐναντίου, τὸ δ' ἀγαθὸν καὶ ἐναν-
 τίων καὶ ποιόν, συμπέρασμα μὲν ὅτι τοῦ ἀγαθοῦ
 ἔστιν ἐπιστήμη, οὐκ ἔστι δὲ τὸ ἀγαθὸν ἐπιστήμη
 οὐδὲ τὸ ποιὸν οὐδὲ τὸ ἐναντίον, ἀλλὰ τὸ ἀγαθὸν
 20 ταῦτα. ἔστι δὲ ὅτε μήτε τὸ πρῶτον κατὰ τοῦ
 μέσου μήτε τοῦτο κατὰ τοῦ τρίτου, τοῦ πρώτου
 κατὰ τοῦ τρίτου ὅτε μὲν λεγομένου ὅτε δὲ μὴ
 λεγομένου· οἶον εἰ οὐ ἐπιστήμη ἔστιν, ἔστι τούτου

¹ om. Bekker.

applies to the middle and the middle to the extreme ^a in the sense that they will always be predicated of one another or that the first term will be predicated of the middle in the same way as the middle is predicated of the last (the same caution applies also to negative predication). We must suppose that the expression 'to apply' has as many different senses as there are senses in which we say that a thing *is*, or that it is true to say that it is. Take, *e.g.*, the statement that there is one science of contraries.^b Let A stand for 'there being one science,' and B for 'things contrary to one another.' Then A applies to B, not in the sense that the contraries *are* 'there being one science' of them, but in the sense that it is true to state of them that there is one science of them.

The terms in the premisses may stand in other cases than the nominative.

It happens sometimes that the first term is stated of the middle, but the middle is not stated of the third term ; *e.g.*, if wisdom is knowledge, and wisdom is concerned with the good, the conclusion is that knowledge is concerned with the good. Then the good is not knowledge, although wisdom is knowledge. Sometimes the middle term is stated of the third, but the first is not stated of the middle ; *e.g.*, if there is a science of every quality or contrary, and good is both a contrary and a quality, the conclusion is that there is a science of the good ; but the good is not science, nor is the quality or the contrary, although the good is a quality and a contrary. Sometimes neither the first term is stated of the middle nor the middle of the third, while the first is sometimes stated of the third and sometimes not. *E.g.*, if there is a genus of

^a *i.e.* minor term.

^b *i.e.* that both members of any given pair of contraries (*e.g.* health and disease) are studied by the same science.

48 b

γένος, τοῦ δ' ἀγαθοῦ ἔστιν ἐπιστήμη, συμπέρασμα
ὅτι τοῦ ἀγαθοῦ ἔστι γένος· κατηγορεῖται δ' οὐδέν
25 κατ' οὐδενός. εἰ δ' οὐ ἔστιν ἐπιστήμη, γένος
ἔστι τοῦτο, τοῦ δ' ἀγαθοῦ ἔστιν ἐπιστήμη, συμπέ-
ρασμα ὅτι τὰγαθὸν ἔστι γένος· κατὰ μὲν δὴ τοῦ
ἄκρου κατηγορεῖται τὸ πρῶτον, κατ' ἀλλήλων δ' οὐ
λέγεται.

Τὸν αὐτὸν δὴ τρόπον καὶ ἐπὶ τοῦ μὴ ὑπάρχειν
ληπτέον. οὐ γὰρ αἰεὶ σημαίνει τὸ μὴ ὑπάρχειν τόδε
30 τῷδε μὴ εἶναι τόδε τόδε, ἀλλ' ἐνίοτε τὸ μὴ εἶναι
τόδε τοῦδε ἢ τόδε τῷδε, οἷον ὅτι οὐκ ἔστι κινήσεως
κίνησις ἢ γενέσεως γένεσις, ἡδονῆς δ' ἔστιν· οὐκ
ἄρα ἢ ἡδονὴ γένεσις· ἢ πάλιν ὅτι γέλωτος μὲν ἔστι
σημεῖον, σημεῖου δὲ οὐκ ἔστι σημεῖον, ὥστ' οὐ
σημεῖον ὁ γέλως. ὁμοίως δὲ καὶ τοῖς ἄλλοις ἐν
35 ὅσοις ἀναιρεῖται τὸ πρόβλημα τῷ λέγεσθαί πως
πρὸς αὐτὸ τὸ γένος. πάλιν ὅτι ὁ καιρὸς οὐκ ἔστι
χρόνος δέων· θεῷ γὰρ καιρὸς μὲν ἔστι, χρόνος δ'
οὐκ ἔστι δέων διὰ τὸ μηδὲν εἶναι θεῷ ὠφέλιμον.
ὄρους μὲν γὰρ θετέον καιρὸν καὶ χρόνον δέοντα καὶ
θεόν, τὴν δὲ πρότασιν ληπτέον κατὰ τὴν τοῦ ὀνό-
40 ματος πτώσιν. ἀπλῶς γὰρ τοῦτο λέγομεν κατὰ
πάντων, ὅτι τοὺς μὲν ὄρους αἰεὶ θετέον κατὰ τὰς
κλήσεις τῶν ὀνομάτων, οἷον ἄνθρωπος ἢ ἀγαθὸν ἢ
45 ἔναντία, οὐκ ἀνθρώπου ἢ ἀγαθοῦ ἢ ἐναντίων, τὰς
δὲ προτάσεις ληπτέον κατὰ τὰς ἐκάστου πτώσεις·
ἢ γὰρ ὅτι τούτῳ, οἷον τὸ ἴσον, ἢ ὅτι τούτου, οἷον
τὸ διπλάσιον, ἢ ὅτι τοῦτο, οἷον τὸ τύπτον ἢ ὀρών,
376

that of which there is a science, and there is a science of the good, the conclusion is that there is a genus of the good ; yet nothing is predicated of anything. But if that of which there is a science is a genus, and if there is a science of the good, the conclusion is that the good is a genus. Thus the first is predicated of the extreme term, but the terms are not predicated of one another in the premisses.

The same must be understood to apply to negative predication ; for ' X does not apply to Y ' does not always mean ' X is not Y ' but sometimes ' there is no X of Y ' or ' for Y.' Take, for instance, the statement ' there is no motion of motion or generation of generation, but there is generation of pleasure ; therefore pleasure is not generation.' Or again ' there is a sign of laughter, but there is no sign of a sign ; hence laughter is not a sign.' Similarly too in all other cases in which the proposition is refuted by stating the genus in a certain relation to the terms of the proposition. Again, there is the argument that opportunity is not the right time ; for opportunity belongs to God, but the right time does not, because nothing is convenient to God. We must posit as terms ' opportunity ' and ' right time ' and ' God,' but the premiss must be understood according to the case of the noun. For we maintain as a general rule which applies without exception to all examples that whereas the terms must always be posited in the nominative case (*e.g.*, ' man ' or ' good ' or ' contraries,' not ' of man ' or ' of good ' or ' of contraries '), the premisses must be understood in accordance with the case of each term: either in the dative, *e.g.*, ' equal to this,' or in the genitive, *e.g.*, ' double of this,' or in the accusative, *e.g.*, ' that which strikes or sees this,' or in the

⁴⁹ ^a ἢ ὅτι οὗτος, οἷον ὁ ἄνθρωπος ζῶον, ἢ εἰ πως ἄλλως πίπτει τοῦνομα κατὰ τὴν πρότασιν.

XXXVII. Τὸ δ' ὑπάρχειν τόδε τῷδε καὶ τὸ ἀληθεύεσθαι τόδε κατὰ τοῦδε τοσαυταχῶς ληπτέον ὅσαχῶς αἱ κατηγορίαι διήρηνται, καὶ ταύτας ἢ πῇ ἢ ἀπλῶς, ἔτι ἀπλᾶς ἢ συμπεπλεγμένας· ὁμοίως δέ
 10 καὶ τὸ μὴ ὑπάρχειν. ἐπισκεπτέον δὲ ταῦτα καὶ διοριστέον βέλτιον.

XXXVIII. Τὸ δ' ἐπαναδιπλούμενον ἐν ταῖς προτάσεσι πρὸς τῷ πρώτῳ ἄκρῳ θετέον, οὐ πρὸς τῷ μέσῳ. λέγω δ' οἷον εἰ γένοιτο συλλογισμὸς ὅτι τῆς δικαιοσύνης ἔστιν ἐπιστήμη ὅτι ἀγαθόν, τὸ ὅτι
 15 ἀγαθὸν ἢ ἢ ἀγαθὸν πρὸς τῷ πρώτῳ θετέον. ἔστω γὰρ τὸ Α ἐπιστήμη ὅτι ἀγαθόν, ἐφ' ᾧ δὲ Β ἀγαθόν, ἐφ' ᾧ δὲ Γ δικαιοσύνη. τὸ δὴ Α ἀληθὲς τοῦ Β κατηγορήσαι, τοῦ γὰρ ἀγαθοῦ ἔστιν ἐπιστήμη ὅτι ἀγαθόν· ἀλλὰ καὶ τὸ Β τοῦ Γ, ἢ γὰρ δικαιοσύνη ὅπερ ἀγαθόν. οὕτω μὲν οὖν γίνεται ἀνάλυσις.
 20 εἰ δὲ πρὸς τῷ Β τεθείη τὸ ὅτι ἀγαθόν, οὐκ ἔσται· τὸ μὲν γὰρ Α κατὰ τοῦ Β ἀληθὲς ἔσται, τὸ δὲ Β κατὰ τοῦ Γ οὐκ ἀληθὲς ἔσται· τὸ γὰρ ἀγαθὸν ὅτι ἀγαθὸν κατηγορεῖν τῆς δικαιοσύνης ψεῦδος καὶ οὐ συνετόν. ὁμοίως δὲ καὶ εἰ τὸ ὑγιεινὸν δειχθείη ὅτι ἔστιν ἐπιστητὸν ἢ ἀγαθόν, ἢ τραγέλαφος¹ ἢ μὴ
 25 ὄν, ἢ ἄνθρωπος φθαρτὸν ἢ αἰσθητόν· ἐν ᾧ πασι γὰρ

¹ τραγέλαφος δοξαστόν Β^d.

* Literally 'goat-deer': a conventional example of fabulous animal. Cf. Plato, *Republic* 488 A, Aristophanes, *Frogs* 937.

^b i.e. it is known not to exist. This seems to be the true

nominative, *e.g.*, ' man is an animal ' ; or in any other way in which the noun occurs in the premiss.

XXXVII. The statements that X applies to Y and that X is true of Y must be understood in as many different senses as there are distinct categories ; and the categories must be taken either in a particular or in an unqualified sense, and further as either simple or compound. Similarly too with negative attribution. These points, however, call for further consideration and more adequate analysis.

XXXVIII. Any term which is duplicated in the premisses should be attached to the first extreme and not to the middle. I mean, *e.g.*, that supposing we should have a syllogism to the effect that ' there is knowledge of probity that it is good,' the expression ' that it is good ' or ' *qua* good ' should be attached to the first term. Let A stand for ' knowledge that it is good,' B for ' good ' and C for ' probity.' Then it is true to predicate A of B, for there is knowledge of good that it is good. But it is also true to predicate B of C ; for probity is identical with one form of good. Thus in this way an analysis can be effected. Supposing, however, that the expression ' that it is good ' be attached to B, there will be no analysis ; for A will be true of B, but B will not be true of C, since to predicate of probity that it is good that it is good is false and unintelligible. Similarly too supposing that it be proved that the healthy is *qua* good an object of knowledge, or that a unicorn ^a is *qua* non-existent an object of knowledge,^b or that a man is *qua* perceptible perishable ; for in all

Various senses of the categories in predication.

Syllogisms with qualified premisses.

meaning. *δοξαστόν*, ' as imaginary,' makes good sense, but it has very little authority, and I have followed Waitz and Jenkinson in rejecting it.

49 a

τοῖς ἐπικατηγορουμένοις πρὸς τῷ ἄκρῳ τὴν ἐπανα-
δίπλωσιν θετέον.

Οὐχ ἡ αὐτὴ δὲ θέσις τῶν ὄρων ὅταν ἀπλῶς τι
συλλογισθῇ καὶ ὅταν τόδε τι ἢ πῇ ἢ πῶς, λέγω δ'
οἷον ὅταν τὰγαθὸν ἐπιστητὸν δειχθῇ καὶ ὅταν
80 ἐπιστητὸν¹ ὅτι ἀγαθόν· ἀλλ' εἰ μὲν ἀπλῶς ἐπι-
στητὸν δέδεικται, μέσον θετέον τὸ ὄν, εἰ δ' ὅτι
ἀγαθόν, τὸ τί ὄν. ἔστω γὰρ τὸ μὲν Α ἐπιστήμη
ὅτι τί ὄν, ἐφ' ᾧ δὲ Β ὄν τι, τὸ δ' ἐφ' ᾧ Γ ἀγαθόν.
ἀληθὲς δὴ τὸ Α τοῦ Β κατηγορεῖν, ἦν γὰρ ἐπιστήμη
τοῦ τινὸς ὄντος ὅτι τί ὄν· ἀλλὰ καὶ τὸ Β τοῦ Γ,
85 τὸ γὰρ ἐφ' ᾧ Γ ὄν τι ὥστε καὶ τὸ Α τοῦ Γ. ἔσται
ἄρα ἐπιστήμη τὰγαθοῦ ὅτι ἀγαθόν· ἦν γὰρ τὸ τί ὄν
τῆς ἰδίου σημείου οὐσίας. εἰ δὲ τὸ ὄν μέσον ἐτέθη
καὶ πρὸς τῷ ἄκρῳ τὸ ὄν ἀπλῶς καὶ μὴ τὸ τί ὄν
ἐλέχθη, οὐκ ἂν ἦν συλλογισμὸς ὅτι ἔστιν ἐπιστήμη
τὰγαθοῦ ὅτι ἀγαθόν, ἀλλ' ὅτι ὄν, οἷον ἐφ' ᾧ τὸ Α
90 ἐπιστήμη ὅτι ὄν, ἐφ' ᾧ Β ὄν, ἐφ' ᾧ Γ ἀγαθόν.
φανερὸν οὖν ὅτι ἐν τοῖς ἐν μέρει συλλογισμοῖς
οὕτως ληπτέον τοὺς ὄρους.

XXXIX. Δεῖ δὲ καὶ μεταλαμβάνειν αὖ τὸ αὐτὸ
δύναται, ὀνόματα ἀντ' ὀνομάτων καὶ λόγους ἀντὶ

¹ ἐπιστητόν τι codd. : om. Boethius, Waitz.

instances of supplementary predication the reduplication must be attached to the extreme ^a term.

The arrangement of terms is not the same when a syllogism is proved without qualification and when the proof relates to a particular thing or sense or condition ; I mean, *e.g.*, when the good is proved to be an object of knowledge and when it is proved to be an object of knowledge that it is good. If it is proved to be the former, we must posit as the middle term 'that which is' ; if to be the latter, with the qualification 'that it is good,' we must posit as the middle 'that which is something.' Let A stand for 'knowledge that it is something,' B for 'that which is something' and C for 'good.' Then it is true to predicate A of B, for *ex hypothesi* there is knowledge of something that it is something. But it is also true to predicate B of C, for that which C represents is something. Hence it is also true to predicate A of C. Therefore there will be knowledge of the good that it is good ; for *ex hypothesi* the expression 'that which is something' refers to the thing's particular form of being. But if we had posited 'that which is' as the middle term, and had connected in a proposition with the extreme term the unqualified expression 'that which is' instead of 'that which is something,' there would have been no syllogism proving that there is knowledge of the good that it is good, but only that it is,—*e.g.*, if A had stood for 'knowledge that it is,' B for 'that which is,' and C for 'good.' Thus it is evident that in syllogisms which are thus particularized the terms must be taken in this way.

XXXIX. We must also substitute equivalents, substituting word for word and phrase for phrase, and

49 b

5 λόγων καὶ ὄνομα καὶ λόγον, καὶ αἰεὶ ἀντὶ τοῦ λόγου τοῦνομα λαμβάνειν· ῥάων γὰρ ἢ τῶν ὄρων ἑκθεσις. οἷον εἰ μὴδὲν διαφέρει εἰπεῖν τὸ ὑποληπτὸν τοῦ δοξαστοῦ μὴ εἶναι γένος ἢ μὴ εἶναι ὅπερ ὑποληπτὸν τι τὸ δοξαστόν (ταῦτόν γὰρ τὸ σημαινόμενον), ἀντὶ τοῦ λόγου τοῦ λεχθέντος τὸ ὑποληπτὸν καὶ τὸ δοξαστόν ὁρους θετέον.

- 10 XL. Ἐπεὶ δ' οὐ ταῦτόν ἐστι τὸ εἶναι τὴν ἡδονὴν ἀγαθὸν καὶ τὸ εἶναι τὴν ἡδονὴν τὸ ἀγαθόν, οὐχ ὁμοίως θετέον τοὺς ὁρους, ἀλλ' εἰ μὲν ἐστὶν ὁ συλλογισμὸς ὅτι ἡ ἡδονὴ τὰγαθόν, τὰγαθόν, εἰ δ' ὅτι ἀγαθόν, ἀγαθόν. οὕτως καπὶ τῶν ἄλλων.

- XLI. Οὐκ ἐστὶ δὲ ταῦτόν οὐτ' εἶναι οὐτ' εἰπεῖν
 15 ὅτι ὥ τὸ B ὑπάρχει, τούτῳ παντὶ τὸ A ὑπάρχει, καὶ τὸ εἰπεῖν τὸ ὥ παντὶ τὸ B ὑπάρχει, καὶ τὸ A παντὶ ὑπάρχει· οὐδὲν γὰρ κωλύει τὸ B τῷ Γ ὑπάρχειν, μὴ παντὶ δέ. οἷον ἔστω τὸ B καλόν τὸ δὲ Γ λευκόν. εἰ δὴ λευκῷ τινι ὑπάρχει καλόν, ἀληθὲς εἰπεῖν ὅτι τῷ λευκῷ ὑπάρχει καλόν· ἀλλ' οὐ
 20 παντὶ ἴσως. εἰ μὲν οὖν τὸ A τῷ B ὑπάρχει, μὴ παντὶ δὲ καθ' οὐ τὸ B, οὐτ' εἰ παντὶ τῷ Γ τὸ B οὐτ' εἰ μόνον ὑπάρχει ἀνάγκη τὸ A, οὐχ ὅτι οὐ παντί, ἀλλ' οὐδ' ὑπάρχειν. εἰ δὲ καθ' οὐ ἂν τὸ B λέγηται ἀληθῶς τούτῳ παντὶ ὑπάρχει, συμβήσεται
 25 τὸ A, καθ' οὐ παντός τὸ B λέγεται, κατὰ τούτου παντός λέγεσθαι. εἰ μέντοι τὸ A λέγεται καθ' οὐ ἂν τὸ B λέγηται κατὰ παντός, οὐδὲν κωλύει τῷ Γ ὑπάρχειν τὸ B, μὴ παντὶ δὲ τὸ A ἢ ὅλως μὴ ὑπάρχειν. ἐν δὴ τοῖς τρισὶν ὁροις δῆλον ὅτι τὸ καθ' οὐ τὸ B, παντός τὸ A λέγεσθαι τοῦτ' ἐστὶ, καθ'

• Sc. indefinitely.

interchanging word and phrase, but always preferring the word to the phrase, for this makes it easier to set out the terms. *E.g.*, if it is immaterial whether we say 'the conceivable is not a genus of the imaginable' or 'the imaginable is not identical with some part of the conceivable' (for the meaning is just the same), we must posit as terms the conceivable and the imaginable in preference to the expression which we have quoted.

Substitution of equivalent expressions for the terms.

XL. Since the propositions 'pleasure is a good' and 'pleasure is the good' are not identical, the terms must not be posited identically in both, but if the syllogism is to prove the latter we must posit 'the good,' and if the former, 'good.' So too in all other cases.

The force of the definite article must not be ignored.

XLI. It is not the same, either in fact or to say, that A applies to all of that to which B applies, and that A applies to all of that to all of which B applies; for there is no reason why B should not apply to C, but not to all C. *E.g.*, let B stand for 'beautiful' and C for 'white.' Then if 'beautiful' applies to some white thing, it is true to say that 'beautiful' applies to 'white,' but not, presumably, to all 'white.' Thus if A applies to B, but not to everything of which B is stated, then whether B applies to all C or merely applies to C, not only need A not apply to all C, but it need not apply to C at all. If on the other hand A applies to all that of which B is truly stated, it will follow that A is stated of everything of all of which B is stated. If, however, A is stated^a of that of all of which B is stated, there is no reason why A should apply to all C or indeed apply to C at all, although B applies to C. With regard to these three terms, then, it is clear that 'A is stated of all of which

Meaning of the proposition 'A is stated of all that of which B is stated.'

49 b

30 ὅσων τὸ Β λέγεται, κατὰ πάντων λέγεσθαι καὶ τὸ Α. καὶ εἰ μὲν κατὰ παντός τὸ Β, καὶ τὸ Α οὕτως· εἰ δὲ μὴ κατὰ παντός, οὐκ ἀνάγκη τὸ Α κατὰ παντός.

Οὐ δεῖ δ' οἶεσθαι παρὰ τὸ ἐκτίθεσθαι τι συμβαίνειν ἄτοπον· οὐδὲν γὰρ προσχρώμεθα τῷ τόδε τι
35 εἶναι, ἀλλ' ὥσπερ ὁ γεωμέτρης τὴν ποδιαίαν καὶ εὐθείαν τήνδε καὶ ἀπλατὴ εἶναι λέγει οὐκ οὔσας,¹ ἀλλ' οὐχ οὕτως χρῆται ὡς ἐκ τούτων συλλογιζόμενος. ὅλως γὰρ ὁ μὴ ἐστὶν ὡς ὅλον πρὸς μέρος καὶ ἄλλο πρὸς τοῦτο ὡς μέρος πρὸς ὅλον, ἐξ οὐδενὸς τῶν τοιούτων δείκνυσιν ὁ δεικνύων, ὥστε
50 οὐδὲ γίνεταί συλλογισμός. τῷ δ' ἐκτίθεσθαι οὕτω χρώμεθα ὥσπερ καὶ τῷ αἰσθάνεσθαι, τὸν μανθάνοντα λέγοντες· οὐ γὰρ οὕτως ὡς ἄνευ τούτων οὐχ οἷόν τ' ἀποδειχθῆναι, ὥσπερ ἐξ ὧν ὁ συλλογισμός.

5 XLII. Μὴ λανθανέτω δ' ἡμᾶς ὅτι ἐν τῷ αὐτῷ συλλογισμῷ οὐχ ἅπαντα τὰ συμπεράσματα δι' ἐνὸς σχήματός εἰσιν, ἀλλὰ τὸ μὲν διὰ τούτου τὸ δὲ δι' ἄλλου. δῆλον οὖν ὅτι καὶ τὰς ἀναλύσεις οὕτω ποιητέον. ἐπεὶ δ' οὐ πᾶν πρόβλημα ἐν ἅπαντι σχήματι ἀλλ' ἐν ἐκάστῳ τεταγμένα, φανερόν ἐκ τοῦ
10 συμπεράσματος ἐν ᾧ σχήματι ζητητέον.

XLIII. Τούς τε πρὸς ὀρισμὸν τῶν λόγων, ὅσοι πρὸς ἐν τι τυγχάνουσι διελεγμένοι τῶν ἐν τῷ ὄρω, πρὸς ὃ διείλεκται θετέον ὅρον, καὶ οὐ τὸν ἅπαντα λόγον· ἥττον γὰρ συμβήσεται ταραττεσθαι διὰ τὸ

¹ οὔσαν B¹df.

B is stated ' means ' A is stated of all things of which B is stated.' And if B is stated of all, so too is A ; but if B is not stated of all, A is not necessarily stated of all.

It must not be supposed that any absurdity results from the setting out of terms. We do not base our argument upon the reality of a particular example ; we are doing the same as the geometrician who says that such-and-such a one-foot line or straight line or line without breadth exists when it does not, yet does not use his illustrations in the sense that he argues from them.^a For in general unless two things are related as whole to part and as part to whole, the man who is trying to prove something can prove nothing from them ; and hence no syllogism results. On the contrary, we (I mean the student) use the setting out of terms as one uses sense-perception ; we do not use them as though demonstration were impossible without these illustrations, as it would be without the premisses of a syllogism.

The setting out of terms is used for illustration, not for demonstration.

XLII. We must not overlook the fact that not all the conclusions in the same syllogism are effected by means of one figure, but some by one and some by another. Thus it is clear that we must conduct our analysis accordingly. And since not every proposition is proved in every figure, but certain fixed types are proved in each, it will be evident from the form of the conclusion in which figure the inquiry should be conducted.

The several conclusions of a single compound syllogism may be proved in different figures.

XLIII. With regard to such arguments as refer to a definition, whenever they are directed to prove some one part of the definition, that part to which the argument is directed, and not the whole formula, should be posited as a term (for so there will be less

Choice of terms in syllogisms used to establish definitions.

50 a

15 μῆκος· οἷον εἰ τὸ ὕδωρ ἔδειξεν ὅτι ὑγρὸν ποτόν, τὸ ποτόν καὶ τὸ ὕδωρ ὅρους θετέον.

XLIV. Ἐπὶ δὲ τοὺς ἐξ ὑποθέσεως συλλογισμοὺς οὐ πειρατέον ἀνάγειν· οὐ γὰρ ἔστιν ἐκ τῶν κειμένων ἀνάγειν. οὐ γὰρ διὰ συλλογισμοῦ δεδειγμένοι εἰσὶν, ἀλλὰ διὰ συνθήκης ὡμολογημένοι πάντες.
20 οἷον εἰ ὑποθέμενος, ἂν δυνάμεις τις μία μὴ ᾗ τῶν ἐναντίων, μῆδ' ἐπιστήμην μίαν εἶναι, εἰτα διαλεχθεῖη ὅτι οὐκ ἔστι πᾶσα¹ δύναμις τῶν ἐναντίων, οἷον τοῦ ὑγιεινοῦ καὶ τοῦ νοσώδους· ἅμα γὰρ ἔσται τὸ αὐτὸ ὑγιεινὸν καὶ νοσῶδες. ὅτι μὲν οὖν οὐκ ἔστι μία πάντων τῶν ἐναντίων δύναμις ἐπιδέ-
30 καίτοι ὁμολογεῖν ἀναγκαῖον· ἀλλ' οὐκ ἐκ συλλογισμοῦ, ἀλλ' ἐξ ὑποθέσεως. τοῦτον μὲν οὖν οὐκ ἔστιν ἀναγαγεῖν, ὅτι δ' οὐ μία δύναμις ἔστιν· οὗτος γὰρ ἴσως καὶ ἦν συλλογισμός, ἐκεῖνο δ' ὑπόθεσις.

Ὅμοίως δὲ καὶ ἐπὶ τῶν διὰ τοῦ ἀδυνάτου πε-
40 ραινομένων· οὐδὲ γὰρ τούτους οὐκ ἔστιν ἀναλύειν, ἀλλὰ τὴν μὲν εἰς τὸ ἀδύνατον ἀπαγωγὴν ἔστι (συλλογισμῷ γὰρ δείκνυται), θάτερον δ' οὐκ ἔστιν· ἐξ ὑποθέσεως γὰρ περαίνεται. διαφέρουσι δὲ τῶν προειρημένων ὅτι ἐν ἐκείνοις μὲν δεῖ προδιομο-
50 λογίσασθαι εἰ μέλλει συμφῆσειν, οἷον ἂν δειχθῇ μία δύναμις τῶν ἐναντίων, καὶ ἐπιστήμην εἶναι τὴν

¹ πᾶσα B¹c¹: πάντων A¹: μία A³B²c².

² ἐπιδέδεικται A¹Bc¹: ἀποδέδεικται A²c²dfm.

likelihood of confusion due to the length of the term): *e.g.*, if it is shown that water is drinkable liquid, the terms posited should be 'drinkable' and 'water.'

XLIV. Further, we should not attempt to reduce hypothetical syllogisms, because it is impossible to reduce them by proceeding from the premisses laid down, since they have not been proved by a syllogism, but have all been admitted by agreement. *E.g.*, suppose that, after assuming that unless there is some one potentiality for contraries there cannot be one science of them, you should then argue that not every potentiality is for contraries, *e.g.*, for the healthy and for the diseased, for if there is, the same thing will be at the same time healthy and diseased : then it has been shown that there is not one potentiality for all contraries, but it has not been shown that there is not one science. It is true that the latter must necessarily be admitted, but only *ex hypothesi* and not as the result of syllogistic proof. The latter argument, then, cannot be reduced, but the argument that there is not one potentiality can ; for presumably this actually was a syllogism, whereas the former was a hypothesis.

Hypothetical syllogisms cannot be reduced.

Similarly too in the case of arguments which are established *per impossibile*. These too cannot be analysed. The reduction *ad impossibile* can be analysed, because it is proved by a syllogism ; but the rest of the argument cannot, because the conclusion is drawn from a hypothesis. These types differ from those described above in that in the former if the conclusion is to be admitted some preliminary argument is necessary, *e.g.*, that if it be shown that there is one potentiality for contraries, the science which studies them is also the same. But in these

50 a

αὐτήν· ἐνταῦθα δὲ καὶ μὴ προδιομολογησάμενοι
 συγχωροῦσι διὰ τὸ φανερόν εἶναι τὸ ψεῦδος, ὅλον
 τεθείσης τῆς διαμέτρου συμμέτρου τὸ τὰ περιττὰ
 ἴσα εἶναι τοῖς ἀρτίοις.

Πολλοὶ δὲ καὶ ἕτεροι περαίνονται ἐξ ὑποθέσεως,
 40 οὓς ἐπισκέψασθαι δεῖ καὶ διασημῆναι καθαρῶς.
 50 b τίνες μὲν οὖν αἱ διαφοραὶ τούτων καὶ ποσαχῶς
 γίγνεται τὸ ἐξ ὑποθέσεως ὕστερον ἐροῦμεν· νῦν δὲ
 τοσοῦτον ἡμῖν ἔστω φανερόν, ὅτι οὐκ ἔστιν ἀναλύειν
 εἰς τὰ σχήματα τοὺς τοιούτους συλλογισμούς· καὶ
 δι' ἣν αἰτίαν, εἰρήκαμεν.

6 XLV. Ὅσα δ' ἐν πλείοσι σχήμασι δείκνυνται τῶν
 προβλημάτων, ἣν ἐν θατέρῳ συλλογισθῇ, ἔστιν
 ἀναγαγεῖν τὸν συλλογισμόν εἰς θάτερον, ὅλον τὸν
 ἐν τῷ πρώτῳ στερητικὸν εἰς τὸ δεύτερον καὶ τὸν
 ἐν τῷ μέσῳ εἰς τὸ πρῶτον, οὐχ ἅπαντας δὲ ἀλλ'
 ἐνίους. ἔσται δὲ φανερόν ἐν τοῖς ἐπομένοις. εἰ γὰρ
 10 τὸ Α μηδενὶ τῷ Β τὸ δὲ Β παντὶ τῷ Γ, τὸ Α
 οὐδενὶ τῷ Γ. οὕτω μὲν οὖν τὸ πρῶτον σχῆμα, εἴαν
 δ' ἀντιστραφῇ τὸ στερητικόν, τὸ μέσον ἔσται· τὸ
 γὰρ Β τῷ μὲν Α οὐδενὶ τῷ δὲ Γ παντὶ ὑπάρχει.
 ὁμοίως δὲ καὶ εἰ μὴ καθόλου ἀλλ' ἐν μέρει ὁ συλ-
 15 λογισμός, ὅλον εἰ τὸ μὲν Α μηδενὶ τῷ Β τὸ δὲ Β
 τινὶ τῷ Γ· ἀντιστραφέντος γὰρ τοῦ στερητικοῦ τὸ
 μέσον ἔσται σχῆμα.

Τῶν δ' ἐν τῷ δευτέρῳ συλλογισμῶν οἱ μὲν
 καθόλου ἀναχθήσονται εἰς τὸ πρῶτον, τῶν δ' ἐν
 μέρει ἄτερος μόνον. ἔστω γὰρ τὸ Α τῷ μὲν Β
 20 μηδενὶ τῷ δὲ Γ παντὶ ὑπάρχον. ἀντιστραφέντος

* Cf. 41 a 26.

† There is no such description to which we can refer.

* Celarent.

* Cesare.

examples the conclusions are admitted even without a preliminary agreement, because the fallacy is obvious ; as for example that if the diagonal of a square is taken to be commensurable, odd numbers are equal to even ones.^a

Many other conclusions also are reached by hypothesis, and these require further study and clear explanation. What their differences are, and in how many ways a hypothetical conclusion is effected, will be described later.^b For the present let us regard this much as evident : that it is impossible to analyse such syllogisms as these into the figures. We have explained why this is so.

XLV. With regard to such propositions as are proved in more than one figure, if a conclusion is drawn in one figure, it is possible to reduce the syllogism to another figure ; *e.g.*, a negative syllogism in the first figure^c can be reduced to the second,^d and in the middle figure—not all, however, but only some of them^e—to the first. The principle will be clearly seen in the following examples. If A applies to no B, and B applies to all C, A applies to no C. In this form we have the first figure. But if the negative proposition is converted, we shall have the middle figure ; for B applies to no A but to all C. Similarly too if the syllogism is not universal but particular, *e.g.*, if A applies to no B and B applies to some C ; on the conversion of the negative proposition we shall have the middle figure.

Of syllogisms in the second figure, those which are universal can be reduced to the first figure, but only one of the two particular syllogisms can be so reduced. Let A be taken as applying to no B but to all C.

^c See next paragraph.

Reduction of syllogism from one figure to another.
(1) First figure into second.

(2) Second figure into first.

60 b

οὖν τοῦ στερητικοῦ τὸ πρῶτον ἔσται σχῆμα· τὸ μὲν γὰρ B οὐδενὶ τῷ A, τὸ δὲ A παντὶ τῷ Γ ὑπάρξει. εἰάν δὲ τὸ κατηγορικὸν ἦ πρὸς τῷ B τὸ δὲ στερητικὸν πρὸς τῷ Γ, πρῶτον ὅρον θετέον τὸ Γ· τοῦτο γὰρ οὐδενὶ τῷ A, τὸ δὲ A παντὶ τῷ B· ὥστ' οὐδενὶ
 25 τῷ B τὸ Γ. οὐδ' ἄρα τὸ B τῷ Γ οὐδενί· ἀντιστρέφει γὰρ τὸ στερητικόν. εἰάν δ' ἐν μέρει ἦ ὁ συλλογισμὸς, ὅταν μὲν ἦ τὸ στερητικὸν πρὸς τῷ μείζονι ἄκρῳ, ἀναχθήσεται εἰς τὸ πρῶτον, ὡς εἰ τὸ A μηδενὶ τῷ B τῷ δὲ Γ τινί· ἀντιστραφέντος γὰρ τοῦ στερητικοῦ τὸ πρῶτον ἔσται σχῆμα· τὸ μὲν γὰρ
 30 B οὐδενὶ τῷ A, τὸ δὲ A τινὶ τῷ Γ. ὅταν δὲ τὸ κατηγορικόν, οὐκ ἀναλυθήσεται, ὡς εἰ τὸ A τῷ μὲν B παντὶ τῷ δὲ Γ οὐ παντί· οὔτε γὰρ δέχεται ἀντιστροφὴν τὸ AB, οὔτε γενομένης ἔσται συλλογισμὸς.

Πάλιν οἱ μὲν ἐν τῷ τρίτῳ σχήματι οὐκ ἀναλυθήσονται πάντες εἰς τὸ πρῶτον, οἱ δ' ἐν τῷ πρώτῳ
 35 πάντες εἰς τὸ τρίτον. ὑπαρχέτω γὰρ τὸ A παντὶ τῷ B, τὸ δὲ B τινὶ τῷ Γ. οὐκοῦν ἐπειδὴ ἀντιστρέφει τὸ ἐν μέρει κατηγορικόν, ὑπάρξει τὸ Γ τινὶ τῷ B· τὸ δὲ A παντὶ ὑπῆρχεν, ὥστε γίγνεται τὸ τρίτον σχῆμα. καὶ εἰ στερητικὸς ὁ συλλογισμὸς ὡσαύτως· ἀντιστρέφει γὰρ τὸ ἐν μέρει κατηγορικόν,
 40 ὥστε τὸ μὲν A οὐδενὶ τῷ B, τὸ δὲ Γ τινὶ ὑπάρξει.
 51 a Τῶν δ' ἐν τῷ τελευταίῳ σχήματι συλλογισμῶν εἰς μόνος οὐκ ἀναλύεται εἰς τὸ πρῶτον, ὅταν μὴ καθόλου τεθῇ τὸ στερητικόν, οἱ δ' ἄλλοι πάντες ἀναλύονται. κατηγορείσθω γὰρ παντὸς τοῦ Γ τὸ A
 5 καὶ τὸ B· οὐκοῦν ἀντιστρέφει τὸ Γ πρὸς ἐκάτερον

Then on the conversion of the negative proposition we shall have the first figure ; for B will apply to no A, but A will apply to all C. But if the affirmative statement is attached to B and the negative to C, C must be posited as first term ; for C applies to no A, and A to all B : hence C applies to no B. Therefore B also applies to no C, for the negative proposition is convertible. If, however, the syllogism is particular, when the negative statement is attached to the major extreme, the syllogism can be reduced to the first figure,—for example, if A applies to no B but to some C ; for on the conversion of the negative proposition we shall have the first figure, since B applies to no A, and A applies to some C. But when the affirmative statement is attached to the major term, the syllogism cannot be analysed : *e.g.*, if A applies to all B but not to all C. For the statement AB does not admit of conversion, nor, even if conversion took place, would there be a syllogism.

Again, syllogisms in the third figure cannot all be resolved into the first, although those in the first can all be resolved into the third. Let A apply to all B, and B apply to some C. Then when the particular affirmative statement is converted, C will apply to some B. But it was assumed that A applies to all B, and so we get the third figure. The same also holds good if the syllogism is negative ; for the particular affirmative statement is convertible, and so A will apply to no B and C to some B.

Of the syllogisms in the last figure only one cannot be resolved into the first figure, viz. when the negative statement is not universal. All the rest can be so resolved. Let A and B be predicated of all C. Then C will convert into a particular relation with each of

(3) First figure into third.

(4) Third figure into first.

61 a

ἐπὶ μέρους· ὑπάρχει ἄρα τινὶ τῷ B. ὥστ' ἔσται
 τὸ πρῶτον σχῆμα, εἰ τὸ μὲν A παντὶ τῷ Γ τὸ
 δὲ Γ τινὶ τῶν B. καὶ εἰ τὸ μὲν A παντὶ τῷ Γ
 τὸ δὲ B τινί, ὁ αὐτὸς λόγος· ἀντιστρέφει γάρ
 πρὸς τὸ Γ τὸ B. ἐὰν δὲ τὸ μὲν B παντὶ τῷ Γ τὸ
 10 δὲ A τινὶ τῷ Γ, πρῶτος ὅρος θετέος τὸ B· τὸ γὰρ
 B παντὶ τῷ Γ τὸ δὲ Γ τινὶ τῷ A, ὥστε τὸ B τινὶ
 τῷ A. ἐπεὶ δ' ἀντιστρέφει τὸ ἐν μέρει, καὶ τὸ
 A τινὶ τῷ B ὑπάρξει.

Καὶ εἰ στερητικὸς ὁ συλλογισμὸς, καθόλου τῶν
 ὄρων ὄντων, ὁμοίως ληπτέον. ὑπαρχέτω γὰρ τὸ B
 παντὶ τῷ Γ, τὸ δὲ A μηδενί· οὐκοῦν τινὶ τῷ B
 15 ὑπάρξει τὸ Γ, τὸ δὲ A οὐδενὶ τῷ Γ, ὥστ' ἔσται
 μέσον τὸ Γ. ὁμοίως δὲ καὶ εἰ τὸ μὲν στερητικὸν
 καθόλου τὸ δὲ κατηγορικὸν ἐν μέρει· τὸ μὲν γὰρ A
 οὐδενὶ τῷ Γ, τὸ δὲ Γ τινὶ τῶν B ὑπάρξει. ἐὰν δ'
 ἐν μέρει ληφθῇ τὸ στερητικόν, οὐκ ἔσται ἀνάλυσις,
 οἷον εἰ τὸ μὲν B παντὶ τῷ Γ τὸ δὲ A τινὶ μὴ
 20 ὑπάρχει· ἀντιστραφέντος γὰρ τοῦ BG ἀμφοτέραι αἱ
 προτάσεις ἔσονται κατὰ μέρος.

Φανερόν δὲ καὶ ὅτι πρὸς τὸ ἀναλύειν εἰς ἄλληλα
 τὰ σχήματα ἢ πρὸς τῷ ἐλάττονι ἄκρῳ πρότασις
 ἀντιστρεπτέα ἐν ἀμφοτέροις τοῖς σχήμασι· ταύτης
 25 γὰρ μετατιθεμένης ἢ μετάβασις ἐγίγνετο.

Τῶν δ' ἐν τῷ μέσῳ σχήματι ἄτερος μὲν ἀνα-
 λύεται ἄτερος δ' οὐκ ἀναλύεται εἰς τὸ τρίτον. ὅταν
 μὲν γὰρ ᾖ τὸ καθόλου στερητικόν, ἀναλύεται· εἰ
 γὰρ τὸ A μηδενὶ τῷ B τῷ δὲ Γ τινί, ἀμφοτέρα
 30 ὁμοίως ἀντιστρέφει πρὸς τὸ A, ὥστε τὸ μὲν B
 οὐδενὶ τῷ A, τὸ δὲ Γ τινί· μέσον ἄρα τὸ A. ὅταν

* Sc. first and third.

these terms. Therefore it applies to some B. Thus we shall have the first figure, if A applies to all C, and C to some B. The same principle holds also if A applies to all C and B to some C; for B is convertible with C. If on the other hand B applies to all C and A to some C, B must be taken as the first term; for B applies to all C, and C to some A, so that B applies to some A; and since the particular statement is convertible, A will also apply to some B.

Also, if the syllogism is negative, provided that the terms are related universally, it should be treated in the same way. Let B apply to all, but A to no C. Then C will apply to some B, and A to no C, so that C will be the middle term. Similarly too if the negative statement is universal and the affirmative particular; for A will apply to no C, and C will apply to some B. If, however, the negative statement is taken as particular, there can be no resolution: *e.g.*, if B applies to all C, and A does not apply to some C; for on the conversion of the premiss BC both the premisses will be particular.

It is also evident that for the purpose of resolving the figures ^a into one another the premiss which is attached to the minor extreme must be converted in both figures; for we have seen that the change from one to another takes place by the substitution of this premiss.

Of the syllogisms in the middle figure, one can be resolved into the third figure and the other cannot. (5) Second figure into third.

(1) When the universal statement is negative, resolution is possible; for if A applies to no B, but to some C, both statements alike are convertible with respect to A, so that B applies to no A and C to some A. Therefore A is the middle term. (2) When A applies

51 a

δέ τὸ Α παντὶ τῷ Β τῷ δὲ Γ τινὶ μὴ ὑπάρχει, οὐκ ἔσται ἀνάλυσις· οὐδετέρα γὰρ τῶν προτάσεων ἐκ τῆς ἀντιστροφῆς καθόλου.

- Καὶ οἱ ἐκ τοῦ τρίτου δὲ σχήματος ἀναλυθήσονται
 85 εἰς τὸ μέσον ὅταν ἢ καθόλου τὸ στερητικόν, ὡς εἰ τὸ Α μηδενὶ τῷ Γ, τὸ δὲ Β τινὶ ἢ παντί· καὶ γὰρ τὸ Γ τῷ μὲν Α οὐδενὶ τῷ δὲ Β τινὶ ὑπάρξει. ἐὰν δ' ἐπὶ μέρους ἢ τὸ στερητικόν οὐκ ἀναλυθήσεται· οὐ γὰρ δέχεται ἀντιστροφήν τὸ ἐν μέρει ἀποφατικόν.
 40 Φανερόν οὖν ὅτι οἱ αὐτοὶ συλλογισμοὶ οὐκ ἀναλύονται ἐν τούτοις τοῖς σχήμασιν οἷπερ οὐδ' εἰς τὸ
 51 b πρῶτον ἀνελύοντο, καὶ ὅτι εἰς τὸ πρῶτον σχῆμα τῶν συλλογισμῶν ἀναγομένων οὗτοι μόνοι διὰ τοῦ ἀδυνάτου περαίνονται.

Πῶς μὲν οὖν δεῖ τοὺς συλλογισμοὺς ἀνάγειν, καὶ ὅτι ἀναλύεται τὰ σχήματα εἰς ἄλληλα, φανερόν ἐκ
 6 τῶν εἰρημένων.

- XLVI. Διαφέρει δέ τι ἐν τῷ κατασκευάζειν ἢ ἀνασκευάζειν τὸ ὑπολαμβάνειν ἢ ταῦτόν ἢ ἕτερον σημαίνειν τὸ μὴ εἶναι τοδὶ καὶ εἶναι μὴ τοῦτο, ὡς τὸ μὴ εἶναι λευκὸν τῷ εἶναι μὴ λευκόν. οὐ γὰρ ταῦτόν σημαίνει, οὐδ' ἔστιν ἀπόφασις τοῦ εἶναι
 10 λευκὸν τὸ εἶναι μὴ λευκόν, ἀλλὰ τὸ μὴ εἶναι λευκόν. λόγος δὲ τούτου ὅδε.

- Ὅμοιως γὰρ ἔχει τὸ δύναται βαδίζειν πρὸς τὸ δύναται οὐ βαδίζειν τῷ ἔστι λευκόν πρὸς τὸ ἔστιν οὐ λευκόν, καὶ ἐπίσταται τὰγαθόν πρὸς τὸ ἐπίσταται τὸ οὐκ ἀγαθόν. τὸ γὰρ ἐπίσταται τὰγαθόν ἢ ἔστιν ἐπιστάμενος τὰγαθόν οὐδὲν διαφέρει, οὐδὲ
 15 τὸ δύναται βαδίζειν ἢ ἔστι δυνάμενος βαδίζειν

to all B, but does not apply to some C, there can be no resolution ; for neither premiss is universal after conversion.

The syllogisms of the third figure can also be resolved into the middle figure when the negative statement is universal, *e.g.*, if A applies to no C and B applies to some or all of C ; for then C will apply to no A but to some B. If, however, the negative statement is particular, resolution will be impossible, for the particular negative does not admit of conversion.

(6) Third figure into second.

Thus it is evident (1) that the types of syllogism which cannot be resolved in these figures are the same as those which we saw could not be resolved into the first figure ; and (2) that when syllogisms are reduced to the first figure these alone are established *per impossibile*.

It is evident, then, from the foregoing account how syllogisms should be reduced ; and also that the figures can be resolved into one another.

XLVI. It makes no little difference in establishing or refuting a proposition whether we suppose that 'not to be so-and-so' and 'to be not-so-and-so' mean the same or something different : *e.g.*, whether 'not to be white' means the same as 'to be not-white.' For it does not mean the same ; the negation of 'to be white' is not 'to be not-white' but 'not to be white.' The explanation of this is as follows :

'X is not Y' does not mean the same as 'X is not-Y.'

'He can walk' is to 'he can not-walk' as 'it is white' is to 'it is not-white,' and as 'he understands the good' is to 'he understands the not-good.' For there is no difference between 'he understands the good' and 'he is understanding of the good,' nor is there between 'he can walk' and 'he is able to walk.'

ὥστε καὶ τὰ ἀντικείμενα, οὐ δύναται βαδίζειν—οὐκ ἔστι δυνάμενος βαδίζειν. εἰ οὖν τὸ οὐκ ἔστι δυνάμενος βαδίζειν ταὐτὸ σημαίνει καὶ ἔστι δυνάμενος οὐ βαδίζειν ἢ μὴ βαδίζειν, ταῦτά γε ἅμα ὑπάρχει ταὐτῷ (ὁ γὰρ αὐτὸς δύναται καὶ βαδίζειν καὶ μὴ βαδίζειν, καὶ ἐπιστήμων τὰγαθοῦ καὶ τοῦ μὴ ἀγαθοῦ ἐστὶ). φάσις δὲ καὶ ἀπόφασις οὐχ ὑπάρχουσιν αἱ ἀντικείμεναι ἅμα τῷ αὐτῷ. ὥσπερ οὖν οὐ ταὐτό ἐστι τὸ μὴ ἐπίστασθαι τὰγαθὸν καὶ ἐπίστασθαι τὸ μὴ ἀγαθόν, οὐδ' εἶναι μὴ ἀγαθὸν καὶ μὴ εἶναι ἀγαθὸν ταυτόν. τῶν γὰρ ἀνὰ λόγον ἐὰν

20 θάτερα ἢ ἕτερα, καὶ θάτερα. οὐδὲ τὸ εἶναι μὴ ἴσον καὶ τὸ μὴ εἶναι ἴσον· τῷ μὲν γὰρ ὑπόκειται τι, τῷ ὄντι μὴ ἴσῳ, καὶ τοῦτ' ἔστι τὸ ἄνισον· τῷ δ' οὐδέν. διόπερ ἴσον μὲν ἢ ἄνισον οὐ πᾶν, ἴσον δ' ἢ οὐκ ἴσον πᾶν.

Ἔτι τὸ ἔστιν οὐ λευκὸν ξύλον καὶ οὐκ ἔστι λευκὸν ξύλον οὐχ ἅμα ὑπάρχει. εἰ γὰρ ἔστι ξύλον οὐ λευκόν, ἔσται ξύλον· τὸ δὲ μὴ ὄν λευκὸν ξύλον οὐκ ἀνάγκη ξύλον εἶναι. ὥστε φανερόν ὅτι οὐκ ἔστι τοῦ ἔστιν ἀγαθόν τὸ ἔστιν οὐκ ἀγαθόν ἀπόφασις. εἰ οὖν κατὰ παντὸς ἐνὸς ἢ φάσις ἢ ἀπόφασις ἀληθής, εἰ μὴ ἔστιν ἀπόφασις, δῆλον ὡς κατάφασις ἂν πῶς εἴη.

25 καταφάσεως δὲ πάσης ἀπόφασίς ἐστι· καὶ ταύτης ἄρα τὸ οὐκ ἔστιν οὐκ ἀγαθόν.

Ἐχει δὲ τάξιν τήνδε πρὸς ἄλληλα. ἔστω τὸ εἶναι ἀγαθὸν ἐφ' οὗ Α, τὸ δὲ μὴ εἶναι ἀγαθὸν ἐφ' οὗ Β, τὸ δὲ εἶναι μὴ ἀγαθὸν ἐφ' οὗ Γ, ὑπὸ τὸ Β, τὸ δὲ μὴ εἶναι μὴ ἀγαθὸν ἐφ' οὗ Δ, ὑπὸ τὸ Α. παντὶ δὴ

Hence the opposite statements, 'he cannot walk,' 'he is not able to walk,' are also identical. If, then, 'he is not able to walk' means the same as 'he is able not to walk,' these attributes will apply at the same time to the same subject (for the same person can both walk and not walk, or is understanding both of the good and of the not-good). But an assertion and its opposite negation do not apply at the same time to the same subject. Therefore just as 'not to understand the good' and 'to understand the not-good' are not the same, so too 'to be not-good' and 'not to be good' are not the same; for if one pair of corresponding terms in an analogical group is different, so is the other. Nor is 'to be not-equal' the same as 'not to be equal'; for the former, 'that which is not equal,' has a definite subject, viz. the unequal; but the latter has none. For this reason everything is either equal or unequal, but not everything is either equal or not equal.

Again, the statements 'the wood is not white' and 'it is not white wood' are not applicable to the same subject; for if wood is not white, it will be wood, but that which is not white wood is not necessarily wood at all. Hence it is evident that 'it is not-good' is not the negation of 'it is good.' If, then, either the assertion or the negation is true of every single thing, if the negation is not true, clearly the affirmation must in some sense be true. But every affirmation has a negation; and therefore the negation of the affirmation in question is 'it is not not-good.'

Now these terms are related to one another as follows. Let A stand for 'to be good,' B for 'not to be good,' C for 'to be not-good' (this falls under B) and D for 'not to be not-good' (this falls under A).

51 b

- 40 ὑπάρξει ἢ τὸ Α ἢ τὸ Β, καὶ οὐδενὶ τῷ αὐτῷ· καὶ ἢ
 τὸ Γ ἢ τὸ Δ, καὶ οὐδενὶ τῷ αὐτῷ. καὶ ὥ τὸ Γ,
 52 ἀνάγκη τὸ Β παντὶ ὑπάρχειν. εἰ γὰρ ἀληθὲς εἰπεῖν
 ὅτι οὐ λευκόν, καὶ ὅτι οὐκ ἔστι λευκόν ἀληθές·
 ἀδύνατον γὰρ ἅμα εἶναι λευκόν καὶ εἶναι μὴ λευκόν,
 ἢ εἶναι ξύλον οὐ λευκόν καὶ εἶναι ξύλον λευκόν· ὥστ'
 εἰ μὴ ἢ κατάφασις, ἢ ἀπόφασις ὑπάρξει. τῷ δὲ
 6 Β τὸ Γ οὐκ αἰεί· ὁ γὰρ ὅλως μὴ ξύλον, οὐδὲ ξύλον
 ἔσται οὐ λευκόν. ἀνάπαλιν τοίνυν, ὥ τὸ Α, τὸ Δ
 παντί. ἢ γὰρ τὸ Γ ἢ τὸ Δ· ἐπεὶ δ' οὐχ οἷόν τε
 ἅμα εἶναι μὴ λευκόν καὶ λευκόν, τὸ Δ ὑπάρξει.
 κατὰ γὰρ τοῦ ὄντος λευκοῦ ἀληθὲς εἰπεῖν ὅτι οὐκ
 ἔστιν οὐ λευκόν. κατὰ δὲ τοῦ Δ οὐ παντός τὸ Α·
 10 κατὰ γὰρ τοῦ ὅλως μὴ ὄντος ξύλου οὐκ ἀληθὲς τὸ Α
 εἰπεῖν, ὥς ἔστι ξύλον¹ λευκόν· ὥστε τὸ Δ ἀληθές, τὸ
 δ' Α οὐκ ἀληθές, ὅτι ξύλον λευκόν. δῆλον δ' ὅτι
 καὶ τὸ ΑΓ οὐδενὶ τῷ αὐτῷ καὶ τὸ Β καὶ τὸ Δ
 ἐνδέχεται τινὶ τῷ αὐτῷ ὑπάρξαι.
 15 Ὅμοίως δ' ἔχουσι καὶ αἱ στερήσεις πρὸς τὰς
 κατηγορίας ταύτη τῇ θέσει. ἴσον ἐφ' οὗ τὸ Α, οὐκ
 ἴσον ἐφ' οὗ τὸ Β, ἄνισον ἐφ' οὗ Γ, οὐκ ἄνισον
 ἐφ' οὗ Δ.

Καὶ ἐπὶ πολλῶν δέ, ὧν τοῖς μὲν ὑπάρχει τοῖς δ'
 οὐχ ὑπάρχει ταυτό, ἢ μὲν ἀπόφασις ὁμοίως ἀληθεύ-
 20 οῖτ' ἄν, ὅτι οὐκ ἔστι λευκὰ πάντα ἢ ὅτι οὐκ ἔστι
 λευκὸν ἕκαστον· ὅτι δ' ἐστὶν οὐ λευκὸν ἕκαστον ἢ
 πάντα ἐστὶν οὐ λευκὰ ψεῦδος. ὁμοίως δὲ καὶ τοῦ
 ἔστι πᾶν ζῶον λευκὸν οὐ τὸ ἔστιν οὐ λευκὸν ἅπαν
 ζῶον ἀπόφασις (ἄμφω γὰρ ψευδεῖς), ἀλλὰ τὸ οὐκ

¹ οὐ post ξύλον add. A : δ' supra lineam B¹ : del. C.

Then either A or B will apply to everything, but they can never both apply to the same subject ; and either C or D will apply to everything, but they can never both apply to the same subject. Also B must apply to everything to which C applies. For if it is true to say ' it is not-white,' it is also true to say ' it is not white ' ; since it is impossible that a thing should at the same time be white and not-white, or that wood should be not-white and white ; so that if the affirmation does not apply, the negation will. But C does not always apply to B ; for that which is not wood at all cannot be white wood either. Conversely then D will apply to everything to which A applies ; for either C or D must apply ; and since it is not possible to be at the same time not-white and white, D will apply ; for it is true to state of that which is white that it is not not-white. But A cannot be stated of all D ; for it is not true to state of that which is not wood at all that it is A, *i.e.*, that it is white wood. Hence D is true, but A, that it is white wood, is not true. It is clear that the combination AC too can never apply to the same subject, whereas both B and D may sometimes apply to the same subject.

The relation of privative to positive terms in this system is similar. A stands for equal, B for not equal, C for unequal, D for not unequal.

Also in the case of plural subjects to some members of which the same attribute applies while to others it does not apply, the negation can be predicated with equal truth : that not all things are white, or that not everything is white ; but that everything is not-white or that all things are not-white is false. Similarly the negation of ' every animal is white ' is not ' every animal is not-white ' (for both statements are

52 a

ἔστι πᾶν ζῶον λευκόν. ἐπεὶ δὲ δῆλον ὅτι ἕτερον
 25 σημαίνει τὸ ἔστιν οὐ λευκόν καὶ οὐκ ἔστι λευκόν,
 καὶ τὸ μὲν κατάφασις τὸ δ' ἀπόφασις, φανερόν ὡς
 οὐχ ὁ αὐτὸς τρόπος τοῦ δεικνύναι ἐκάτερον, οἷον ὅτι
 ὁ ἂν ᾗ ζῶον οὐκ ἔστι λευκόν ἢ ἐνδέχεται μὴ εἶναι
 λευκόν, καὶ ὅτι ἀληθὲς εἰπεῖν μὴ λευκόν· τοῦτο γάρ
 30 ἔστιν εἶναι μὴ λευκόν. ἀλλὰ τὸ μὲν ἀληθὲς εἰπεῖν
 ἔστι λευκόν εἴτε μὴ λευκόν ὁ αὐτὸς τρόπος· κατα-
 σκευαστικῶς γὰρ ἀμφω διὰ τοῦ πρώτου δείκνυται
 σχήματος· τὸ γὰρ ἀληθὲς τῷ ἔστιν ὁμοίως τὰτ-
 τεται· τοῦ γὰρ ἀληθὲς εἰπεῖν λευκόν οὐ τὸ ἀληθὲς
 εἰπεῖν μὴ λευκόν ἀπόφασις, ἀλλὰ τὸ μὴ ἀληθὲς
 35 εἰπεῖν λευκόν. εἰ δὴ ἔσται¹ ἀληθὲς εἰπεῖν ὁ ἂν
 ᾗ ἄνθρωπος μουσικὸν εἶναι ἢ μὴ μουσικὸν εἶναι, ὁ
 ἂν ᾗ ζῶον ληπτέον ἢ εἶναι μουσικὸν ἢ εἶναι μὴ
 μουσικόν, καὶ δέδεικται. τὸ δὲ μὴ εἶναι μουσικόν
 ὁ ἂν ᾗ ἄνθρωπος ἀνασκευαστικῶς δείκνυται κατὰ
 τοὺς εἰρημένους τρόπους τρεῖς.

Ἀπλῶς δ' ὅταν οὕτως ἔχῃ τὸ Α καὶ τὸ Β ὥσθ'
 40 ἅμα μὲν τῷ αὐτῷ μὴ ἐνδέχεσθαι παντὶ δὲ ἐξ ἀνάγ-
 52 b κης θάτερον, καὶ πάλιν τὸ Γ καὶ τὸ Δ ὡσαύτως,
 ἔπεται δὲ τῷ Γ τὸ Α καὶ μὴ ἀντιστρέφῃ, καὶ τῷ
 Β τὸ Δ ἀκολουθήσει καὶ οὐκ ἀντιστρέψει· καὶ τὸ
 μὲν Α καὶ τὸ Δ ἐνδέχεται τῷ αὐτῷ, τὸ δὲ Β καὶ
 Γ οὐκ ἐνδέχεται.

6 Πρῶτον μὲν οὖν ὅτι τῷ Β τὸ Δ ἔπεται² ἐνθένδε
 φανερόν· ἐπεὶ γὰρ παντὶ τῶν ΓΔ θάτερον ἐξ
 ἀνάγκης, ὥ δὲ τὸ Β οὐκ ἐνδέχεται τὸ Γ διὰ τὸ

¹ ἔσται Jenkinson: ἔστιν codd.

² τὸ Δ ἔπεται ABC: ἔπεται τὸ Δ c, Bekker.

* i.e. the uses of the two expressions are parallel.

false) but 'not every animal is white.' And since it is clear that 'it is not-white' and 'it is not white' differ in meaning, and that one is an affirmation and the other a negation, it is evident that the method of proof is not the same in both cases : viz. to prove the statement that whatever is an animal is not white, or may not be white, and the statement that it is true to say that it is not-white ; for this is what 'to be not-white' means. But the same method of proof applies to the statements that it is true to say that it is white, and that it is true to say that it is not-white ; for both are proved constructively by means of the first figure, since 'it is true' ranks with 'it is' ^a ; for the negation of 'it is true to call it white' is not 'it is true to call it not-white' but 'it is not true to call it white.' If, then, it is to be true to say that whatever is a man is either cultured or not cultured, assume that whatever is an animal is either cultured or not cultured, and the proof is accomplished. 'That whatever is a man is not cultured' is proved destructively by the three moods already described.^b

In general when A and B are so related that they cannot apply at the same time to the same subject, yet one or other of them necessarily applies to everything ; and when C and D are similarly related, and A is a consequent of C, and the relation is not reversible : then D will be a consequent of B, and this relation will not be reversible. Also A and D may apply to the same subject, but B and C cannot.

(1) That B is a consequent of D is evident from the following proof. Since one or other of the terms C and D necessarily applies to everything, and C cannot apply to that to which B applies, because C implies

^b Celarent, Cesare and Camestres.

52 b

συνεπιφέρειν τὸ Α, τὸ δὲ Α καὶ Β μὴ ἐνδέχεσθαι
 τῷ αὐτῷ, φανερόν ὅτι τὸ Δ ἀκολουθήσει. πάλιν
 ἐπεὶ τῷ Α τὸ Γ οὐκ ἀντιστρέφει, παντὶ δὲ τὸ Γ
 10 ἢ τὸ Δ, ἐνδέχεται τὸ Α καὶ τὸ Δ τῷ αὐτῷ ὑπάρχειν·
 τὸ δέ γε Β καὶ τὸ Γ οὐκ ἐνδέχεται διὰ τὸ συνακο-
 λουθεῖν τῷ Γ τὸ Α· συμβαίνει γάρ τι ἀδύνατον.
 φανερόν οὖν ὅτι οὐδὲ τῷ Δ τὸ Β ἀντιστρέφει,
 ἐπεὶπερ ἐγχωρεῖ ἅμα τὸ Δ καὶ τὸ Α ὑπάρχειν.

Συμβαίνει δ' ἐνίοτε καὶ ἐν τῇ τοιαύτῃ τάξει τῶν
 15 ὄρων ἀπατάσθαι διὰ τὸ μὴ τὰ ἀντικείμενα λαμβά-
 νειν ὀρθῶς ὡς ἀνάγκη παντὶ θάτερον ὑπάρχειν,
 οἷον εἰ τὸ Α καὶ τὸ Β μὴ ἐνδέχεται ἅμα τῷ αὐτῷ,
 ἀνάγκη δ' ὑπάρχειν, ὥς μὴ θάτερον, θάτερον· καὶ
 πάλιν τὸ Γ καὶ τὸ Δ ὡσαύτως, ὥς δὲ τὸ Γ, παντὶ
 ἔπεται τὸ Α. συμβήσεται γὰρ ὥς τὸ Δ τὸ Β
 20 ὑπάρχειν ἐξ ἀνάγκης, ὅπερ ἐστὶ ψεῦδος. εἰλήφθω
 γὰρ ἀπόφασις τῶν ΑΒ ἢ ἐφ' ὧς Ζ, καὶ πάλιν τῶν
 ΓΔ ἢ ἐφ' ὧς Θ. ἀνάγκη δὴ παντὶ ἢ τὸ Α ἢ τὸ Ζ,
 ἢ γὰρ τὴν φάσιν ἢ τὴν ἀπόφασιν· καὶ πάλιν ἢ τὸ
 Γ ἢ τὸ Θ, φάσις γὰρ καὶ ἀπόφασις· καὶ ὥς τὸ Γ
 25 παντὶ τὸ Α ὑπόκειται· ὥστε ὥς τὸ Ζ παντὶ τὸ Θ.
 πάλιν ἐπεὶ τῶν ΖΒ παντὶ θάτερον καὶ τῶν ΘΔ
 ὡσαύτως, ἀκολουθεῖ δὲ τῷ Ζ τὸ Θ, καὶ τῷ Δ
 ἀκολουθήσει τὸ Β· τοῦτο γὰρ ἴσμεν. εἰ ἄρα τῷ
 Γ τὸ Α, καὶ τῷ Δ τὸ Β. τοῦτο δὲ ψεῦδος· ἀνά-
 παλιν γὰρ ἦν ἐν τοῖς οὕτως ἔχουσιν ἢ ἀκολουθήσεις.
 30 οὐ γὰρ ἴσως ἀνάγκη παντὶ τὸ Α ἢ τὸ Ζ, οὐδὲ τὸ

A, and A and B cannot both apply to the same subject, it is evident that D will be a consequent of B. (2) Since the relation of C to A is not reversible, and either C or D applies to everything, A and D may apply to the same subject. B and C, however, cannot, because since A is implied by C, this gives us an impossible result. Thus it is evident that the relation of B to D is also irreversible, since it is possible for D and A to apply at the same time.

It happens sometimes in this arrangement of terms also that we are misled because we do not rightly select the opposites one or the other of which must apply to everything, *e.g.*, as follows. 'A and B cannot apply at the same time to the same subject; but where one does not apply, the other must. Again, C and D are similarly related; and wherever C applies, A is implied; then it will follow that where D applies B necessarily applies' (which is false). 'Let F be taken as the negation of A and B, and G as that of C and D. Then either A or F must apply to everything, since either the assertion or the negation must so apply. Again, so must either C or G, since they are assertion and negation. Also A applies *ex hypothesi* where C applies. Hence G applies to everything to which F applies. Again, since one or other of the terms F and B applies to everything, and similarly with G and D, and since G is a consequent of F, B will also be a consequent of D; for we know this.^a Then if A is a consequent of C, so also is B of D.' But this is false; for we saw that in terms so constituted the reverse consequential relation obtains. The explanation is that it is presumably not necessary that either A or F should apply to everything, nor

^a Cf. 52 b 4-13.

52 b

Ζ ἢ τὸ Β· οὐ γάρ ἐστιν ἀπόφασις τοῦ Α τὸ Ζ.
 τοῦ γὰρ ἀγαθοῦ τὸ οὐκ ἀγαθὸν ἀπόφασις· οὐ ταὐτὸ
 δ' ἐστὶ τὸ οὐκ ἀγαθὸν τῷ οὔτ' ἀγαθὸν οὔτ' οὐκ
 ἀγαθόν. ὁμοίως δὲ καὶ ἐπὶ τῶν ΓΔ· αἱ γὰρ ἀπο-
 φάσεις αἱ εἰλημμέναι δύο εἰσίν.

that either F or B should do so ; for F is not the negation of A. The negation of the good is the not-good ; and the not-good is not identical with the neither good nor not-good. The same is true of C and D. In both cases two negations have been assumed for one term.

B

52 b 35 I. Ἐν πόσοις μὲν οὖν σχήμασι καὶ διὰ ποίων καὶ
 πόσων προτάσεων καὶ πότε καὶ πῶς γίνεται
 40 συλλογισμός, ἔτι δ' εἰς ποῖα βλεπτέον ἀνασκευάζοντι
 53 α καὶ κατασκευάζοντι, καὶ πῶς δεῖ ζητεῖν περὶ τοῦ
 προκειμένου καθ' ὅποιαν οὖν μέθοδον, ἔτι δὲ διὰ
 ποίας ὁδοῦ ληψόμεθα τὰς περὶ ἑκαστον ἀρχάς, ἤδη
 διεληλύθαμεν.

Ἐπεὶ δ' οἱ μὲν καθόλου τῶν συλλογισμῶν εἰσὶν
 5 οἱ δὲ κατὰ μέρος, οἱ μὲν καθόλου πάντες αἰεὶ πλείω
 συλλογίζονται, τῶν δ' ἐν μέρει οἱ μὲν κατηγορικοὶ
 πλείω, οἱ δ' ἀποφατικοὶ τὸ συμπέρασμα μόνον. αἱ
 μὲν γὰρ ἄλλαι προτάσεις ἀντιστρέφουσιν, ἡ δὲ
 στερητικὴ οὐκ ἀντιστρέφει· τὸ δὲ συμπέρασμα τί
 κατὰ τινός ἐστιν· ὥσθ' οἱ μὲν ἄλλοι συλλογισμοὶ
 10 πλείω συλλογίζονται, οἷον εἰ τὸ A δέδεικται παντὶ
 τῷ B ἢ τινί, καὶ τὸ B τινὶ τῷ A ἀναγκαῖον ὑπάρ-
 χειν· καὶ εἰ μηδενὶ τῷ B τὸ A, οὐδὲ τὸ B οὐδενὶ τῷ
 A (τοῦτο δ' ἕτερον τοῦ ἔμπροσθεν)· εἰ δὲ τινὶ μὴ
 ὑπάρχει, οὐκ ἀνάγκη καὶ τὸ B τινὶ τῷ A μὴ ὑπάρ-
 χειν· ἐνδέχεται γὰρ παντὶ ὑπάρχειν.

* i.e. premisses. Cf. 43 b 36.

• Because the relation of subject and predicate is reversed.

* Cf. 25 a 24.

BOOK II

I. **WE** have now explained in how many figures a syllogism is effected ; also the nature and number of the premisses by which it is effected, and the circumstances and conditions by which it is governed. Further, we have explained what kind of attributes should be considered when one is refuting and when one is establishing a proposition, and how to set about the appointed task in every given method of approach ; and further by what means we are to arrive at the starting-points ^a proper to each case.

Now some syllogisms being universal and some particular, those which are universal always give more than one inference ; but whereas those particular syllogisms which are affirmative give more than one inference, those which are negative give only the conclusion. For all other premisses are convertible, but the particular negative premiss is not ; and the conclusion consists of an attribute predicated of a subject. Thus all other syllogisms give more than one result : *e.g.*, if A has been proved to apply to all or some of B, B must also apply to some A ; and if it has been proved that A applies to no B, then B applies to no A. This is a different conclusion from the former.^b But if A does not apply to some B, it does not follow that B also does not apply to some A ; for it may apply to all.^c

BOOK II.
PROPERTIES
OF SYLLOG-
ISM AND
KINDRED
ARGUMENTS.
Summary of
Book I.
chs. i.-xxvi.,
chs. xxvii.-
xxxI.

Syllogisms
which yield
more than
one con-
clusion.

53 a

- 15 Αὕτη μὲν οὖν κοινὴ πάντων αἰτία, τῶν τε καθόλου καὶ τῶν κατὰ μέρος· ἔστι δὲ περὶ τῶν καθόλου καὶ ἄλλως εἰπεῖν. ὅσα γὰρ ἡ ὑπὸ τὸ μέσον ἡ ὑπὸ τὸ συμπέρασμα ἔστιν, ἀπάντων ἔσται ὁ αὐτὸς συλλογισμὸς, ἔαν τὰ μὲν ἐν τῷ μέσῳ τὰ δ' ἐν τῷ
- 20 συμπεράσματι τεθῇ· οἷον εἰ τὸ AB συμπέρασμα διὰ τοῦ Γ, ὅσα ὑπὸ τὸ Β ἢ τὸ Γ ἐστίν, ἀνάγκη κατὰ πάντων λέγεσθαι τὸ Α· εἰ γὰρ τὸ Δ ἐν ὅλῳ τῷ Β τὸ δὲ Β ἐν τῷ Α, καὶ τὸ Δ ἔσται ἐν τῷ Α. πάλιν εἰ τὸ Ε ἐν ὅλῳ τῷ Γ τὸ δὲ Γ ἐν τῷ Α, καὶ τὸ Ε ἐν τῷ Α ἔσται. ὁμοίως δὲ καὶ εἰ στερητικὸς ὁ
- 25 συλλογισμὸς. ἐπὶ δὲ τοῦ δευτέρου σχήματος τὸ ὑπὸ τὸ συμπέρασμα μόνον ἔσται συλλογίσασθαι· οἷον εἰ τὸ Α τῷ Β μηδενὶ τῷ δὲ Γ παντί, συμπέρασμα ὅτι οὐδενὶ τῷ Γ τὸ Β. εἰ δὴ τὸ Δ ὑπὸ τὸ Γ ἐστὶ, φανερόν ὅτι οὐχ ὑπάρχει αὐτῷ τὸ Β. τοῖς δ' ὑπὸ
- 30 τὸ Α ὅτι οὐχ ὑπάρχει οὐ δῆλον διὰ τοῦ συλλογισμοῦ. καίτοι οὐχ ὑπάρχει τῷ Ε, εἰ ἔστιν ὑπὸ τὸ Α· ἀλλὰ τὸ μὲν τῷ Γ μηδενὶ ὑπάρχειν τὸ Β διὰ τοῦ συλλογισμοῦ δέδεικται, τὸ δὲ τῷ Α μὴ ὑπάρχειν ἀναπόδεικτον εἰληπται, ὥστ' οὐ διὰ τὸν συλλογισμόν συμβαίνει τὸ Β τῷ Ε μὴ ὑπάρχειν.
- 35 Ἐπὶ δὲ τῶν ἐν μέρει τῶν μὲν ὑπὸ τὸ συμπέρασμα οὐκ ἔσται τὸ ἀναγκαῖον (οὐ γὰρ γίγνεται συλλογισμὸς ὅταν αὕτη ληφθῇ ἐν μέρει), τῶν δ' ὑπὸ τὸ μέσον ἔσται πάντων, πλὴν οὐ διὰ τὸν συλλογισμόν, οἷον εἰ τὸ Α παντὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ· τοῦ

* Sc. as middle term.

* Waitz points out *ad loc.* that in Camestres nothing can be inferred about subordinates to the middle term.

PRIOR ANALYTICS, II. 1

This reason, then, is common to all syllogisms, both universal and particular; but with respect to universal syllogisms it is also possible to give a different explanation. The same syllogism will hold good of all terms which are subordinate to the middle term or the conclusion, if these terms are placed respectively in the middle and in the conclusion. *E.g.*, if AB is a conclusion reached by means of C,^a A must be stated of all terms which are subordinate to B or C. For if D is wholly contained in B, and B in A, D will also be contained in A. Again, if E is wholly contained in C, and C in A, E will also be contained in A. Similarly too if the syllogism is negative. In the second figure, however, the inference will only hold good of that which is subordinate to the conclusion. *E.g.*, if A applies to no B but to all C, the conclusion is that B applies to no C. Then if D is subordinate to C, it is evident that B does not apply to D. That it does not apply to terms subordinate to A is not shown by the syllogism, although B does not apply to E if E is subordinate to A. But whereas it has been proved by the syllogism that B applies to no C, that B does not apply to A has been assumed without proof; so that it does not follow by the syllogism that B does not apply to E.^b

As for particular syllogisms, there will be no necessary inference concerning the terms subordinate to the conclusion (since no syllogism results when this premiss^c is taken as particular), but there will be one which holds good of all terms subordinate to the middle, only it will not be reached by the syllogism: *e.g.*, if we assume that A applies to all B, and B to

^a The conclusion of the original syllogism, which now becomes the major.

53 a

μὲν γὰρ ὑπὸ τὸ Γ τεθέντος οὐκ ἔσται συλλογισμός,
 40 τοῦ δ' ὑπὸ τὸ Β ἔσται, ἀλλ' οὐ διὰ τὸν προγεγενη-
 μένον. ὁμοίως δὲ καπὶ τῶν ἄλλων σχημάτων· τοῦ
 53 b μὲν γὰρ ὑπὸ τὸ συμπέρασμα οὐκ ἔσται, θατέρου δ'
 ἔσται, πλὴν οὐ διὰ τὸν συλλογισμόν, ἥ καὶ ἐν τοῖς
 καθόλου ἐξ ἀναποδείκτου τῆς προτάσεως τὰ ὑπὸ τὸ
 μέσον ἐδείκνυτο· ὥστ' ἡ οὐδ' ἐκεῖ ἔσται ἡ καὶ
 ἐπὶ τούτων.

II. Ἐστι μὲν οὖν οὕτως ἔχειν ὥστ' ἀληθεῖς εἶναι
 6 τὰς προτάσεις δι' ὧν ὁ συλλογισμός, ἔστι δ' ὥστε
 ψευδεῖς, ἔστι δ' ὥστε τὴν μὲν ἀληθῆ τὴν δὲ ψευδῇ·
 τὸ δὲ συμπέρασμα ἢ ἀληθές ἢ ψεῦδος ἐξ ἀνάγκης.
 ἐξ ἀληθῶν μὲν οὖν οὐκ ἔστι ψεῦδος συλλογίσασθαι,
 ἐκ ψευδῶν δ' ἔστιν ἀληθές, πλὴν οὐ διότι ἀλλ' ὅτι·
 10 τοῦ γὰρ διότι οὐκ ἔστιν ἐκ ψευδῶν συλλογισμός· δι'
 ἣν δ' αἰτίαν ἐν τοῖς ἐπομένοις λεχθήσεται.

Πρῶτον μὲν οὖν ὅτι ἐξ ἀληθῶν οὐχ οἷόν τε ψεῦδος
 συλλογίσασθαι εἰτεῦθεν δῆλον. εἰ γὰρ τοῦ Α ὄντος
 ἀνάγκη τὸ Β εἶναι, τοῦ Β μὴ ὄντος ἀνάγκη τὸ Α μὴ
 εἶναι. εἰ οὖν ἀληθές ἔστι τὸ Α, ἀνάγκη τὸ Β
 15 ἀληθές εἶναι, ἢ συμβήσεται τὸ αὐτὸ ἅμα εἶναι τε
 καὶ οὐκ εἶναι· τοῦτο δ' ἀδύνατον. μὴ ὅτι δὲ κείται
 τὸ Α εἰς ὅρος ὑποληφθήτω ἐνδέχεσθαι ἐνός τινος
 ὄντος ἐξ ἀνάγκης τι συμβαίνειν· οὐ γὰρ οἷόν τε· τὸ
 μὲν γὰρ συμβαῖνον ἐξ ἀνάγκης τὸ συμπέρασμα

• Except Baroco, Bocardo and Disamis (Waitz on 53 a 34).

• 57 a 40-b 17.

some C ; for there will be no inference concerning that which is subordinate to C, but there will be one with regard to that which is subordinate to B ; not, however, by the syllogism already effected. Similarly too with the other figures.^a There will be no inference concerning that which is subordinate to the conclusion, but there will be one concerning the other subordinate, only not by the syllogism ; just as in the universal syllogisms the terms subordinate to the middle are proved, as we have seen, from a premiss which is undemonstrated. Thus either the principle will not apply in the former case, or it will apply here too.

II. It is possible for the premisses by which the syllogism is effected to be both true, or both false, or one true and the other false. The conclusion, however, is true or false of necessity. Now it is impossible to draw a false conclusion from true premisses, but it is possible to draw a true conclusion from false premisses ; only the conclusion will be true not as regards the reason but as regards the fact. It is not possible to infer the reason from false premisses ; why this is so will be explained later.^b

Firstly, then, that it is not possible to draw a false conclusion from true premisses will be clear from the following argument. If, when A is, B must be, then if B is not, A cannot be. Therefore if A is true, B must be true : otherwise it will follow that the same thing at once is and is not, which is impossible. (It must not be supposed that, because A has been posited as a single term, it is possible for any necessary inference to be drawn from any one assumption, for this is impossible. The necessary inference is the conclusion, and the fewest means by which this can

True and
false pre-
misses.

True
premisses
cannot yield
a false
conclusion.

53 b

ἔστι, δι' ὧν δὲ τοῦτο γίνεται ἐλαχίστων τρεῖς ὅροι
 20 δύο δὲ διαστήματα καὶ προτάσεις. εἰ οὖν ἀληθὲς
 ὧ τὸ Β ὑπάρχει τὸ Α παντὶ ὧ δὲ τὸ Γ τὸ Β, ὧ
 τὸ Γ ἀνάγκη τὸ Α ὑπάρχειν, καὶ οὐχ οἷόν τε τοῦτο
 ψεῦδος εἶναι· ἅμα γὰρ ὑπάρξει ταῦτό καὶ οὐχ
 ὑπάρξει. τὸ οὖν Α ὥσπερ ἐν κεῖται, δύο προτάσεις
 25 συλληφθεῖσαι. ὁμοίως δὲ καὶ ἐπὶ τῶν στερητικῶν
 ἔχει· οὐ γὰρ ἔστιν ἐξ ἀληθῶν δεῖξαι ψεῦδος.

Ἐκ ψευδῶν δ' ἀληθὲς ἔστι συλλογίσασθαι καὶ
 ἀμφοτέρων τῶν προτάσεων ψευδῶν οὓων καὶ τῆς
 μιᾶς, ταύτης δ' οὐχ ὅποτέρας ἔτυχεν ἀλλὰ τῆς
 δευτέρας,¹ ἔάνπερ ὅλην λαμβάνῃ ψευδῇ· μὴ ὅλης δὲ
 30 λαμβανομένης ἔστιν ὅποτερασσοῦν.

Ἐστω γὰρ τὸ Α ὅλῳ τῷ Γ ὑπάρχον τῶν δὲ Β
 μηδενί, μηδὲ τὸ Β τῷ Γ· ἐνδέχεται δὲ τοῦτο, οἷον
 λίθῳ οὐδενὶ ζῶον, οὐδὲ λίθος οὐδενὶ ἀνθρώπῳ· ἐὰν
 οὖν ληφθῇ τὸ Α παντὶ τῷ Β καὶ τὸ Β παντὶ τῷ Γ,
 τὸ Α παντὶ τῷ Γ ὑπάρξει, ὥστ' ἐξ ἀμφοῖν ψευδῶν
 35 ἀληθὲς τὸ συμπέρασμα (πᾶς γὰρ ἄνθρωπος ζῶον).
 ὡσαύτως δὲ καὶ τὸ στερητικόν· ἔστι γὰρ τῷ Γ μήτε
 τὸ Α ὑπάρχειν μηδενί μήτε τὸ Β, τὸ μέντοι Α
 τῷ Β παντί, οἷον ἐὰν τῶν αὐτῶν ὄρων ληφθέντων
 μέσον τεθῇ ὁ ἄνθρωπος· λίθῳ γὰρ οὔτε ζῶον οὔτε
 ἄνθρωπος οὐδενὶ ὑπάρχει, ἀνθρώπῳ δὲ παντὶ ζῶον.
 40 ὥστ' ἐὰν ὧ μὲν ὑπάρχει λάβῃ μηδενὶ ὑπάρχειν, ὧ
 δὲ μὴ ὑπάρχει παντὶ ὑπάρχειν, ἐκ ψευδῶν ἀμφοῖν
 54 a ἀληθὲς ἔσται τὸ συμπέρασμα. ὁμοίως δὲ δειχ-
 θήσεται καὶ ἐὰν ἐπὶ τι ψευδῆς ἐκατέρα ληφθῇ.

¹ ἀλλὰ τῆς δευτέρας om. Bu, Jenkinson.

* i.e. contrary to the true premiss. Cf. 54 a 4.

be effected are three terms and two connecting relations or premisses.) If, then, it is true that A applies to everything to which B does, and that B applies where C does, A must apply where C does, and this cannot be false; otherwise the same attribute will at once apply and not apply. Thus although A is posited as a single term, it represents the conjunction of two premisses. Similarly too with negative syllogisms: it is impossible to prove a false conclusion from true premisses.

It is possible to draw a true conclusion from false premisses not only when both premisses are false but also when only one is false,—not either one indifferently, but the second, that is if it is wholly false ^a in the form in which it is assumed; otherwise the falsity may belong to either premiss.

Let A apply to the whole of C, but to no B; and let B apply to no C. This is possible: *e.g.*, 'animal' applies to no 'stone' and 'stone' applies to no 'man.' If, then, it is assumed that A applies to all B and B to all C, A will apply to all C. Thus the conclusion from premisses which are both false is true; for every man is an animal. Similarly too with the negative syllogism. For it is possible for both A and B to apply to no C, and yet for A to apply to all B; *e.g.*, if the same terms as before are taken, with 'man' as the middle term; for neither 'animal' nor 'man' applies to any stone, but 'animal' applies to every man. Thus if it is assumed that that which applies to all applies to none, and that which does not apply applies to all, although both premisses are false, the conclusion drawn from them will be true. A similar proof will also obtain if both premisses assumed are partly false.

How true conclusions can be drawn from false premisses.

First figure
(1) Universal syllogisms.
(i.) Both premisses false.

Ἐὰν δ' ἡ ἑτέρα τεθῇ ψευδής, τῆς μὲν πρώτης
 ὅλης ψευδοῦς οὔσης, οἷον τῆς AB, οὐκ ἔσται τὸ
 συμπέρασμα ἀληθές, τῆς δὲ BG ἔσται. λέγω δ'
 ὅλην ψευδῇ τὴν ἐναντίαν, οἷον εἰ μηδενὶ ὑπάρχον
 παντὶ εἴληπται ἢ εἰ παντὶ μηδενὶ ὑπάρχειν. ἔστω
 γὰρ τὸ A τῷ B μηδενὶ ὑπάρχον, τὸ δὲ B τῷ Γ
 παντί. ἂν δὴ τὴν μὲν BG πρότασιν λάβω ἀληθῇ
 τὴν δὲ τὸ AB ψευδῇ ὅλην, καὶ παντὶ ὑπάρχειν τῷ
 B τὸ A, ἀδύνατον τὸ συμπέρασμα ἀληθές εἶναι.
 οὐδενὶ γὰρ ὑπῆρχε τῶν Γ, εἴπερ ὥς τὸ B, μηδενὶ τὸ
 A, τὸ δὲ B παντὶ τῷ Γ. ὁμοίως δ' οὐδ' εἰ τὸ A
 τῷ B παντὶ ὑπάρχει καὶ τὸ B τῷ Γ παντί, ἐλήφθη
 δ' ἡ μὲν τὸ BG ἀληθὴς πρότασις ἡ δὲ τὸ AB
 ψευδὴς ὅλη, καὶ μηδενὶ ὥς τὸ B τὸ A, τὸ συμπέρα-
 σμα ψεῦδος ἔσται· παντὶ γὰρ ὑπάρξει τῷ Γ τὸ A,
 εἴπερ ὥς τὸ B, παντὶ τὸ A, τὸ δὲ B παντὶ τῷ Γ.
 φανερόν οὖν ὅτι τῆς πρώτης ὅλης λαμβανομένης
 ψευδοῦς, εἰάν τε καταφατικῆς εἰάν τε στερητικῆς,
 τῆς δ' ἑτέρας ἀληθοῦς, οὐ γίνεταί ἀληθές τὸ
 συμπέρασμα. μὴ ὅλης δὲ λαμβανομένης ψευδοῦς
 ἔσται. εἰ γὰρ τὸ A τῷ μὲν Γ παντὶ ὑπάρχει τῷ δὲ
 B τινί, τὸ δὲ B παντὶ τῷ Γ, οἷον ζῶον κύκνῳ μὲν
 παντὶ λευκῷ δὲ τινί, τὸ δὲ λευκὸν παντὶ κύκνῳ, εἰάν
 ληφθῇ τὸ A παντὶ τῷ B καὶ τὸ B παντὶ τῷ Γ, τὸ
 A παντὶ τῷ Γ ὑπάρξει ἀληθῶς· πᾶς γὰρ κύκνος
 ζῶον. ὁμοίως δὲ καὶ εἰ στερητικὸν εἴη τὸ AB·
 ἐγχαρεῖ γὰρ τὸ A τῷ μὲν B τινὶ ὑπάρχειν τῷ δὲ Γ
 μηδενί, τὸ δὲ B παντὶ τῷ Γ, οἷον ζῶον τινὶ λευκῷ
 χιόνι δ' οὐδεμίᾳ, λευκὸν δὲ πάσῃ χιόνι. εἰ οὖν
 ληφθῇ τὸ μὲν A μηδενὶ τῷ B τὸ δὲ B παντὶ τῷ Γ,
 τὸ A οὐδενὶ τῷ Γ ὑπάρξει. εἰ δ' ἡ μὲν AB πρό-

If, however, only one of the premisses posited is false, when the first, *e.g.*, AB, is wholly false, the conclusion will not be true ; but when BC is wholly false, the conclusion can be true. I mean by ' wholly false ' the contrary statement, *i.e.*, if that which applies to none is assumed to apply to all, or *vice versa*. For let A apply to no B, and B to all C. Then if the premiss BC which I assume is true, and the premiss AB is wholly false, *i.e.*, A applies to all B, the conclusion cannot be true ; for *ex hypothesi* A applies to no C, if A applies to nothing to which B applies, and B applies to all C. Similarly too if A applies to all B and B to all C, and the premiss BC which has been assumed is true, but the premiss AB is assumed in a form which is wholly false (*viz.*, that A applies to nothing to which B applies) : the conclusion will be false ; for A will apply to all C if A applies to everything to which B applies, and B applies to all C. Thus it is evident that when the first premiss assumed, whether affirmative or negative, is wholly false, and the other premiss is true, the conclusion which follows is not true ; but it will be true if the premiss assumed is not wholly false. For if A applies to all C and to some B, and B applies to all C, as *e.g.* ' animal ' applies to every swan and to some ' white,' and ' white ' applies to every swan ; and if it is assumed that A applies to all B and B to all C, A will apply to all C, which is true ; for every swan is an animal. Similarly too supposing that AB is negative ; for it is possible for A to apply to some B but to no C, and for B to apply to all C : as, *e.g.*, ' animal ' applies to some ' white ' but to no snow, but white applies to all snow. Supposing then that A is assumed to apply to no B, and B to all C, A will apply to no C.

(ii.) One premiss false.

Major wholly false, minor true.

Major partly false, minor true.

54 a

τασις ὅλη ληφθῇ ἀληθῆς ἢ δὲ ΒΓ ὅλη ψευδῆς, ἔσται
 80 συλλογισμὸς ἀληθῆς· οὐδὲν γὰρ κωλύει τὸ Α τῷ Β
 καὶ τῷ Γ παντὶ ὑπάρχειν, τὸ μέντοι Β μηδενὶ τῷ Γ,
 ὅλον ὅσα τοῦ αὐτοῦ γένους εἶδη μὴ ὑπ' ἄλληλα· τὸ
 γὰρ ζῶον καὶ ἵππῳ καὶ ἀνθρώπῳ ὑπάρχει, ἵππος δ'
 οὐδενὶ ἀνθρώπῳ. εἰάν οὖν ληφθῇ τὸ Α παντὶ τῷ
 85 Β καὶ τὸ Β παντὶ τῷ Γ, ἀληθὲς ἔσται τὸ συμπέρα-
 σμα ψευδοῦς ὅλης οὔσης τῆς ΒΓ προτάσεως.

Ὅμοίως δὲ καὶ στερητικῆς οὔσης τῆς ΑΒ προ-
 τάσεως. ἐνδέχεται γὰρ τὸ Α μήτε τῷ Β μήτε τῷ
 Γ μηδενὶ ὑπάρχειν, μηδὲ τὸ Β μηδενὶ τῷ Γ, ὅλον
 τοῖς ἐξ ἄλλου γένους εἶδεσι τὸ γένος· τὸ γὰρ ζῶον
 64 b οὔτε μουσικῇ οὔτ' ἱατρικῇ ὑπάρχει, οὐδ' ἡ μουσικῇ
 ἱατρικῇ. ληφθέντος οὖν τοῦ μέν Α μηδενὶ τῷ Β
 τοῦ δὲ Β παντὶ τῷ Γ, ἀληθὲς ἔσται τὸ συμπέρασμα.

Καὶ εἰ μὴ ὅλη ψευδῆς ἢ ΒΓ ἀλλ' ἐπὶ τι, καὶ οὕτως
 ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει
 5 τὸ Α καὶ τῷ Β καὶ τῷ Γ ὅλῳ ὑπάρχειν, τὸ μέντοι
 Β τινὶ τῷ Γ, ὅλον τὸ γένος τῷ εἶδει καὶ τῇ διαφορᾷ·
 τὸ γὰρ ζῶον παντὶ ἀνθρώπῳ καὶ παντὶ πεζῷ, ὃ δ'
 ἄνθρωπος τινὶ πεζῷ καὶ οὐ παντί. εἰ οὖν τὸ Α
 παντὶ τῷ Β καὶ τὸ Β παντὶ τῷ Γ ληφθείη, τὸ Α
 παντὶ τῷ Γ ὑπάρξει· ὅπερ ἦν ἀληθές.

10 Ὅμοίως δὲ καὶ στερητικῆς οὔσης τῆς ΑΒ προ-
 τάσεως. ἐνδέχεται γὰρ τὸ Α μήτε τῷ Β μήτε
 τῷ Γ μηδενὶ ὑπάρχειν, τὸ μέντοι Β τινὶ τῷ Γ, ὅλον
 τὸ γένος τῷ ἐξ ἄλλου γένους εἶδει καὶ διαφορᾷ· τὸ
 γὰρ ζῶον οὔτε φρονήσει οὐδεμιᾷ ὑπάρχει οὔτε

But if the premiss AB which is assumed is wholly true, and BC is wholly false, we shall have a true conclusion. For there is no reason why A should not apply to all B and all C, while B applies to no C ; as is the case with all species of a genus which are not subordinate one to another ; for ' animal ' applies to both horse and man, but ' horse ' applies to no man. Thus if A is assumed to apply to all B, and B to all C, the conclusion will be true, although the premiss BC is wholly false.

Major true,
minor
wholly
false.

Similarly too when the premiss AB is negative. For it is possible that A should apply to no B and to no C, and that B should apply to no C ; as, *e.g.*, a For ' animal ' applies neither to music nor to medicine, nor does music apply to medicine. If, then, it is assumed that A applies to no B but B applies to all C, the conclusion will be true.

Also if the premiss BC is not wholly but only partly false, the conclusion will again be true. For there is no reason why A should not apply to the whole of both B and C, while B applies to some C ; as, *e.g.*, the genus applies both to the species and to the differentia ; for ' animal ' applies to every man and to everything that walks on land, while ' man ' applies to some things which walk on land, but not to all. Supposing, then, that A is assumed to apply to all B, and B to all C, A will apply to all C ; which, as we have seen, is true.

Major true,
minor partly
false.

Similarly too if the premiss AB is negative. For it is possible for A to apply to no B and to no C, and yet for B to apply to some C ; as, *e.g.*, the genus does not apply to the species and differentia of another genus ; for ' animal ' applies neither to ' thought '

64 b

θεωρητικῇ, ἡ δὲ φρόνησις τινὶ θεωρητικῇ. εἰ οὖν
 15 ληφθεῖη τὸ μὲν Α μηδενὶ τῷ Β τὸ δὲ Β παντὶ τῷ
 Γ, οὐδενὶ τῷ Γ τὸ Α ὑπάρξει· τοῦτο δ' ἦν ἀληθές.

Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν ἐνδέχεται καὶ
 τῆς πρώτης προτάσεως ὅλης οὔσης ψευδοῦς τῆς δ'
 20 ἐτέρας ἀληθοῦς ἀληθὲς εἶναι τὸ συμπέρασμα, καὶ
 ἐπὶ τι ψευδοῦς οὔσης τῆς πρώτης τῆς δ' ἐτέρας
 ἀληθοῦς,¹ καὶ τῆς μὲν ἀληθοῦς τῆς δ' ἐν μέρει
 ψευδοῦς, καὶ ἀμφοτέρων ψευδῶν. οὐδὲν γὰρ κω-
 λύει τὸ Α τῷ μὲν Β μηδενὶ ὑπάρχειν τῷ δὲ Γ τινί,
 καὶ τὸ Β τῷ Γ τινί, ὅλον ζῶον οὐδεμιᾷ χιῶν λευκῷ
 δὲ τινὶ ὑπάρχει, καὶ ἡ χιῶν λευκῷ τινί. εἰ οὖν²
 25 μέσον τεθεῖη ἡ χιῶν πρῶτον δὲ τὸ ζῶον, καὶ
 ληφθεῖη τὸ μὲν Α ὅλῳ τῷ Β ὑπάρχειν τὸ δὲ Β τινὶ
 τῷ Γ, ἡ μὲν ΑΒ ὅλη ψευδής, ἡ δὲ ΒΓ ἀληθής, καὶ
 τὸ συμπέρασμα ἀληθές. ὁμοίως δὲ καὶ στερητικῆς
 οὔσης τῆς ΑΒ προτάσεως· ἐγχωρεῖ γὰρ τὸ Α τῷ
 μὲν Β ὅλῳ ὑπάρχειν τῷ δὲ Γ τινὶ μὴ ὑπάρχειν, τὸ
 30 μέντοι Β τινὶ τῷ Γ ὑπάρχειν, ὅλον τὸ ζῶον ἀνθρώπῳ
 μὲν παιτὶ ὑπάρχει λευκῷ δὲ τινὶ οὐχ ἔπεται, ὁ δ'
 ἀνθρώπος τινὶ λευκῷ ὑπάρχει· ὥστ' εἰ μέσου
 τεθέντος τοῦ ἀνθρώπου ληφθεῖη τὸ Α μηδενὶ τῷ Β
 ὑπάρχειν τὸ δὲ Β τινὶ τῷ Γ ὑπάρχειν, ἀληθὲς ἔσται
 35 τὸ συμπέρασμα ψευδοῦς οὔσης ὅλης τῆς ΑΒ προ-
 τάσεως.

Καὶ εἰ ἐπὶ τι ψευδὴς ἡ ΑΒ πρότασις, ἔσται τὸ
 συμπέρασμα ἀληθές· οὐδὲν γὰρ κωλύει τὸ Α καὶ
 τῷ Β καὶ τῷ Γ τινὶ ὑπάρχειν, καὶ τὸ Β τῷ Γ τινὶ
 ὑπάρχειν, ὅλον τὸ ζῶον τινὶ καλῷ καὶ τινὶ μεγάλῳ,
 καὶ τὸ καλὸν τινὶ μεγάλῳ ὑπάρχειν. ἐὰν οὖν ληφθῇ

¹ ἀληθοῦς] ὅλης ἀληθοῦς nf, Bekker.

² οἶν] οὐ errore preli Bekker.

nor to 'speculative,' whereas 'thought' applies to some of that which is speculative. Supposing, then, that A is assumed to apply to no B, and B to all C, A will apply to no C; and this, as we have seen, is true.

In the case of particular syllogisms it is possible (2) Particular syllogisms. for the conclusion to be true both (i.) when the first premiss is wholly false and the other is true; and (ii.) when the first premiss is partly false and the other is true; and (iii.) when the former is true and the latter partly false; and (iv.) when both are false. For (i.) there is no reason why A should not apply to no B but to some C, while B applies to some C, as, *e.g.*, 'animal' applies to no snow but to some 'white,' and 'snow' applies to some 'white.' Supposing, then, that 'snow' is posited as the middle term, and 'animal' as the first, and it is assumed that A applies to the whole of B and B to some C, AB is wholly false, but BC is true, and the conclusion is true. Similarly too when the premiss AB is negative. For it is possible for A to apply to the whole of B and not to apply to some C, and yet for B to apply to some C, as, *e.g.*, 'animal' applies to every man, but is not a consequent of some 'white,' and 'man' applies to some 'white'; so that if 'man' is posited as the middle term, and it is assumed that A applies to no B and B applies to some C, the conclusion will be true although the premiss AB is wholly false. Major wholly false, minor true.

(ii.) Also, if the premiss AB is partly false, the conclusion can be true. For there is no reason why A should not apply both to some B and to some C, while B applies to some C; as, *e.g.*, 'animal' applies to some 'beautiful' and some 'large,' and 'beautiful' applies to some 'large.' Thus if A is assumed Major partly false, minor true.

- 55 ¹ τὸ Α παντὶ τῷ Β καὶ τὸ Β τινὶ τῷ Γ, ἡ μὲν ΑΒ πρότασις ἐπὶ τι ψευδὴς ἔσται, ἡ δὲ ΒΓ ἀληθὴς, καὶ τὸ συμπέρασμα ἀληθές. ὁμοίως δὲ καὶ στερητικῆς οὐσης τῆς ΑΒ προτάσεως· οἱ γὰρ αὐτοὶ ὅροι ἔσονται καὶ ὡσαύτως κείμενοι πρὸς τὴν ἀπόδειξιν.
- 8 Πάλιν εἰ ἡ μὲν ΑΒ ἀληθὴς ἡ δὲ ΒΓ ψευδὴς, ἀληθές ἔσται τὸ συμπέρασμα. οὐδὲν γὰρ κωλύει τὸ Α τῷ μὲν Β ὅλῳ ὑπάρχειν τῷ δὲ Γ τινί, καὶ τὸ Β τῷ Γ μηδενὶ ὑπάρχειν, ὅλον ζῶον κύκνῳ μὲν παντὶ μέλανι δὲ τινί, κύκνος δὲ οὐδενὶ μέλανι· ὥστ' εἰ ληφθεῖη παντὶ τῷ Β τὸ Α καὶ τὸ Β τινὶ τῷ Γ, ἀληθές ἔσται τὸ συμπέρασμα ψευδοῦς ὄντος τοῦ ΒΓ.

Ὅμοίως δὲ καὶ στερητικῆς λαμβανομένης τῆς ΑΒ προτάσεως. ἐγχωρεῖ γὰρ τὸ Α τῷ μὲν Β μηδενὶ τῷ δὲ Γ τινὶ μὴ ὑπάρχειν, τὸ μέντοι Β μηδενὶ τῷ Γ, ὅλον τὸ γένος τῷ ἐξ ἄλλου γένους εἶδει καὶ τῷ συμβεβηκότι τοῖς αὐτοῦ εἶδεσι· τὸ γὰρ ζῶον ἀριθμῷ μὲν οὐδενὶ ὑπάρχει λευκῷ δὲ τινὶ οὐ,¹ ὁ δ' ἀριθμὸς οὐδενὶ λευκῷ· ἐὰν οὖν μέσον τεθῇ ὁ ἀριθμὸς, καὶ ληφθῇ τὸ μὲν Α μηδενὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ, τὸ Α τινὶ τῷ Γ οὐχ ὑπάρξει, ὅπερ ἦν ἀληθές· καὶ ἡ μὲν ΑΒ πρότασις ἀληθὴς, ἡ δὲ ΒΓ ψευδὴς.

- 20 Καὶ εἰ ἐπὶ τι ψευδὴς ἡ ΑΒ ψευδὴς δὲ καὶ ἡ ΒΓ ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει τὸ Α τῷ Β τινὶ καὶ τῷ Γ τινὶ ὑπάρχειν ἑκατέρῳ, τὸ δὲ Β μηδενὶ τῷ Γ, ὅλον εἰ ἐναντίον τὸ Β τῷ Γ, ἄμφω δὲ συμβεβηκότα τῷ αὐτῷ γένει· τὸ γὰρ ζῶον τινὶ λευκῷ καὶ τινὶ μέλανι ὑπάρχει, λευκὸν δ' οὐδενὶ μέλανι. ἐὰν οὖν ληφθῇ τὸ Α παντὶ τῷ Β καὶ τὸ Β τινὶ τῷ Γ, ἀληθές ἔσται τὸ συμπέρασμα. καὶ στερητικῆς δὲ λαμβανομένης τῆς ΑΒ ὡσαύτως· οἱ

¹ τινὶ οὐ Philoponus (?), Jenkinson: τινὶ codd.

to apply to all B and B to some C, the premiss AB will be partly false, but BC will be true, and the conclusion will be true. Similarly too if the premiss AB is negative ; the terms will be the same and will be related in the same way for the purpose of the proof.

(iii.) Again, if AB is true and BC false, the conclusion can be true. For there is no reason why A should not apply to the whole of B and to some C, while B applies to no C ; as, *e.g.*, 'animal' applies to every swan and to some 'black,' and 'swan' applies to no 'black' ; so that supposing that A is assumed to apply to all B and B to some C, the conclusion will be true although BC is false.

Major true,
minor false.

Similarly too if the premiss AB is negative. For it is possible for A to apply to no B and not to apply to some C, while B applies to no C ; as, *e.g.*, a genus does not apply to a species from another genus, and does not apply to some of an accident to its own species ; for 'animal' applies to no 'number' and does not apply to some 'white,' and 'number' applies to no 'white.' Thus if 'number' is taken as the middle term, and A is assumed to apply to no B, and B to some C, A will not apply to some C ; which, as we have seen, is true. The premiss AB is true, and BC is false.

(iv.) The conclusion can also be true if AB is partly false and BC is also false. For there is no reason why A should not apply to some of both B and C, while B applies to no C ; *e.g.*, if B is contrary to C, and both are accidents of the same genus ; for 'animal' applies to some 'white' and some 'black,' but 'white' applies to no 'black.' Thus if A is assumed to apply to all B, and B to some C, the conclusion will be true. So too if the premiss AB is

Both
premises
false.

55 a

γὰρ αὐτοὶ ὅροι καὶ ὡσαύτως τεθήσονται πρὸς τὴν ἀπόδειξιν.

Καὶ ἀμφοτέρων δὲ ψευδῶν οὐσῶν ἔσται τὸ
 30 συμπέρασμα ἀληθές· ἐγχωρεῖ γὰρ τὸ Α τῷ μὲν Β
 μηδενὶ τῷ δὲ Γ τινὶ ὑπάρχειν, τὸ μέντοι Β μηδενὶ
 τῷ Γ, ὅλον τὸ γένος τῷ ἐξ ἄλλου γένους εἶδει καὶ
 τῷ συμβεβηκότι τοῖς εἶδεσι τοῖς αὐτοῦ· ζῶον γὰρ
 ἀριθμῷ μὲν οὐδενὶ λευκῷ δὲ τινὶ ὑπάρχει, καὶ ὁ
 ἀριθμὸς οὐδενὶ λευκῷ. ἔαν οὖν ληφθῇ τὸ Α παντὶ
 35 τῷ Β καὶ τὸ Β τινὶ τῷ Γ, τὸ μὲν συμπέρασμα
 ἀληθές, αἱ δὲ προτάσεις ἄμφω ψευδεῖς.

Ὅμοίως δὲ καὶ στερητικῆς οὔσης τῆς ΑΒ. οὐδὲν
 γὰρ κωλύει τὸ Α τῷ μὲν Β ὅλῳ ὑπάρχειν τῷ δὲ Γ
 τινὶ μὴ ὑπάρχειν, μηδὲ τὸ Β μηδενὶ τῷ Γ, ὅλον
 ζῶον κύκνῳ μὲν παντὶ μέλανι δὲ τινὶ οὐχ ὑπάρχει,
 40 κύκνιος δ' οὐδενὶ μέλανι· ὥστ' εἰ ληφθεῖν τὸ Α
 55 b μηδενὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ, τὸ Α τινὶ τῷ Γ οὐχ
 ὑπάρχει. τὸ μὲν οὖν συμπέρασμα ἀληθές, αἱ δὲ
 προτάσεις ψευδεῖς.

III. Ἐν δὲ τῷ μέσῳ σχήματι πάντως ἐγχωρεῖ
 διὰ ψευδῶν ἀληθὲς συλλογίσασθαι, καὶ ἀμφοτέρων
 5 τῶν προτάσεων ὅλων ψευδῶν λαμβανομένων [καὶ
 ἐπὶ τι ἐκατέρας],¹ καὶ τῆς μὲν ἀληθοῦς τῆς δὲ
 ψευδοῦς οὔσης ὅλης, ὅποτερασοῦν ψευδοῦς τιθε-
 μένης, καὶ εἰ ἀμφότεραι ἐπὶ τι ψευδεῖς, καὶ εἰ ἡ
 μὲν ἀπλῶς ἀληθὴς ἢ δ' ἐπὶ τι ψευδὴς, καὶ εἰ ἡ μὲν
 ὅλη ψευδὴς ἢ δ' ἐπὶ τι ἀληθὴς, καὶ ἐν τοῖς καθόλου
 10 καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν.

Εἰ γὰρ τὸ Α τῷ μὲν Β μηδενὶ ὑπάρχει τῷ δὲ Γ

¹ καὶ . . . ἐκατέρας omittenda ci. Jenkinson.

taken as negative ; the terms will be the same and will be posited in the same relation for the purpose of the proof.

The conclusion can also be true when both premisses are false. For it is possible for A to apply to no B but to some C, while B applies to no C ; as, *e.g.*, a genus does not apply to a species from another genus, but applies to an accident of its own species ; for 'animal' applies to no 'number' but to some 'white,' and 'number' applies to no 'white.' Thus if A is assumed to apply to all B and B to some C, the conclusion will be true although both premisses are false.

Similarly too if AB is negative ; for there is no reason why A should not apply to the whole of B and yet not apply to some C, while B applies to no C ; as, *e.g.*, 'animal' applies to every swan but does not apply to some 'black,' while 'swan' applies to no 'black' ; so that supposing A to be assumed to apply to no B, and B to apply to some C, A does not apply to some C. Thus the conclusion is true although the premisses are false.

III. In the middle figure it is possible to reach a true conclusion by false premisses in every combination : (i.) if both premisses are wholly false ; [if each is partly false ;]^a (ii.) if one is true and the other wholly false, whichever is falsely assumed ; (iii.) if both are partly false ; (iv.) if one is absolutely true and the other partly false ; and if one is wholly false and the other partly true^b—both in universal and in particular syllogisms.

Second figure.
(1) Universal syllogisms.

(i.) If A applies to no B but to all C, as, *e.g.*, 'animal' Both premisses.

the wording in ch. iv, are at least tautologous with (iii.), and spoil the analysis.

^b This case is not treated in the discussion which follows.

55 b

παντί, ὅλον ζῶον λίθῳ μὲν οὐδενὶ ἵππῳ δὲ παντί,
 εἰς ἐναντιώως τεθῶσιν αἱ προτάσεις καὶ ληφθῇ τὸ
 Α τῷ μὲν Β παντί τῷ δὲ Γ μηδενί, ἐκ ψευδῶν ὅλων
 τῶν προτάσεων ἀληθὲς ἔσται τὸ συμπέρασμα.
 15 ὁμοίως δὲ καὶ εἰ τῷ μὲν Β παντί τῷ δὲ Γ μηδενί
 ὑπάρχει τὸ Α· ὁ γὰρ αὐτὸς ἔσται συλλογισμός.

Πάλιν εἰ ἡ μὲν ἑτέρα ὅλη ψευδὴς ἡ δ' ἑτέρα ὅλη
 ἀληθής· οὐδὲν γὰρ κωλύει τὸ Α καὶ τῷ Β καὶ τῷ Γ
 παντί ὑπάρχειν, τὸ μέντοι Β μηδενὶ τῷ Γ, ὅλον τὸ
 γένος τοῖς μὴ ὑπ' ἄλληλα εἶδεσιν· τὸ γὰρ ζῶον καὶ
 20 ἵππῳ παντί καὶ ἀνθρώπῳ, καὶ οὐδεὶς ἀνθρώπος
 ἵππος. εἰς οὖν ληφθῇ τὸ ζῶον τῷ μὲν παντί τῷ δὲ
 μηδενὶ ὑπάρχειν, ἡ μὲν ὅλη ψευδὴς ἔσται ἡ δ' ὅλη
 ἀληθής, καὶ τὸ συμπέρασμα ἀληθὲς πρὸς ὅποτε-
 ροῦν τεθέντος τοῦ στερητικοῦ.

Καὶ εἰ ἡ ἑτέρα ἐπὶ τι ψευδὴς ἡ δ' ἑτέρα ὅλη
 25 ἀληθής. ἐγχωρεῖ γὰρ τὸ Α τῷ μὲν Β τινὶ ὑπάρχειν
 τῷ δὲ Γ παντί, τὸ μέντοι Β μηδενὶ τῷ Γ, ὅλον ζῶον
 λευκῷ μὲν τινὶ κόρακι δὲ παντί, καὶ τὸ λευκὸν
 οὐδενὶ κόρακι. εἰς οὖν ληφθῇ τὸ Α τῷ μὲν Β
 μηδενὶ τῷ δὲ Γ ὅλῳ ὑπάρχειν, ἡ μὲν ΑΒ πρότασις
 ἐπὶ τι ψευδὴς ἡ δ' ΑΓ ὅλη ἀληθής, καὶ τὸ συμπέ-
 30 ρασμα ἀληθές. καὶ μετατιθεμένου δὲ τοῦ στερη-
 τικοῦ ὡσαύτως· διὰ γὰρ τῶν αὐτῶν ὄρων ἡ ἀπό-
 δεξις. καὶ εἰ ἡ καταφατικὴ πρότασις ἐπὶ τι
 ψευδὴς ἡ δὲ στερητικὴ ὅλη ἀληθής. οὐδὲν γὰρ
 κωλύει τὸ Α τῷ μὲν Β τινὶ ὑπάρχειν τῷ δὲ Γ ὅλῳ
 μὴ ὑπάρχειν, καὶ τὸ Β μηδενὶ τῷ Γ, ὅλον τὸ ζῶον
 35 λευκῷ μὲν τινὶ πίττῃ δ' οὐδεμιᾷ, καὶ τὸ λευκὸν
 οὐδεμιᾷ πίττῃ· ὥστ' εἰς ληφθῇ τὸ Α ὅλῳ τῷ Β

applies to no 'stone' but to all 'horse,' if the premisses are taken in the contrary sense and A is assumed to apply to all B but to no C, although the premisses are wholly false, the conclusion from them can be true. Similarly too if A applies to all B but to no C; for we shall get the same syllogism. wholly false.

(ii.) So again if one premiss is wholly false and the other wholly true; for there is no reason why A should not apply to all of both B and C, while B applies to no C; as, *e.g.*, a genus applies to co-ordinate species; for 'animal' applies both to every horse and to every man, and no man is a horse. Thus if 'animal' is assumed to apply to all of the one and to none of the other, one premiss will be wholly true and the other wholly false, and the conclusion will be true, to whichever of the two terms the negative is attached. One wholly false and one true premiss.

(iv.) So too if one premiss is partly false and the other wholly true. For it is possible for A to apply to some B and to all C, while B applies to no C; as, *e.g.*, 'animal' applies to some 'white' and to every crow, and 'white' applies to no crow. Thus if A is assumed to apply to no B but to the whole of C, the premiss AB will be partly false, and AC will be wholly true, and the conclusion will be true. Similarly too if the negative is transposed^a; for the proof will be effected through the same terms. So too if the affirmative premiss is partly false and the negative wholly true. For there is no reason why A should not apply to some B and yet not apply at all to C, while B applies to no C; as, *e.g.*, 'animal' applies to some 'white' but to no pitch, and 'white' applies to no pitch; so that if A is assumed to apply to the One partly false and one true premiss.

^a *i.e.*, if the minor premiss is negative.

65 b

ὑπάρχειν τῷ δὲ Γ μηδενί, ἢ μὲν ΑΒ ἐπὶ τι ψευδής, ἢ δ' ΑΓ ὅλη ἀληθής, καὶ τὸ συμπέρασμα ἀληθές.

Καὶ εἰ ἀμφοτέραι αἱ προτάσεις ἐπὶ τι ψευδεῖς, ἔσται τὸ συμπέρασμα ἀληθές. ἐγχωρεῖ γὰρ τὸ Α
 40 καὶ τῷ Β καὶ τῷ Γ τινὶ ὑπάρχειν, τὸ δὲ Β μηδενί
 50 α τῷ Γ, ὅσον ζῶον καὶ λευκῷ τινὶ καὶ μέλανι τινί, τὸ
 δὲ λευκὸν οὐδενὶ μέλανι. εἰάν οὖν ληφθῇ τὸ Α τῷ
 μὲν Β παντὶ τῷ δὲ Γ μηδενί, ἀμφω μὲν αἱ προτά-
 σεις ἐπὶ τι ψευδεῖς, τὸ δὲ συμπέρασμα ἀληθές.
 ὁμοίως δὲ καὶ μετατεθείσης τῆς στερητικῆς διὰ τῶν
 αὐτῶν ὄρων.

5 Φανερόν δὲ καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν·
 οὐδὲν γὰρ κωλύει τὸ Α τῷ μὲν Β παντὶ τῷ δὲ Γ
 τινὶ ὑπάρχειν, καὶ τὸ Β τῷ Γ τινὶ μὴ ὑπάρχειν, ὅσον
 ζῶον παντὶ ἀνθρώπῳ λευκῷ δὲ τινί, ἄνθρωπος δὲ
 τινὶ λευκῷ οὐχ ὑπάρξει. εἰάν οὖν τεθῇ τὸ Α τῷ μὲν
 10 Β μηδενί ὑπάρχειν τῷ δὲ Γ τινὶ ὑπάρχειν, ἢ μὲν
 καθόλου πρότασις ὅλη ψευδής, ἢ δ' ἐν μέρει ἀληθής,
 καὶ τὸ συμπέρασμα ἀληθές.

Ὡσαύτως δὲ καὶ καταφατικῆς λαμβανομένης τῆς
 ΑΒ· ἐγχωρεῖ γὰρ τὸ Α τῷ μὲν Β μηδενί τῷ δὲ Γ
 τινὶ μὴ ὑπάρχειν, καὶ τὸ Β τῷ Γ τινὶ μὴ ὑπάρχειν,
 15 ὅσον τὸ ζῶον οὐδενὶ ἀψύχῳ, λευκῷ δὲ τινὶ οὐχ
 ὑπάρχει,¹ καὶ τὸ ἄψυχον οὐχ ὑπάρξει τινὶ λευκῷ.
 εἰάν οὖν τεθῇ τὸ Α τῷ μὲν Β παντὶ τῷ δὲ Γ τινὶ μὴ
 ὑπάρχειν, ἢ μὲν ΑΒ πρότασις ἢ καθόλου ὅλη
 ψευδής, ἢ δὲ ΑΓ ἀληθής, καὶ τὸ συμπέρασμα
 ἀληθές.

Καὶ τῆς μὲν καθόλου ἀληθοῦς τεθείσης τῆς δ' ἐν
 20 μέρει ψευδοῦς. οὐδὲν γὰρ κωλύει τὸ Α μήτε τῷ Β

¹ οὐχ ὑπάρχει m, Bekker: οὐ C¹, Jenkinson: om. ABC¹

whole of B but to no C, AB will be partly false and AC wholly true, and the conclusion will be true.

(iii.) The conclusion can also be true if both premisses are partly false. For it is possible for A to apply to some of both B and C, while B applies to no C; as, *e.g.*, 'animal' applies to some 'white' and some 'black,' but 'white' applies to no 'black.' Thus if A is assumed to apply to all B but to no C, both premisses are partly false, but the conclusion is true. Similarly too if the negative premiss is transposed,^a the proof being effected through the same terms.

Both
premisses
partly false

It is evident that the same also holds good of particular syllogisms. For there is no reason why A should not apply to all B and some C, while B does not apply to some C; as, *e.g.*, 'animal' applies to every man and to some 'white,' but 'man' will not apply to some 'white.' Thus if A is taken to apply to no B but to some C, the universal premiss is wholly false, but the particular premiss is true, and so is the conclusion.

(2) Particular
syllogisms.
(i.) Major
wholly
false, minor
true.

Similarly too if the premiss AB is taken as affirmative; for it is possible for A to apply to no B, and not to apply to some C, and for B not to apply to some C; as, *e.g.*, 'animal' applies to nothing inanimate and does not apply to some 'white,' and 'inanimate' will not apply to some 'white.' Thus if A is taken to apply to all B and not to apply to some C, the universal premiss AB will be wholly false, but AC will be true, and the conclusion will be true too.

So too if the universal premiss is true and the particular premiss false. For there is no reason why

(ii.) Major
true, minor
false.

^a Cf. previous note.

56 a

μήτε τῷ Γ οὐδενὶ ἔπεσθαι, τὸ μέντοι Β τινὶ τῷ Γ μὴ ὑπάρχειν, ὅλον ζῶον οὐδενὶ ἀριθμῷ οὐδ' ἀψύχῳ, καὶ ὁ ἀριθμὸς τινὶ ἀψύχῳ οὐχ ἔπεται. εἰς οὖν τεθῇ τὸ Α τῷ μὲν Β μηδενὶ τῷ δὲ Γ τινί, τὸ μὲν συμπέρασμα ἔσται ἀληθές, καὶ ἡ καθόλου πρότασις ἀληθής
 25 ἢ δ' ἐν μέρει ψευδής.

Καὶ καταφατικῆς δὲ τῆς καθόλου τιθεμένης ὡσαύτως. ἐγχωρεῖ γὰρ τὸ Α καὶ τῷ Β καὶ τῷ Γ ὅλῳ ὑπάρχειν, τὸ μέντοι Β τινὶ τῷ Γ μὴ ἔπεσθαι, ὅλον τὸ γένος τῷ εἶδει καὶ τῇ διαφορᾷ· τὸ γὰρ ζῶον παντὶ ἀνθρώπῳ καὶ ὅλῳ πεζῷ ἔπεται, ἄνθρωπος δ'
 30 οὐ παντὶ πεζῷ· ὥστ' ἂν ληφθῇ τὸ Α τῷ μὲν Β ὅλῳ ὑπάρχειν τῷ δὲ Γ τινὶ μὴ ὑπάρχειν, ἢ μὲν καθόλου πρότασις ἀληθής ἢ δ' ἐν μέρει ψευδής, τὸ δὲ συμπέρασμα ἀληθές.

Φανερόν δὲ καὶ ὅτι ἐξ ἀμφοτέρων ψευδῶν ἔσται τὸ συμπέρασμα ἀληθές, εἴπερ ἐνδέχεται τὸ Α καὶ τῷ Β καὶ τῷ Γ ὅλῳ ὑπάρχειν, τὸ μέντοι Β τινὶ τῷ
 35 Γ μὴ ἔπεσθαι. ληφθέντος γὰρ τοῦ Α τῷ μὲν Β μηδενὶ τῷ δὲ Γ τινὶ ὑπάρχειν, αἱ μὲν προτάσεις ἀμφοτέραι ψευδεῖς, τὸ δὲ συμπέρασμα ἀληθές.

Ὅμοίως δὲ καὶ κατηγορικῆς οὐσης τῆς καθόλου προτάσεως τῆς δ' ἐν μέρει στερητικῆς. ἐγχωρεῖ γὰρ τὸ Α τῷ μὲν Β μηδενὶ τῷ δὲ Γ παντὶ ἔπεσθαι,
 40 καὶ τὸ Β τινὶ τῷ Γ μὴ ὑπάρχειν, ὅλον ζῶον ἐπιστήμη μὲν οὐδεμιᾷ ἀνθρώπῳ δὲ παντὶ ἔπεται, ἢ δ'
 56 b ἐπιστήμη οὐ παντὶ ἀνθρώπῳ. εἰς οὖν ληφθῇ τὸ Α τῷ μὲν Β ὅλῳ ὑπάρχειν τῷ δὲ Γ τινὶ μὴ ἔπεσθαι, αἱ μὲν προτάσεις ψευδεῖς, τὸ δὲ συμπέρασμα ἀληθές.

¹ ὅλῳ] τῷ μὲν ὅλῳ τῷ δὲ μηδενὶ fort. Boethius, ci. Jenkinson.

A should not be a consequent of none of either B or C, while B does not apply to some C ; as, *e.g.*, ' animal ' applies to no number or inanimate thing, and number is not a consequent of some inanimate things. Thus if A is taken to apply to no B but to some C, the conclusion and the universal premiss will be true, although the particular premiss will be false.

Similarly too if the universal premiss is taken as affirmative. For it is possible for A to apply to the whole of both B and C, and yet for B not to be a consequent of some C : as, *e.g.*, the genus applies to the species and the differentia ; for ' animal ' applies to every man and to all ' that which walks on land,' but ' man ' does not apply to everything that walks on land ; so that if A is assumed to apply to the whole of B but not to apply to some C, the universal premiss will be true and the particular false, but the conclusion will be true.

It is evident also that the conclusion drawn from premisses which are both false can be true, since it is possible for A to apply to the whole of both B and C, and yet for B not to be a consequent of some C. For if A is assumed to apply to no B but to some C, both premisses will be false, but the conclusion will be true. (iii.) Both premisses false.

Similarly too if the universal premiss is affirmative and the particular negative. For it is possible for A to be a consequent of no B but of all C, and for B not to apply to some C : as, *e.g.*, ' animal ' is a consequent of no ' knowledge ' but of all ' man,' and ' knowledge ' is not a consequent of all ' man.' Thus if A is assumed to apply to the whole of B, but not to be a consequent of some C, the premisses will be false, but the conclusion will be true.

IV. Ἔσται δὲ καὶ ἐν τῷ ἐσχάτῳ σχήματι διὰ
 5 ψευδῶν ἀληθές, καὶ ἀμφοτέρων ψευδῶν οὐσῶν
 ὄλων καὶ ἐπὶ τι ἑκατέρας, καὶ τῆς μὲν ἑτέρας
 ἀληθοῦς ὅλης τῆς δ' ἑτέρας ψευδοῦς, καὶ τῆς μὲν
 ἐπὶ τι ψευδοῦς τῆς δ' ὅλης ἀληθοῦς, καὶ ἀνάπαλιν,
 καὶ ὅσαχῶς ἄλλως ἐγχωρεῖ μεταλαβεῖν τὰς προτά-
 10 σεις. οὐδὲν γὰρ κωλύει μήτε τὸ Α μήτε τὸ Β
 μηδενὶ τῷ Γ ὑπάρχειν, τὸ μέντοι Α τινὶ τῷ Β
 ὑπάρχειν, ὅλον οὐτ' ἄνθρωπος οὔτε πεζὸν οὐδενὶ
 ἀψύχῳ ἔπεται, ἄνθρωπος μέντοι τινὶ πεζῷ ὑπάρχει.
 εἰάν οὖν ληφθῇ τὸ Α καὶ τὸ Β παντὶ τῷ Γ ὑπάρχειν,
 αἱ μὲν προτάσεις ὅλαι ψευδεῖς, τὸ δὲ συμπέρασμα
 ἀληθές. ὡσαύτως δὲ καὶ τῆς μὲν στερητικῆς τῆς
 15 δὲ καταφατικῆς οὔσης. ἐγχωρεῖ γὰρ τὸ μὲν Β
 μηδενὶ τῷ Γ ὑπάρχειν τὸ δὲ Α παντί, καὶ τὸ Α τινὶ
 τῷ Β μὴ ὑπάρχειν, ὅλον τὸ μέλαν οὐδενὶ κύκλῳ
 ζῶον δὲ παντί, καὶ τὸ ζῶον οὐ παντὶ μέλανι· ὥστ'
 ἂν ληφθῇ τὸ μὲν Β παντὶ τῷ Γ τὸ δὲ Α μηδενί, τὸ
 20 Α τινὶ τῷ Β οὐχ ὑπάρξει· καὶ τὸ μὲν συμπέρασμα
 ἀληθές, αἱ δὲ προτάσεις ψευδεῖς.

Καὶ εἰ ἐπὶ τι ἑκατέρα ψευδής, ἔσται τὸ συμπέ-
 ρασμα ἀληθές. οὐδὲν γὰρ κωλύει καὶ τὸ Α καὶ τὸ Β
 τινὶ τῷ Γ ὑπάρχειν, καὶ τὸ Α τινὶ τῷ Β, ὅλον τὸ
 λευκὸν καὶ τὸ καλὸν τινὶ ζῳῷ ὑπάρχει, καὶ τὸ
 25 λευκὸν τινὶ καλῷ. εἰάν οὖν τεθῇ τὸ Α καὶ τὸ Β
 παντὶ τῷ Γ ὑπάρχειν, αἱ μὲν προτάσεις ἐπὶ τι
 ψευδεῖς, τὸ δὲ συμπέρασμα ἀληθές. καὶ στερη-
 τικῆς δὲ τῆς ΑΓ τιθεμένης ὁμοίως. οὐδὲν γὰρ
 κωλύει τὸ μὲν Α τινὶ τῷ Γ μὴ ὑπάρχειν τὸ δὲ Β
 τινὶ ὑπάρχειν, καὶ τὸ Α τῷ Β μὴ παντὶ ὑπάρχειν,
 430

IV. In the last figure too it will be possible to reach a true conclusion by means of false premisses : (i.) when both premisses are wholly false, (ii.) when each of them is partly false, (iii.) when one is wholly true and the other wholly false, (iv.) when one is partly false and the other wholly true ; and *vice versa* ; and in all other possible combinations of premisses. For (i.) there is no reason why, although neither A nor B applies to any C, A should not apply to some B : as, *e.g.*, neither 'man' nor 'that which walks on land' is a consequent of anything inanimate, yet 'man' applies to some things which walk on land. Thus if A and B are assumed to apply to all C, the premisses will be wholly false, but the conclusion will be true. Similarly too if one premiss is negative and the other affirmative. For it is possible for B to apply to no C, and A to all C, and for A not to apply to some B : as, *e.g.*, 'black' applies to no swan, and 'animal' to every swan, and 'animal' does not apply to everything black ; so that if B is assumed to apply to all C, and A to no C, A will not apply to some B ; and the conclusion will be true although the premisses are false.

Third figure.
(1) Universal
syllogisms.

(i.) Both
premisses
wholly
false.

(ii.) So too if each of the premisses is partly false, the conclusion can be true. For there is no reason why both A and B should not apply to some C, while A applies to some B : as, *e.g.*, 'white' and 'beautiful' apply to some 'animal,' and 'white' to some 'beautiful.' Thus if A and B are taken to apply to all C, the premisses will be partly false, but the conclusion will be true. Similarly too if AC is taken as negative. For it is quite possible that A should not apply to some C, and B should apply to some C, and A should not apply to all B : as, *e.g.*, 'white' does not apply

(ii.) Both
premisses
partly false.

56 b

30 οἷον τὸ λευκὸν τινὶ ζῳῷ οὐχ ὑπάρχει, τὸ δὲ καλὸν
 τινὶ ὑπάρχει, καὶ τὸ λευκὸν οὐ παντὶ καλῷ· ὥστ'
 ἂν ληφθῇ τὸ μὲν Α μηδενὶ τῷ Γ τὸ δὲ Β παντί,
 ἀμφοτέραι μὲν αἱ προτάσεις ἐπὶ τι ψευδεῖς, τὸ δὲ
 συμπέρασμα ἀληθές.

᾿Ωσαύτως δὲ καὶ τῆς μὲν ὅλης ψευδοῦς τῆς δ'
 ὅλης ἀληθοῦς λαμβανομένης. ἐγχωρεῖ γὰρ καὶ τὸ
 35 Α καὶ τὸ Β παντὶ τῷ Γ ἔπασθαι, τὸ μέντοι Α τινὶ
 τῷ Β μὴ ὑπάρχειν, οἷον ζῶον καὶ λευκὸν παντὶ
 κύκνῳ ἔπεται, τὸ μέντοι ζῶον οὐ παντὶ ὑπάρχει
 λευκῷ. τεθέντων οὖν ὅρων τούτων ἔαν ληφθῇ τὸ
 μὲν Β ὅλῳ τῷ Γ ὑπάρχειν τὸ δὲ Α ὅλῳ μὴ ὑπάρχειν,
 ἢ μὲν ΒΓ ὅλη ἔσται ἀληθὴς ἢ δὲ ΑΓ ὅλη ψευδής,
 40 καὶ τὸ συμπέρασμα ἀληθές. ὁμοίως δὲ καὶ εἰ τὸ
 μὲν ΒΓ ψεῦδος τὸ δὲ ΑΓ ἀληθές· οἱ γὰρ αὐτοὶ ὅροι
 57 α πρὸς τὴν ἀπόδειξιν [μέλαν, κύκνος, ἄψυχον].¹ ἀλλὰ
 καὶ εἰ ἀμφοτέραι λαμβάνονται καταφατικαί· οὐδὲν
 γὰρ κωλύει τὸ μὲν Β παντὶ τῷ Γ ἔπασθαι, τὸ δὲ Α
 ὅλῳ μὴ ὑπάρχειν, καὶ τὸ Α τινὶ τῷ Β ὑπάρχειν,
 60 οἷον κύκνῳ [μὲν]² παντὶ ζῶον, μέλαν δ' οὐδενὶ
 κύκνῳ, καὶ τὸ μέλαν ὑπάρχει τινὶ ζῳῷ· ὥστ' ἂν
 ληφθῇ τὸ Α καὶ τὸ Β παντὶ τῷ Γ ὑπάρχειν, ἢ μὲν
 ΒΓ ὅλη ἀληθὴς ἢ δὲ ΑΓ ὅλη ψευδής, καὶ τὸ
 συμπέρασμα ἀληθές. ὁμοίως δὲ καὶ τῆς ΑΓ
 ληφθείσης ἀληθοῦς· διὰ γὰρ τῶν αὐτῶν ὅρων ἢ
 ἀπόδειξις.

10 Πάλιν τῆς μὲν ὅλης ἀληθοῦς οὔσης τῆς δ' ἐπὶ τι
 ψευδοῦς. ἐγχωρεῖ γὰρ τὸ μὲν Β παντὶ τῷ Γ ὑπάρ-
 χειν τὸ δὲ Α τινί, καὶ τὸ Α τινὶ τῷ Β, οἷον δῖπουν

¹ secl. Waitz.² om. Bnfu, Boethius, Waitz.

* These are not the same terms as before ; they are derived

PRIOR ANALYTICS, II. iv

to some animals, and 'beautiful' applies to some, and 'white' does not apply to everything beautiful ; so that if A is assumed to apply to no C, and B to all C, both premisses will be partly false, but the conclusion will be true.

(iii.) So too if one premiss is wholly false and the other wholly true. For it is possible for both A and B to be consequents of all C, and yet for A not to apply to some B : as, *e.g.*, 'animal' and 'white' are consequents of all 'swan,' yet 'animal' does not apply to everything white. Thus these terms being posited, if it is assumed that B applies but A does not apply to the whole of C, BC will be wholly true and AC wholly false, and the conclusion will be true. Similarly too if BC is false and AC true ; the same terms [black—swan—inanimate]^a will serve for the purpose of proof. So too if both premisses are assumed as affirmative. For there is no reason why, while B is a consequent of all C, and A does not apply to the whole of C, A should not apply to some B : as, *e.g.*, 'animal' applies to every swan, 'black' to no swan, and 'black' to some animals ; so that if A and B are assumed to apply to all C, BC will be wholly true, and AC wholly false, and the conclusion will be true. Similarly if the premiss AC which we assume is true ; for the proof will be effected by means of the same terms.

(iv.) So again when one premiss is wholly true and the other partly false. For it is possible for B to apply to all C, and A to some C, and for A to apply to some B : as, *e.g.*, 'biped' applies, but 'beautiful'

(iii.) One wholly false and one true premiss.

(iv.) One true and one partly false premiss.

(according to the scholiast on 189 a 5-11) from the lost commentary of Alexander, who saw that a fresh set of examples was needed.

57 a

μέν παντί ἀνθρώπῳ, καλὸν δ' οὐ παντί, καὶ τὸ
 καλὸν τινὶ δίποδι ὑπάρχει. εἰάν οὖν ληφθῇ καὶ τὸ
 Α καὶ τὸ Β ὅλῳ τῷ Γ ὑπάρχειν, ἢ μὲν ΒΓ ὅλη
 15 ἀληθὴς ἢ δὲ ΑΓ ἐπὶ τι ψευδής, τὸ δὲ συμπέρασμα
 ἀληθές. ὁμοίως δὲ καὶ τῆς μὲν ΑΓ ἀληθοῦς τῆς δὲ
 ΒΓ ψευδοῦς ἐπὶ τι λαμβανομένης· μετατεθέντων
 γὰρ τῶν αὐτῶν ὄρων ἔσται ἡ ἀπόδειξις. καὶ τῆς
 μὲν στερητικῆς τῆς δὲ καταφατικῆς οὔσης. ἐπεὶ
 γὰρ ἐγχωρεῖ τὸ μὲν Β ὅλῳ τῷ Γ ὑπάρχειν τὸ δὲ Α
 20 τινί, καὶ ὅταν οὕτως ἔχωσιν οὐ παντί τῷ Β τὸ Α,
 εἰάν ληφθῇ τὸ μὲν Β ὅλῳ τῷ Γ ὑπάρχειν τὸ δὲ Α
 μηδενί, ἢ μὲν στερητικὴ ἐπὶ τι ψευδής, ἢ δ' ἑτέρα
 ὅλη ἀληθὴς καὶ τὸ συμπέρασμα. πάλιν ἐπεὶ δέ-
 δεικται ὅτι τοῦ μὲν Α μηδενὶ ὑπάρχοντος τῷ Γ τοῦ
 25 δὲ Β τινὶ ἐγχωρεῖ τὸ Α τινὶ τῷ Β μὴ ὑπάρχειν,
 φανερόν ὅτι καὶ τῆς μὲν ΑΓ ὅλης ἀληθοῦς οὔσης
 τῆς δὲ ΒΓ ἐπὶ τι ψευδοῦς ἐγχωρεῖ τὸ συμπέρασμα
 εἶναι ἀληθές. εἰάν γὰρ ληφθῇ τὸ μὲν Α μηδενὶ τῷ
 Γ τὸ δὲ Β παντί, ἢ μὲν ΑΓ ὅλη ἀληθὴς ἢ δὲ ΒΓ
 ἐπὶ τι ψευδής.

Φανερόν δὴ¹ καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν
 30 ὅτι πάντως ἔσται διὰ ψευδῶν ἀληθές. οἱ γὰρ αὐτοὶ
 ὅροι ληπτέοι καὶ ὅταν καθόλου ὦσιν αἱ προτάσεις,
 οἱ μὲν ἐν τοῖς κατηγορικοῖς κατηγορικοί, οἱ δ' ἐν
 τοῖς στερητικοῖς στερητικοί. οὐδὲν γὰρ διαφέρει
 μηδενὶ ὑπάρχοντος παντί λαβεῖν ὑπάρχειν, καὶ τινὶ
 35 ὑπάρχοντος καθόλου λαβεῖν ὑπάρχειν πρὸς τὴν τῶν
 ὄρων ἑκθεσιν. ὁμοίως δὲ καὶ ἐπὶ τῶν στερητικῶν.

Φανερόν οὖν ὅτι ἂν μὲν ἢ τὸ συμπέρασμα ψεῦδος,
 ἀνάγκη ἐξ ὧν ὁ λόγος ψευδῇ εἶναι ἢ πάντα ἢ ἓν,

¹ δὴ scripsi: δέ.

does not apply, to all 'man,' and 'beautiful' applies to some 'biped.' Thus if both A and B are assumed to apply to the whole of C, BC will be wholly true, and AC partly false, but the conclusion will be true. Similarly too if the assumed premiss AC is true and BC is partly false; the proof can be effected by a rearrangement of the same terms. So too if one premiss is negative and the other affirmative. For since it is possible for B to apply to the whole and A to some of C, and when the terms are thus related A does not apply to all B, if B is assumed to apply to the whole and A to none of C, the negative premiss will be partly false, but the other will be wholly true, and the conclusion will be true. Again, since it has been shown ^a that when A applies to no C and B to some C, it is possible for A not to apply to some B, it is evident that when AC is wholly true and BC partly false, it is still possible for the conclusion to be true. For if A is assumed to apply to no C, and B to all C, AC will be wholly true and BC partly false.

It is evident, then, that in the case of particular syllogisms also it will be possible under any conditions to reach a true conclusion by means of false premisses. For the same terms are to be assumed as when the premisses are universal: affirmative terms in affirmative and negative in negative syllogisms. For it makes no difference to the positing of the terms whether we assume that that which applies to none applies to all, or that that which applies to some applies universally. Similarly too in the case of negative syllogisms.

Thus it is evident that whereas if the conclusion is false the grounds of the argument, either all or

(2) Particular syllogisms.

Why it is that false premisses

^a 54 a 1.

57^a ὅταν δ' ἀληθές, οὐκ ἀνάγκη ἀληθές εἶναι οὔτε τι
 οὔτε πάντα, ἀλλ' ἔστι μηδενὸς ὄντος ἀληθοῦς τῶν
 40 ἐν τῷ συλλογισμῷ τὸ συμπέρασμα ὁμοίως εἶναι
 57^b ἀληθές, οὐ μὴν ἐξ ἀνάγκης. αἴτιον δ' ὅτι ὅταν δύο
 ἔχῃ οὕτω πρὸς ἀλλήλα ὥστε θατέρου ὄντος ἐξ
 ἀνάγκης εἶναι θάτερον, τούτου μὴ ὄντος μὲν οὐδὲ
 θάτερον ἔσται, ὄντος δ' οὐκ ἀνάγκη εἶναι θάτερον.
 τοῦ δ' αὐτοῦ ὄντος καὶ μὴ ὄντος ἀδύνατον ἐξ
 5 ἀνάγκης εἶναι τὸ αὐτό. λέγω δ' οἷον τοῦ Α ὄντος
 λευκοῦ τὸ Β εἶναι μέγα ἐξ ἀνάγκης, καὶ μὴ ὄντος
 λευκοῦ τοῦ Α τὸ Β εἶναι μέγα ἐξ ἀνάγκης. ὅταν
 γὰρ τουδὶ ὄντος λευκοῦ τοῦ Α τοδὶ ἀνάγκη μέγα
 εἶναι τὸ Β, μεγάλου δὲ τοῦ Β ὄντος τὸ Γ μὴ
 λευκόν, ἀνάγκη, εἰ τὸ Α λευκόν, τὸ Γ μὴ εἶναι
 10 λευκόν. καὶ ὅταν δύο ὄντων θατέρου ὄντος ἀνάγκη
 θάτερον εἶναι, τούτου μὴ ὄντος ἀνάγκη τὸ Α μὴ
 εἶναι. τοῦ δὴ Β μὴ ὄντος μεγάλου τὸ Α οὐχ οἷον
 τε λευκόν εἶναι. τοῦ δὲ Α μὴ ὄντος λευκοῦ, εἰ
 ἀνάγκη τὸ Β μέγα εἶναι, συμβαίνει ἐξ ἀνάγκης τοῦ
 Β μεγάλου μὴ ὄντος αὐτὸ τὸ Β εἶναι μέγα. τοῦτο
 15 δ' ἀδύνατον· εἰ γὰρ τὸ Β μὴ ἔστι μέγα, τὸ Α οὐκ
 ἔσται λευκόν ἐξ ἀνάγκης. εἰ οὖν μὴ ὄντος τούτου
 λευκοῦ τὸ Β ἔσται μέγα, συμβαίνει, εἰ τὸ Β μὴ
 ἔστι μέγα, εἶναι μέγα, ὥς διὰ τριῶν.

V. Τὸ δὲ κύκλῳ καὶ ἐξ ἀλλήλων δείκνυσθαι ἔστι
 τὸ διὰ τοῦ συμπεράσματος καὶ τοῦ ἀνάπαλιν τῇ
 20 κατηγορίᾳ τὴν ἑτέραν λαβόντα πρότασιν συμπερά-
 νασθαι τὴν λοιπὴν, ἣν ἐλάμβανεν ἐν θατέρῳ συλ-
 λογισμῷ· οἷον εἰ ἔδει δεῖξαι ὅτι τὸ Α τῷ Γ παντὶ

• i.e. premiss.

• Because A stands for the conjunction of two premisses;
 cf. 34 a 16-24.

some of them, must be false, when the conclusion is true, it is not necessary for all or any of the grounds to be true ; but even when no part ^a of the syllogism is true it is possible—although it does not necessarily follow—that the conclusion should be true. The reason for this is that when two things are so inter-related that when the first is the second must be, when the second is not, neither will the first be ; but when the second is, the first need not necessarily be. For it is impossible that the same thing should *necessarily* be whether the same determining factor does or does not apply. I mean, for example, that it is impossible that B should necessarily be great both when A is white and when A is not white. For when, if this particular thing A is white, this particular thing B must be great, and if B is great C cannot be white, then if A is white, C cannot be white. And when, if the former of two things is, the latter must be, if the latter is not, the former, A, cannot be. Then when B is not great, A cannot be white. But if when A is not white B must be great, it follows of necessity that when B is not great B itself *is* great. But this is impossible ; for if B is not great, A will necessarily not be white. Thus if B is to be great when A is not white, it follows that if B is not great, it is great, just as though the proof were effected by three terms.^b

can yield
a true
conclusion.

V. Circular or reciprocal proof consists in using the conclusion and the simple conversion ^c of one premiss to demonstrate the remaining premiss, which was assumed in the original syllogism ; as if, for example, supposing that it was required to prove that A applies to all C, and this had been proved by

Method of
circular or
reciprocal
proof.

^a *i.e.* the premiss with subject and predicate interchanged.

57 b

ὑπάρχει, ἔδειξε δὲ διὰ τοῦ Β, πάλιν εἰ δεικνύοι ὅτι
 τὸ Α τῷ Β ὑπάρχει, λαβὼν τὸ μὲν Α τῷ Γ ὑπάρχειν
 τὸ δὲ Γ τῷ Β, καὶ τὸ Α τῷ Β (πρότερον δ' ἀνά-
 25 παλιν ἔλαβε τὸ Β τῷ Γ ὑπάρχειν). ἢ εἰ ὅτι τὸ Β τῷ Γ
 δεῖ δεῖξαι ὑπάρχον, εἰ λάβοι τὸ Α κατὰ τοῦ Γ, ὃ
 ἦν συμπέρασμα, τὸ δὲ Β κατὰ τοῦ Α ὑπάρχειν
 (πρότερον δ' ἐλήφθη ἀνάπαλιν τὸ Α κατὰ τοῦ Β).
 ἄλλως δ' οὐκ ἔστιν ἐξ ἀλλήλων δεῖξαι. εἴτε γάρ
 30 ἄλλο μέσον λήψεται, οὐ κύκλῳ (οὐδὲν γὰρ λαμβά-
 νεται τῶν αὐτῶν), εἴτε τούτων τι, ἀνάγκη θάτερον
 μόνον· εἰ γὰρ ἄμφω, ταὐτὸ ἔσται συμπέρασμα, δεῖ
 δ' ἕτερον.

Ἐν μὲν οὖν τοῖς μὴ ἀντιστρέφουσιν ἐξ ἀναπο-
 δείκτου τῆς ἐτέρας προτάσεως γίννεται ὁ συλ-
 λογισμός· οὐ γὰρ ἔστιν ἀποδείξαι διὰ τούτων τῶν
 35 ὄρων ὅτι τῷ μέσῳ τὸ τρίτον ὑπάρχει ἢ τῷ πρώτῳ
 τὸ μέσον. ἐν δὲ τοῖς ἀντιστρέφουσιν ἔστι πάντα
 δεικνύναι δι' ἀλλήλων, ὅλον εἰ τὸ Α καὶ τὸ Β καὶ
 τὸ Γ ἀντιστρέφουσιν ἀλλήλοις. δεδείχθω γὰρ τὸ
 ΑΓ διὰ μέσου τοῦ Β, καὶ πάλιν τὸ ΑΒ διὰ τε τοῦ
 συμπεράσματος καὶ διὰ τῆς ΒΓ προτάσεως ἀντι-
 40 στραφείσης, ὡσαύτως δὲ καὶ τὸ ΒΓ διὰ τε τοῦ
 58 συμπεράσματος καὶ τῆς ΑΒ προτάσεως ἀντεστραμ-
 μένης. δεῖ δὲ τήν τε ΓΒ καὶ τήν ΒΑ πρότασιν
 ἀποδείξαι· ταύταις γὰρ ἀναποδείκτοις κεχρήμεθα
 μόναις. ἐὰν οὖν ληφθῇ τὸ Β παντὶ τῷ Γ ὑπάρχειν
 καὶ τὸ Γ παντὶ τῷ Α, συλλογισμός ἔσται τοῦ Β
 5 πρὸς τὸ Α. πάλιν ἐὰν ληφθῇ τὸ μὲν Γ παντὶ τῷ Α
 τὸ δὲ Α παντὶ τῷ Β, παντὶ τῷ Β τὸ Γ ἀνάγκη

means of B, it were then to be proved in turn that A applies to B by assuming that A applies to C and C to B, and therefore A to B ; whereas in the original syllogism it was conversely assumed that B applies to C ; or if, supposing that it is required to prove that B applies to C, one should assume that A applies as the predicate of C, which was the conclusion before, and B as the predicate of A ; whereas in the original syllogism it was conversely assumed that A is predicated of B. Reciprocal proof is impossible in any other way. For (1) if we assume a different middle term, the proof will not be circular, since none of the same propositions is assumed ; and (2) if we assume any of them, it must be one only ; for if both are assumed, we shall have the same conclusion as before, whereas we require another.

Thus where conversion is impossible, one of the premisses from which the syllogism results is undemonstrated ; for it is impossible to demonstrate from the given terms that the third applies to the middle or the middle to the first term. But where conversion is possible, *i.e.*, if A and B and C are convertible with one another, they can all be proved reciprocally. For let AC be proved by means of the middle B, and AB again by means of the conclusion and the premiss BC converted, and BC also in the same way by means of the conclusion and the premiss AB after conversion. We must, however, prove the premisses CB and BA ; for these are the only premisses of those which we have used that remain undemonstrated. If, then, B is assumed to apply to all C and C to all A, we shall have a syllogism giving the relation of B to A. Again, if C is assumed to apply to all A, and A to all B, C must apply to all B.

58 a

ὑπάρχειν. ἐν ἀμφοτέροις δὴ τούτοις τοῖς συλλογισμοῖς ἢ ΓΑ πρότασις εἰληπται ἀναπόδεικτος (αἱ γὰρ ἕτεραι δεδειγμέναι ἦσαν), ὥστ' ἂν ταύτην ἀποδείξωμεν, ἅπασαι ἔσονται δεδειγμέναι δι' ἁλλήλων. ἐὰν οὖν ληφθῇ τὸ Γ παντὶ τῷ Β καὶ τὸ Β παντὶ τῷ Α ὑπάρχειν, ἀμφοτέραί τε αἱ προτάσεις ἀποδεδειγμέναι λαμβάνονται, καὶ τὸ Γ τῷ Α ἀνάγκη ὑπάρχειν.

Φανερόν οὖν ὅτι ἐν μόνοις τοῖς ἀντιστρέφουσι κύκλῳ καὶ δι' ἁλλήλων ἐνδέχεται γίνεσθαι τὰς ἀποδείξεις, ἐν δὲ τοῖς ἄλλοις ὡς πρότερον εἶπομεν. συμβαίνει δὲ καὶ ἐν τούτοις αὐτῷ τῷ δεικνυμένῳ χρῆσθαι πρὸς τὴν ἀπόδειξιν· τὸ μὲν γὰρ Γ κατὰ τοῦ Β καὶ τὸ Β κατὰ τοῦ Α δέικνυται ληφθέντος τοῦ Γ κατὰ τοῦ Α λέγεσθαι, τὸ δὲ Γ κατὰ τοῦ Α διὰ τούτων δέικνυται τῶν προτάσεων, ὥστε τῷ συμ-
20 περάσματι χρώμεθα πρὸς τὴν ἀπόδειξιν.

Ἐπὶ δὲ τῶν στερητικῶν συλλογισμῶν ὥδε δέικνυται ἐξ ἁλλήλων. ἔστω τὸ μὲν Β παντὶ τῷ Γ ὑπάρχον, τὸ δὲ Α οὐδενὶ τῶν Β· συμπέρασμα ὅτι τὸ Α οὐδενὶ τῶν Γ. εἰ δὴ πάλιν δεῖ συμπεράνασθαι
25 ὅτι τὸ Α οὐδενὶ τῶν Β, ὃ πάλαι ἔλαβεν, ἔσται τὸ μὲν Α μηδενὶ τῷ Γ τὸ δὲ Γ παντὶ τῷ Β· οὕτω γὰρ ἀνάπαλιν ἢ πρότασις. εἰ δ' ὅτι τὸ Β τῷ Γ δεῖ συμπεράνασθαι, οὐκέθ' ὁμοίως ἀντιστρεπτέον τὸ ΑΒ (ἢ γὰρ αὕτη πρότασις τὸ Β μηδενὶ τῷ Α καὶ τὸ Α μηδενὶ τῷ Β ὑπάρχειν), ἀλλὰ ληπτέον, ὥ τὸ
30 Α μηδενὶ ὑπάρχει, τὸ Β παντὶ ὑπάρχειν. ἔστω τὸ Α μηδενὶ τῶν Γ ὑπάρχον,¹ ὅπερ ἦν τὸ συμπέρασμα,

¹ ὑπάρχον scripsi: ὑπάρχειν.

PRIOR ANALYTICS, II. v

Now in both these syllogisms the premiss CA has been assumed without being demonstrated ; the others were already proved. Thus if we demonstrate this, they will all have been proved reciprocally. If, then, C is assumed to apply to all B, and B to all A, both the premisses assumed have been demonstrated, and C must apply to all A.

Thus it is evident that circular and reciprocal demonstrations can only be effected where conversion is possible ; in the case of other syllogisms they can only be used as described above. In these also it happens that we use the very thing which is to be proved for the purpose of the demonstration ; for we prove that C is predicated of B and B of A by assuming that C is predicated of A, and we prove that C is predicated of A by means of these premisses ; so that we use the conclusion for the purpose of the demonstration.

In negative syllogisms reciprocal proof is effected as follows. Let B apply to all C, and A to no B. The conclusion is that A applies to no C. Then if it is required to establish in turn that A applies to no B, which was assumed before, we shall have the premisses that A applies to no C, and that C applies to all B ; for in this way the premiss BC is reversed. If, on the other hand, it is required to establish that B applies to C, the premiss AB must not be converted again as before (for the premiss ' B applies to no A ' is the same as ' A applies to no B ') ; but we must assume that B applies to all of that to none of which A applies.^a Let A apply to no C, which was the conclusion before,

Reciprocal
proof in
negative
syllogisms.

^a Aristotle is guilty of *petitio principii* ; this is exactly what is required to be proved.

58 a

ὥ δὲ τὸ Α μηδενί, τὸ Β εἰλήφθω παντὶ ὑπάρχειν·
ἀνάγκη οὖν τὸ Β παντὶ τῷ Γ ὑπάρχειν.

Ὡστε τριῶν ὄντων ἕκαστον συμπέρασμα γέγονε,
καὶ τὸ κύκλῳ ἀποδεικνύειν τοῦτ' ἔστι, τὸ συμπέ-
35 ρασμα λαμβάνοντα καὶ ἀνάπαλιν τὴν ἑτέραν πρό-
τασιν τὴν λοιπὴν συλλογίζεσθαι.

Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν τὴν μὲν
καθόλου πρότασιν οὐκ ἔστιν ἀποδείξαι διὰ τῶν
ἑτέρων, τὴν δὲ κατὰ μέρος ἔστιν. ὅτι μὲν οὖν οὐκ
ἔστιν ἀποδείξαι τὴν καθόλου φανερόν· τὸ μὲν γὰρ
καθόλου δείκνυται διὰ τῶν καθόλου, τὸ δὲ συμ-
πέρασμα οὐκ ἔστι καθόλου, δεῖ δ' ἐκ τοῦ
40 συμπεράσματος δεῖξαι καὶ τῆς ἑτέρας προτάσεως
58 b (ἔτι ὅλως οὐδὲ γίγνεται συλλογισμὸς ἀντιστρα-
φείσης τῆς προτάσεως· ἐν μέρει γὰρ ἀμφότεραι
γίνονται αἱ προτάσεις)· τὴν δ' ἐπὶ μέρους ἔστιν.
δεδειχθῶ γὰρ τὸ Α κατὰ τινὸς τοῦ Γ διὰ τοῦ Β.
ἐὰν οὖν ληφθῇ τὸ Β παντὶ τῷ Α καὶ τὸ συμπέρασμα
6 μείη, τὸ Β τινὶ τῷ Γ ὑπάρξει· γίγνεται γὰρ τὸ
πρῶτον σχῆμα, καὶ τὸ Α μέσον.

Εἰ δὲ στερητικὸς ὁ συλλογισμὸς, τὴν μὲν καθόλου
πρότασιν οὐκ ἔστι δεῖξαι, δι' ὃ¹ καὶ πρότερον
ἐλέχθη· τὴν δ' ἐν μέρει ἔστιν,² ἐὰν³ ὁμοίως ἀντι-
στραφῇ τὸ ΑΒ ὥσπερ καπὶ τῶν καθόλου,⁴ οἷον ὥ
10 τὸ Α τινὶ μὴ ὑπάρχει, τὸ Β τινὶ ὑπάρχειν· ἄλλως
γὰρ οὐ γίγνεται συλλογισμὸς διὰ τὸ ἀποφατικὴν
εἶναι τὴν ἐν μέρει πρότασιν.

VI. Ἐν δὲ τῷ δευτέρῳ σχήματι τὸ μὲν κατα-

¹ δι' ὃ Buhle: δι' ὅ.

² ἔστιν om. Cu, Bekker.

³ ἐὰν μὲν Α²Ccmfn², ἐὰν μὲν οὖν Β².

⁴ καθόλου ΑΒ¹: καθόλου, οὐκ ἔστι, διὰ προσλήψεως δ' ἔστιν
uolgo.

PRIOR ANALYTICS, II. v-vi

and let it be assumed that B applies to all of that to none of which A applies. Then B must apply to all C.

Thus each of the three propositions has been inferred as a conclusion ; and that is what circular demonstration is, viz., to assume the conclusion and the converse of one premiss, and so infer the remaining premiss.

In particular syllogisms the universal premiss cannot be demonstrated by means of the others, but the particular premiss can. That the universal premiss cannot be demonstrated is evident ; for the universal is proved by universal premisses, but the conclusion is not universal, and we have to draw our proof from the conclusion and the other premiss. Moreover, if the premiss is converted no syllogism at all results ; because both premisses become particular. The particular premiss, however, can be demonstrated. Let it be proved, by means of B, that A is stated of some C. Then if B is assumed to apply to all A, and the conclusion stands, B will apply to some C ; for we get the first figure with A as the middle.

Reciprocal
proof in
particular
syllogisms

If on the other hand the syllogism is negative, the universal premiss cannot be proved, for the reason explained above. But the particular premiss can be proved, if AB is converted in the same way as in universal syllogisms ; viz., to the effect that B applies to some of that to some of which A does not apply.^a Otherwise no syllogism results, because the particular premiss is negative.

VI. In the second figure the affirmative statement

Reciprocal
proof in th

^a Cf. 58 a 29 note.

φατικὸν οὐκ ἔστι δεῖξαι διὰ τούτου τοῦ τρόπου, τὸ
 15 δὲ στερητικὸν ἔστιν. τὸ μὲν οὖν κατηγορικὸν οὐ
 δείκνυται διὰ τὸ μὴ ἀμφοτέρας εἶναι τὰς προτάσεις
 καταφατικάς· τὸ γὰρ συμπέρασμα στερητικὸν ἔστι,
 τὸ δὲ κατηγορικὸν ἐξ ἀμφοτέρων ἐδείκνυτο κατα-
 φατικῶν· τὸ δὲ στερητικὸν ὥδε δείκνυται. ὑπαρ-
 χέτω τὸ Α παντὶ τῷ Β τῷ δὲ Γ μηδενί· συμπέρασμα
 20 τὸ Β οὐδενὶ τῷ Γ. εἰάν οὖν ληφθῇ τὸ Β παντὶ τῷ Α
 ὑπάρχον [τῷ δὲ Γ μηδενί],¹ ἀνάγκη τὸ Α μηδενὶ τῷ
 Γ ὑπάρχειν· γίγνεται γὰρ τὸ δεύτερον σχῆμα (μέσον
 τὸ Β). εἰ δὲ τὸ ΑΒ στερητικὸν ἐλήφθη θάτερον
 δὲ κατηγορικόν, τὸ πρῶτον ἔσται σχῆμα. τὸ μὲν
 γὰρ Γ παντὶ τῷ Α τὸ δὲ Β οὐδενὶ τῷ Γ, ὥστ'
 25 οὐδενὶ τῷ Α τὸ Β· οὐδ' ἄρα τὸ Α τῷ Β. διὰ μὲν
 οὖν τοῦ συμπεράσματος καὶ τῆς μιᾶς προτάσεως
 οὐ γίγνεται συλλογισμός, προσληφθείσης δ' ἑτέρας
 ἔσται.

Ἦν δὲ μὴ καθόλου ὁ συλλογισμὸς ἢ, ἢ μὲν ἐν
 ὅλῳ πρότασις οὐ δείκνυται (διὰ τὴν αὐτὴν αἰτίαν
 30 ἢνπερ εἵπομεν καὶ πρότερον), ἢ δ' ἐν μέρει δεί-
 κνυται ὅταν ἢ τὸ καθόλου κατηγορικόν. ὑπαρχέτω
 γὰρ τὸ Α παντὶ τῷ Β τῷ δὲ Γ μὴ παντί· συμπέ-
 ρασμα ΒΓ. εἰάν οὖν ληφθῇ τὸ Β παντὶ τῷ Α τῷ
 δὲ Γ οὐ παντί, τὸ Α τινὶ τῷ Γ οὐχ ὑπάρξει (μέσον
 Β). εἰ δ' ἔστιν ἡ καθόλου στερητική, οὐ δειχθή-
 σεται ἢ ΑΓ πρότασις ἀντιστραφέντος τοῦ ΑΒ·
 35 συμβαίνει γὰρ ἢ ἀμφοτέρας ἢ τὴν ἑτέραν πρότασις
 γίγνεσθαι ἀποφατικήν, ὥστ' οὐκ ἔσται συλλογι-
 σμός. ἀλλ' ὁμοίως δειχθήσεται ὡς καὶ ἐπὶ τῶν

¹ τῷ δὲ Γ μηδενί Cm et in marg. B¹: om. cet.

PRIOR ANALYTICS, II. VI

cannot be proved by this means, but the negative ^{second} statement can. The affirmative statement cannot be ^{figure.} proved because the premisses are not both affirmative; for the conclusion is negative, and the affirmative statement can only be proved, as we have seen, by premisses which are both affirmative. The negative statement is proved as follows. Let A apply to all B, but to no C. The conclusion is that B applies to no C. Then if B is assumed to apply to all A, A must apply to no C; for we get the second figure with B as the middle term. If AB has been assumed as negative and the other premiss as affirmative, we shall have the first figure; for C applies to all A, and B to no C, so that B applies to no A, and therefore A to no B. Thus we get no syllogism by means of the conclusion and one premiss, but we shall have a syllogism if we assume a further premiss.^a

If the syllogism is not universal, the universal premiss cannot be proved, for the same reason which we have explained above ^b; but the particular premiss can be proved when the universal statement is affirmative. Let A apply to all B, but not to all C. The conclusion is BC. Then if B is assumed to apply to all A, but not to all C, A will not apply to some C. The middle term is B. If, however, the universal premiss is negative, the premiss AC cannot be proved by the conversion of AB; for it follows that either one or both of the premisses become negative, so that there will be no syllogism. It can, however, be proved in a similar way to that which was used in the case of universal syllogisms: *i.e.*, if it is assumed that

^a *i.e.* the converse of the conclusion.

^b 58 a 36 ff.

58 b

καθόλου, ἐὰν ληφθῇ ὡς τὸ Β τινὶ μὴ ὑπάρχει τὸ Α τινὶ ὑπάρχειν.

VII. Ἐπὶ δὲ τοῦ τρίτου σχήματος ὅταν μὲν
 40 ἀμφότεραι αἱ προτάσεις καθόλου ληφθῶσιν, οὐκ
 ἐνδέχεται δεῖξαι δι' ἀλλήλων· τὸ μὲν γὰρ καθόλου
 59 δείκνυται διὰ τῶν καθόλου, τὸ δ' ἐν τούτῳ συμ-
 πέρασμα αἰεὶ κατὰ μέρος, ὥστε φανερόν ὅτι ὅλως
 οὐκ ἐνδέχεται δεῖξαι διὰ τούτου τοῦ σχήματος τὴν
 καθόλου πρότασιν. ἐὰν δ' ἡ μὲν ἢ καθόλου ἢ δ'
 ἐν μέρει, ποτὲ μὲν ἔσται ποτὲ δ' οὐκ ἔσται. ὅταν
 5 μὲν οὖν ἀμφότεραι κατηγορικαὶ ληφθῶσι καὶ τὸ
 καθόλου γένηται πρὸς τῷ ἐλάττωι ἄκρῳ, ἔσται,
 ὅταν δὲ πρὸς θατέρῳ, οὐκ ἔσται. ὑπαρχέτω γὰρ
 τὸ Α παντὶ τῷ Γ τὸ δὲ Β τινὶ· συμπέρασμα τὸ
 ΑΒ. ἐὰν οὖν ληφθῇ τὸ Γ παντὶ τῷ Α ὑπάρχειν,
 τὸ μὲν Γ δέδεικται τινὶ τῷ Β ὑπάρχον, τὸ δὲ Β τινὶ
 10 τῷ Γ οὐ δέδεικται. καίτοι ἀνάγκη, εἰ τὸ Γ τινὶ τῷ
 Β, καὶ τὸ Β τινὶ τῷ Γ ὑπάρχειν. ἀλλ' οὐ ταυτόν
 ἐστὶ τόδε τῷδε καὶ τόδε τῷδε ὑπάρχειν, ἀλλὰ
 προσληπτέον εἰ τόδε τινὶ τῷδε, καὶ θάτερον τινὶ
 τῷδε· τούτου δὲ ληφθέντος οὐκέτι γίνεταί ἐκ τοῦ
 συμπεράσματος καὶ τῆς ἐτέρας προτάσεως ὁ
 15 συλλογισμός. εἰ δὲ τὸ μὲν Β παντὶ τῷ Γ τὸ δὲ Α
 τινὶ τῷ Γ, ἔσται δεῖξαι τὸ ΑΓ ὅταν ληφθῇ τὸ μὲν
 Γ παντὶ τῷ Β ὑπάρχειν τὸ δὲ Α τινὶ. εἰ γὰρ τὸ Γ
 παντὶ τῷ Β τὸ δὲ Α τινὶ τῷ Β, ἀνάγκη τὸ Α τινὶ
 τῷ Γ ὑπάρχειν (μέσον τὸ Β).

Καὶ ὅταν ἢ ἡ μὲν κατηγορική ἢ δὲ στερητική,
 20 καθόλου δ' ἡ κατηγορική, δειχθήσεται ἡ ἐτέρα.
 ὑπαρχέτω γὰρ τὸ Β παντὶ τῷ Γ, τὸ δὲ Α τινὶ
 μὴ ὑπαρχέτω· συμπέρασμα ὅτι τὸ Α τινὶ τῷ Β οὐχ

PRIOR ANALYTICS, II. VI-VII

A applies to some of that to some of which B does not apply.^a

VII. In the third figure, when both premisses are assumed as universal, reciprocal proof is impossible ; for the universal statement can only be proved by means of universal statements, and in this figure the conclusion is always particular ; so that it is evident that the universal premiss cannot be proved at all by means of this figure. If, however, one premiss is universal and the other particular, reciprocal proof will sometimes be possible and sometimes not. When both premisses are assumed as affirmative, and the universal relation is attached to the minor extreme, it will be possible ; but not when the universal relation is attached to the other extreme. For let A apply to all C, and B to some C. The conclusion is AB. Then if C is assumed to apply to all A, it is proved that C applies to some B, but not that B applies to some C. It may be urged that if C applies to some B, B must also apply to some C ; but ' X applies to Y ' is not the same as ' Y applies to X ' ; we must make the further assumption that if X applies to some Y, Y also applies to some X ; and if we assume this, the syllogism is no longer effected by means of the conclusion and the other premiss. But if B applies to all C, and A to some C, the premiss AC can be proved after assuming that C applies to all and A to some B. For if C applies to all B, and A to some B, A must apply to some B. B is the middle term.

Reciprocal
proof in
the third
figure.

When one premiss is affirmative and the other negative, and the affirmative premiss is universal, the other can be proved. For let B apply to all C, and let A not apply to some C. The conclusion is that A

^a Cf. 58 a 29, b 9.

59 a

ὑπάρχει. ἐὰν οὖν προσληφθῇ τὸ Γ παντὶ τῷ Β ὑπάρχειν, ἀνάγκη τὸ Α τινὶ τῷ Γ μὴ ὑπάρχειν (μέσον τὸ Β). ὅταν δ' ἡ στερητική καθόλου γένηται οὐ
 25 δέικνυται ἢ ἑτέρα, εἰ μὴ ὥσπερ ἐπὶ τῶν πρότερον, ἐὰν ληφθῇ ὡς τοῦτο τινὶ μὴ ὑπάρχει θάτερον τινὶ ὑπάρχειν, ὅσον εἰ τὸ μὲν Α μηδενὶ τῷ Γ τὸ δὲ Β τινὶ· συμπέρασμα ὅτι τὸ Α τινὶ τῷ Β οὐχ ὑπάρχει. ἐὰν οὖν ληφθῇ ὡς τὸ Α τινὶ μὴ ὑπάρχει τὸ Γ τινὶ ὑπάρχειν, ἀνάγκη τὸ Γ τινὶ τῶν Β ὑπάρχειν.
 30 ἄλλως δ' οὐκ ἔστιν ἀντιστρέφοντα τὴν καθόλου πρότασιν δεῖξαι τὴν ἑτέραν· οὐδαμῶς γὰρ ἔσται συλλογισμός.

Φανερόν οὖν ὅτι ἐν μὲν τῷ πρώτῳ σχήματι ἡ δι' ἀλλήλων δεῖξις διὰ τε τοῦ τρίτου καὶ διὰ τοῦ πρώτου γίνεται σχήματος. κατηγορικοῦ μὲν γὰρ
 35 ὁῖτος τοῦ συμπερασματος διὰ τοῦ πρώτου, στερητικοῦ δὲ διὰ τοῦ ἐσχάτου· λαμβάνεται γὰρ ὡς τοῦτο μηδενὶ θάτερον παντὶ ὑπάρχειν. ἐν δὲ τῷ μέσῳ καθόλου μὲν ὄντος τοῦ συλλογισμοῦ δι' αὐτοῦ τε καὶ διὰ τοῦ πρώτου σχήματος, ὅταν δ' ἐν μέρει, δι' αὐτοῦ τε καὶ τοῦ ἐσχάτου. ἐν δὲ τῷ τρίτῳ δι'
 40 αὐτοῦ πάντες. φανερόν δὲ καὶ ὅτι ἐν τῷ τρίτῳ καὶ τῷ μέσῳ οἱ μὴ δι' αὐτῶν γιγνόμενοι συλλογισμοὶ ἢ οὐκ εἰσὶ κατὰ τὴν κύκλῳ δεῖξιν ἢ ἀτελεῖς.

59 b

VIII. Τὸ δ' ἀντιστρέφειν ἐστὶ τὸ μετατιθέντα τὸ συμπέρασμα ποιεῖν τὸν συλλογισμόν ὅτι ἢ τὸ ἄκρον τῷ μέσῳ οὐχ ὑπάρξει ἢ τοῦτο τῷ τελευταίῳ. ἀνάγκη γὰρ τοῦ συμπερασματος ἀντιστραφέντος
 5 καὶ τῆς ἑτέρας μενούσης προτάσεως ἀναιρεῖσθαι

* 58 a 29, b 9, 37.

* Cf. 58 b 22-27, 59 a 6-14.

* i.e. changing its quality, with or without change of

PRIOR ANALYTICS, II. VII-VIII

does not apply to some B. Then if it is further assumed that C applies to all B, it must follow that A does not apply to some C. The middle term is B. But when the negative premiss is universal, the other cannot be proved, unless, as in the previous examples,^a it is assumed that where one term does not apply to some, the other does apply to some. *E.g.*, if it is assumed that A applies to no C, and B to some C, the conclusion is that A does not apply to some B. Then if it is assumed that C applies to some of that to some of which A does not apply, C must apply to some B. It is impossible in any other way by converting the universal premiss to prove the other, for in no case will there be a syllogism.

Thus it is evident that in the first figure reciprocal proof is effected both by the third and by the first figure ; by the first when the conclusion is affirmative, and by the last when it is negative ; for it is assumed that where one term applies to none, the other applies to all. In the middle figure, when the syllogism is universal, reciprocal proof is possible both by that figure itself and by the first figure ; when it is particular, both by that figure and by the last. In the third figure all proofs are by the figure itself. It is also evident that in the third and middle figures such syllogisms as are not effected by these figures themselves are either incompatible with circular proof or imperfect.^b

VIII. Converting a syllogism consists in reversing^c the conclusion and so constructing the syllogism that either the major extreme will not apply to the middle or the latter will not apply to the last term. For if the conclusion is converted and one premiss remains

The figures used in reciprocal proof.

Conversion of syllogisms.

quantity. The same meaning attaches (in this and the two following chapters) to 'converting.'

59 b

τὴν λοιπὴν· εἰ γὰρ ἔσται, καὶ τὸ συμπέρασμα ἔσται. διαφέρει δὲ τὸ ἀντικειμένως ἢ ἐναντίως ἀντιστρέφειν τὸ συμπέρασμα· οὐ γὰρ ὁ αὐτὸς γίγνεται συλλογισμὸς ἐκατέρως ἀντιστραφέντος· δῆλον δὲ τοῦτ' ἔσται διὰ τῶν ἐπομένων (λέγω δ' ἀντικεῖσθαι
 10 μὲν τὸ παντὶ τῷ οὐ παντὶ καὶ τὸ τινὶ τῷ οὐδενί, ἐναντίως δὲ τὸ παντὶ τῷ οὐδενί καὶ τὸ τινὶ τῷ οὐ τινὶ ὑπάρχειν).

Ἐστω γὰρ δεδειγμένον τὸ Α κατὰ τοῦ Γ διὰ μέσου τοῦ Β. εἰ δὴ τὸ Α ληφθεῖη μηδενὶ τῷ Γ ὑπάρχειν τῷ δὲ Β παντί, οὐδενὶ τῷ Γ ὑπάρξει τὸ Β. καὶ εἰ τὸ μὲν Α μηδενὶ τῷ Γ τὸ δὲ Β παντὶ τῷ Γ,
 15 τὸ Α οὐ παντὶ τῷ Β καὶ οὐχὶ ὅλως οὐδενί· οὐ γὰρ ἐδείκνυτο τὸ καθόλου διὰ τοῦ ἐσχάτου σχήματος. ὅλως δὲ τὴν πρὸς τῷ μείζονι ἄκρῳ πρότασιν οὐκ ἔστιν ἀνασκευάσαι καθόλου διὰ τῆς ἀντιστροφῆς· αἰεὶ γὰρ ἀναιρεῖται διὰ τοῦ τρίτου σχήματος· ἀνάγκη γὰρ πρὸς τὸ ἐσχάτον ἄκρον ἀμφοτέρας λαβεῖν τὰς
 20 προτάσεις.

Καὶ εἰ στερητικὸς ὁ συλλογισμὸς ὡσαύτως. δεδείχθω γὰρ τὸ Α μηδενὶ τῷ Γ ὑπάρχειν διὰ τοῦ Β. οὐκοῦν ἐὰν ληφθῇ τὸ Α τῷ Γ παντὶ ὑπάρχειν τῷ δὲ Β μηδενί, οὐδενὶ τῶν Γ τὸ Β ὑπάρξει· καὶ εἰ τὸ Α καὶ τὸ Β παντὶ τῷ Γ, τὸ Α τινὶ τῷ Β· ἄλλ' οὐδενὶ ὑπῆρχεν.

25 Ἐὰν δ' ἀντικειμένως ἀντιστραφῇ τὸ συμπέρασμα, καὶ οἱ συλλογισμοὶ ἀντικείμενοι καὶ οὐ καθόλου ἔσονται· γίγνεται γὰρ ἡ ἑτέρα πρότασις ἐν μέρει, ὥστε καὶ τὸ συμπέρασμα ἔσται κατὰ μέρος. ἔστω γὰρ κατηγορικὸς ὁ συλλογισμὸς, καὶ ἀντιστρέφε-

* Cf. *De Interp.* 17 b 16 ff.

• 29 a 16.

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as before, the remaining premiss must be invalidated ; for if it is to be valid, the conclusion must also be valid. It makes a difference, however, whether we reverse the conclusion in the contradictory or in the contrary sense ; for we do not get the same syllogism by both modes of reversal. This will be clear from the following explanation. (By the *contradictory* of 'applying to all' I mean 'not applying to all,' and of 'applying to some' 'applying to none' ; whereas the *contrary* of 'applying to all' is 'applying to none,' and of 'applying to some' is 'not applying to some.')^a

Contradictory and contrary conversion.

Let us take it as proved, by means of the middle term B, that A is stated of all C. Then supposing that A is assumed to apply to no C, but to all B, B will apply to no C. And if A applies to no C, but B applies to all C, A will not apply to all B ; but it does not at all follow that it will apply to no B, for, as we have seen,^b the universal statement cannot be proved by the last figure. In general it is impossible to invalidate the major premiss universally by conversion, because the refutation is always by the third figure, since we must assume both premisses in relation to the last extreme.

First figure.
A. Universal syllogisms.
(1) Contrary conversion.

The same also holds if the syllogism is negative. Let it be proved, by means of the middle term B, that A applies to no C. Then if A is assumed to apply to all C, but to no B, B will apply to no C. And if A and B apply to all C, A will apply to some B ; but *ex hypothesi* it applies to none.

If, however, the conclusion is converted in the contradictory sense, the syllogisms will also be contradictory, and not universal ; for one premiss becomes particular, and so the conclusion will also be particular. For let the syllogism be affirmative, and

(2) Contradictory conversion.

59 b

30 σθω οὕτως. οὐκοῦν εἰ τὸ Α οὐ παντὶ τῷ Γ τῷ
 δὲ Β παντί, τὸ Β οὐ παντὶ τῷ Γ· καὶ εἰ τὸ μὲν Α
 μὴ παντὶ τῷ Γ τὸ δὲ Β παντί, τὸ Α οὐ παντὶ τῷ Β.
 ὁμοίως δὲ καὶ εἰ στερητικὸς ὁ συλλογισμὸς. εἰ
 γὰρ τὸ Α τινὶ τῷ Γ ὑπάρχει τῷ δὲ Β μηδενί, τὸ
 Β τινὶ τῷ Γ οὐχ ὑπάρξει, οὐχ ἀπλῶς οὐδενί· καὶ
 35 εἰ τὸ μὲν Α τῷ Γ τινὶ τὸ δὲ Β παντί, ὥσπερ ἐν
 ἀρχῇ ἐλήφθη, τὸ Α τινὶ τῷ Β ὑπάρξει.

Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν ὅταν μὲν
 ἀντικειμένως ἀντιστρέφῃται τὸ συμπέρασμα· ἀναι-
 ροῦνται ἀμφότεραι αἱ προτάσεις, ὅταν δ' ἐναντίως
 40 οὐδετέρα. οὐ γὰρ ἔτι συμβαίνει, καθάπερ ἐν τοῖς
 καθόλου, ἀναιρεῖν ἐλλείποντος τοῦ συμπεράσματος
 60 α κατὰ τὴν ἀντιστροφὴν, ἀλλ' οὐδ' ὅλως ἀναιρεῖν.
 δεδείχθω γὰρ τὸ Α κατὰ τινὸς τοῦ Γ. οὐκοῦν ἂν
 ληφθῇ τὸ Α μηδενὶ τῷ Γ ὑπάρχειν τὸ δὲ Β τινί,
 τὸ Α τῷ Β τινὶ οὐχ ὑπάρξει· καὶ εἰ τὸ Α μηδενὶ
 τῷ Γ τῷ δὲ Β παντί, οὐδενὶ τῷ Γ τὸ Β· ὥστ'
 5 ἀναιροῦνται ἀμφότεραι. ἐὰν δ' ἐναντίως ἀντι-
 στραφῇ, οὐδετέρα. εἰ γὰρ τὸ Α τινὶ τῷ Γ μὴ ὑπάρχει
 τῷ δὲ Β παντί, τὸ Β τινὶ τῷ Γ οὐχ ὑπάρξει. ἀλλ'
 οὕτω ἀναιρεῖται τὸ ἐξ ἀρχῆς, ἐνδέχεται γὰρ τινὶ
 ὑπάρχειν καὶ τινὶ μὴ ὑπάρχειν. τῆς δὲ καθόλου
 τῆς ΑΒ ὅλως οὐδὲ γίγνεται συλλογισμὸς· εἰ γὰρ
 10 τὸ μὲν Α τινὶ τῶν Γ μὴ ὑπάρχει τὸ δὲ Β τινὶ
 ὑπάρχει, οὐδετέρα καθόλου τῶν προτάσεων. ὁμοίως
 δὲ καὶ εἰ στερητικὸς ὁ συλλογισμὸς· εἰ μὲν γὰρ
 ληφθεῖη τὸ Α παντὶ τῷ Γ ὑπάρχειν, ἀναιροῦνται
 ἀμφότεραι, εἰ δὲ τινί, οὐδετέρα· ἀπόδειξις δ' ἡ
 αὕτη.

let it be converted in the sense just described. Then if A does not apply to all C, but applies to all B, B will not apply to all C. And if A does not apply to all C, but B does, A will not apply to all B. Similarly too if the syllogism is negative. For if A applies to some C but to no B, B will not apply to some C; it will not apply absolutely to none. And if A applies to some and B to all C, as was originally assumed, A will apply to some B.

In the case of particular syllogisms, (1) when the conclusion is converted in the contradictory sense, both premisses are refuted; but (2) when it is converted in the contrary sense, neither premiss is refuted. For the result is no longer, as it was in the universal syllogisms, a refutation in which the conclusion after conversion lacks universality; on the contrary, there is no refutation at all. (1) Let it be proved that A is stated of some C. Then if A is assumed to apply to no C but to some B, A will not apply to some B. And if A applies to no C but to all B, B will apply to no C. Thus both premisses are refuted. But (2) if the conclusion is converted in the contrary sense, neither is refuted. For if A does not apply to some C, but applies to all B, B will not apply to some C. Yet the original assumption is not yet refuted, because it is possible to apply to some and yet not to apply to some. As for the universal premiss AB, no syllogism at all can be obtained to refute it; for if A does not and B does apply to some C, neither premiss is universal. Similarly too if the syllogism is negative. For if A is assumed to apply to all C, both premisses are refuted; but if to some C, neither is refuted. The proof is the same as before.

B. Particular syllogisms. Refutation is possible by contradictory, but not by contrary conversion.

60 a

15

IX. Ἐν δὲ τῷ δευτέρῳ σχήματι τὴν μὲν πρὸς τῷ μείζονι ἄκρῳ πρότασιν οὐκ ἔστιν ἀνελεῖν ἐναντίως, ὅποτερωσοῦν τῆς ἀντιστροφῆς γιγνομένης· αἰ γὰρ ἔσται τὸ συμπέρασμα ἐν τῷ τρίτῳ σχήματι, καθόλου δ' οὐκ ἦν ἐν τούτῳ συλλογισμός. τὴν δ' ἑτέραν ὁμοίως ἀναιρήσομεν τῇ ἀντιστροφῇ (λέγω δὲ
 20 τὸ ὁμοίως, εἰ μὲν ἐναντίως ἀντιστρέφεται, ἐναντίως, εἰ δ' ἀντικειμένως, ἀντικειμένως).

Ὑπαρχέτω γὰρ τὸ Α παντὶ τῷ Β τῷ δὲ Γ μηδενί· συμπέρασμα ΒΓ. εἰς οὖν ληφθῇ τὸ Β παντὶ τῷ Γ ὑπάρχειν καὶ τὸ ΑΒ μένη, τὸ Α παντὶ τῷ Γ ὑπάρξει· γίγνεται γὰρ τὸ πρῶτον σχῆμα. εἰ δὲ τὸ Β
 25 παντὶ τῷ Γ τὸ δὲ Α μηδενὶ τῷ Γ, τὸ Α οὐ παντὶ τῷ Β· σχῆμα τὸ ἔσχατον. εἰς δ' ἀντικειμένως ἀντιστραφῇ τὸ ΒΓ, ἢ μὲν ΑΒ ὁμοίως δειχθήσεται, ἢ δὲ ΑΓ ἀντικειμένως. εἰ γὰρ τὸ Β τινὶ τῷ Γ τὸ δὲ Α μηδενὶ τῷ Γ, τὸ Α τινὶ τῷ Β οὐχ ὑπάρξει.
 30 πάλιν εἰ τὸ Β τινὶ τῷ Γ τὸ δὲ Α παντὶ τῷ Β, τὸ Α τινὶ τῷ Γ, ὥστ' ἀντικειμένως γίγνεται ὁ συλλογισμός. ὁμοίως δὲ δειχθήσεται καὶ εἰ ἀνάπαλιν ἔχοιεν αἱ προτάσεις.

Εἰ δ' ἔστιν ἐπὶ μέρους ὁ συλλογισμός, ἐναντίως μὲν ἀντιστρεφόμενον τοῦ συμπεράσματος οὐδετέρα
 35 τῶν προτάσεων ἀναιρεῖται, καθάπερ οὐδ' ἐν τῷ πρῶτῳ σχήματι, ἀντικειμένως δ' ἀμφότεραι. κείσθω γὰρ τὸ Α τῷ μὲν Β μηδενὶ ὑπάρχειν τῷ δὲ Γ τινί· συμπέρασμα ΒΓ. εἰς οὖν τεθῇ τὸ Β τινὶ τῷ Γ ὑπάρχειν καὶ τὸ ΑΒ μένη, συμπέρασμα ἔσται ὅτι τὸ Α τινὶ τῷ Γ οὐχ ὑπάρχει. ἀλλ' οὐκ ἀνήρηται τὸ ἐξ ἀρχῆς· ἐνδέχεται γὰρ τινὶ ὑπάρχειν καὶ

* 29 a 16; cf. 59 b 15.

^b i.e. refuted.

IX. In the second figure, in whichever sense the conversion is effected, the major premiss cannot be refuted in the contrary sense ; for the conclusion will always be obtained in the third figure, and we have seen ^a that in it there is no universal syllogism. The other premiss, however, can be refuted in the same sense as the conversion. By 'in the same sense' I mean that if the conversion is contrary the refutation is in the contrary sense, and if contradictory, in the contradictory sense. Conversion in the second figure.

For example, let A apply to all B but to no C. The conclusion is BC. Then if B is assumed to apply to all C, and AB stands, A will apply to all C ; for we get the first figure. But if B applies to all C, and A to no C, A will not apply to all B. This is the last figure. If on the other hand BC is converted in the contradictory sense, AB will be proved ^b as before, but AC will be refuted by its contradictory. For if B applies to some C, and A to no C, A will not apply to some B ; and again if B applies to some C, and A to all B, A will apply to some C, so that we get a conclusion in the contrary sense. The proof will be similar also if the premisses are in the opposite relation. Universal syllogisms.

If, however, the syllogism is particular, when the conclusion is converted in the contrary sense, neither of the premisses is refuted, just as neither was refuted in the first figure ^c ; but when in the contradictory sense, both are refuted. For let it be supposed that A applies to no B but to some C. The conclusion is BC. Then if B is taken to apply to some C, and AB stands, the conclusion will be that A does not apply to some C. But the original premiss is not refuted ; for it is possible both to apply to some and not to Particular syllogisms.

^c 59 b 39—60 a 1, 60 a 5-14.

60 a

40 μὴ ὑπάρχειν. πάλιν εἰ τὸ Β τινὶ τῷ Γ καὶ τὸ Α
 τινὶ τῷ Γ, οὐκ ἔσται συλλογισμός· οὐδέτερον γὰρ
 60 b καθόλου τῶν εἰλημμένων· ὥστ' οὐκ ἀναιρεῖται τὸ
 ΑΒ. ἐὰν δ' ἀντικειμένως ἀντιστρέφηται, ἀναιροῦν-
 ται ἀμφότεραι. εἰ γὰρ τὸ Β παντὶ τῷ Γ τὸ δὲ Α
 μηδενὶ τῷ Β, οὐδενὶ τῷ Γ τὸ Α· ἦν δὲ τινί. πάλιν
 εἰ τὸ Β παντὶ τῷ Γ τὸ δὲ Α τινὶ τῷ Γ, τινὶ τῷ
 5 Β τὸ Α. ἡ αὐτὴ δ' ἀπόδειξις καὶ εἰ τὸ καθόλου
 κατηγορικόν.

Χ. Ἐπὶ δὲ τοῦ τρίτου σχήματος ὅταν μὲν ἐναν-
 τίως ἀντιστρέφηται τὸ συμπέρασμα, οὐδετέρα τῶν
 προτάσεων ἀναιρεῖται κατ' οὐδένα τῶν συλλογι-
 σμῶν, ὅταν δ' ἀντικειμένως, ἀμφότεραι καὶ ἐν
 10 ᾗπασιν. δεδείχθω γὰρ τὸ Α τινὶ τῷ Β ὑπάρχον,
 μέσον δ' εἰλήφθω τὸ Γ, ἔστωσαν δὲ καθόλου αἱ
 προτάσεις. οὐκοῦν ἐὰν ληθῇ τὸ Α τινὶ τῷ Β μὴ
 ὑπάρχειν τὸ δὲ Β παντὶ τῷ Γ, οὐ γίνεταί συλ-
 λογισμὸς τοῦ Α καὶ τοῦ Γ. οὐδ' εἰ τὸ Α τῷ μὲν
 Β τινὶ μὴ ὑπάρχει τῷ δὲ Γ παντί, οὐκ ἔσται τοῦ Β
 15 καὶ τοῦ Γ συλλογισμός. ὁμοίως δὲ δειχθήσεται
 καὶ εἰ μὴ καθόλου αἱ προτάσεις. ἡ γὰρ ἀμφοτέρας
 ἀνάγκη κατὰ μέρος εἶναι διὰ τῆς ἀντιστροφῆς, ἡ
 τὸ καθόλου πρὸς τῷ ἐλάττονι ἄκρῳ γίνεσθαι·
 οὕτω δ' οὐκ ἦν συλλογισμὸς οὗτ' ἐν τῷ πρώτῳ
 σχήματι οὗτ' ἐν τῷ μέσῳ.

Ἐὰν δ' ἀντικειμένως ἀντιστρέφηται,¹ αἱ προτά-
 20 σεις ἀναιροῦνται ἀμφότεραι. εἰ γὰρ τὸ Α μηδενὶ
 τῷ Β τὸ δὲ Β παντὶ τῷ Γ, τὸ Α οὐδενὶ τῷ Γ· πάλιν
 εἰ τὸ Α τῷ μὲν Β μηδενὶ τῷ δὲ Γ παντί, τὸ Β οὐδενὶ
 τῷ Γ. καὶ εἰ ἡ ἑτέρα μὴ καθόλου ὡσαύτως. εἰ

¹ ἀντιστρέφηται Philoponus (?), Jenkinson: ἀντιστρέφονται
 codd.

apply to some. Again, if B applies to some C and A to some C, there will be no syllogism ; for neither of the assumptions is universal. Thus AB is not refuted. If, however, the conclusion is converted in the contradictory sense, both premisses are refuted. For if B applies to all C and A to no B, A will apply to no C ; whereas before it applied to some. Again, if B applies to all C and A to some C, A will apply to some B. The proof will be the same too if the universal statement is affirmative.

X. In the third figure, when the conclusion is converted in the contrary sense, neither premiss is refuted in any syllogism ; but when in the contradictory sense, both are refuted in all syllogisms. For let it be proved that A applies to some B, and let C be assumed as the middle term, and let the premisses be universal. Then if A is assumed not to apply to some B, and B to apply to all C, we get no syllogism relating A and C. Again, if A does not apply to some B, but applies to all C, there will be no syllogism relating B and C. There will also be a similar proof if the premisses are not universal ; for either both premisses must be particular as the result of conversion, or the universal statement must become attached to the minor extreme ; and under these conditions there is no syllogism, as we have seen,^a either in the first or in the middle figure.

If, however, the conclusion is converted in the contradictory sense, both premisses are refuted. For if A applies to no B, and B to all C, A will apply to no C. Again, if A applies to no B but to all C, B will apply to no C. The same also holds if the other premiss is

Third figure.
Refutation
is not by
contrary
but only
by con-
tradictory
conversion.
(1) in
affirmative

^a 26 a 17-21, 27 a 4-12.

60 b

γὰρ τὸ Α μηδενὶ τῷ Β τὸ δὲ Β τινὶ τῷ Γ, τὸ Α
 25 τινὶ τῷ Γ οὐχ ὑπάρξει· εἰ δὲ τὸ Α τῷ μὲν Β μηδενὶ
 τῷ δὲ Γ παντί, οὐδενὶ τῷ Γ τὸ Β.

Ὁμοίως δὲ καὶ εἰ στερητικὸς ὁ συλλογισμὸς.
 δεδείχθω γὰρ τὸ Α τινὶ τῷ Β μὴ ὑπάρχον, ἔστω
 δὲ κατηγορικὸν μὲν τὸ ΒΓ ἀποφατικὸν δὲ τὸ ΑΓ·
 οὕτω γὰρ ἐγίγνετο ὁ συλλογισμὸς. ὅταν μὲν οὖν
 τὸ ἐναντίον ληφθῇ τῷ συμπεράσματι, οὐκ ἔσται
 30 συλλογισμὸς. εἰ γὰρ τὸ Α τινὶ τῷ Β τὸ δὲ Β παντί
 τῷ Γ, οὐκ ἦν συλλογισμὸς τοῦ Α καὶ τοῦ Γ. οὐδ'
 εἰ τὸ Α τινὶ τῷ Β τῷ δὲ Γ μηδενί, οὐκ ἦν τοῦ Β
 καὶ τοῦ Γ συλλογισμὸς· ὥστε οὐκ ἀναιροῦνται αἱ
 προτάσεις. ὅταν δὲ τὸ ἀντικείμενον, ἀναιροῦνται.

35 εἰ γὰρ τὸ Α παντί τῷ Β καὶ τὸ Β τῷ Γ, τὸ Α
 παντί τῷ Γ· ἀλλ' οὐδενὶ ὑπῆρχεν. πάλιν εἰ τὸ Α
 παντί τῷ Β τῷ δὲ Γ μηδενί, τὸ Β οὐδενὶ τῷ Γ·
 ἀλλὰ παντί ὑπῆρχεν. ὁμοίως δὲ δείκνυται καὶ εἰ
 μὴ καθόλου εἰσὶν αἱ προτάσεις. γίνεταί γὰρ τὸ
 ΑΓ καθόλου τε καὶ στερητικόν, θάτερον δ' ἐπὶ
 μέρους καὶ κατηγορικόν. εἰ μὲν οὖν τὸ Α παντί
 40 τῷ Β τὸ δὲ Β τινὶ τῷ Γ, τὸ Α τινὶ τῷ Γ συμβαίνει·
 ἀλλ' οὐδενὶ ὑπῆρχεν. πάλιν εἰ τὸ Α παντί τῷ Β

61 a τῷ δὲ Γ μηδενί, τὸ Β οὐδενὶ τῷ Γ· ἔκειτο δὲ τινί.
 εἰ δὲ τὸ Α τινὶ τῷ Β καὶ τὸ Β τινὶ τῷ Γ,
 οὐ γίνεταί συλλογισμὸς· οὐδ' εἰ τὸ Α τινὶ τῷ Β
 τῷ δὲ Γ μηδενί, οὐδ' οὕτως. ὥστ' ἐκείνως μὲν
 ἀναιροῦνται, οὕτω δ' οὐκ ἀναιροῦνται αἱ προτάσεις.

6 Φανερόν οὖν διὰ τῶν εἰρημένων πῶς ἀντιστρεφο-
 μένου τοῦ συμπεράσματος ἐν ἐκάστῳ σχήματι
 γίνεταί συλλογισμὸς, καὶ πότ' ἐναντίως τῇ προ-

not universal. For if A applies to no B, and B to some C, A will not apply to some C. And if A applies to no B, but to all C, B will apply to no C.

Similarly too if the syllogism is negative. Let it be proved that A does not apply to some B, and let BC be affirmative and AC negative ; for this, as we have seen,^a is how the syllogism is effected. Then when the contrary of the conclusion is assumed, there will be no syllogism. For if A applies to some B, and B to all C, there is no syllogism, as we have seen,^b relating A and C. Also if A applies to some B, but to no C, there is no syllogism, as we have seen,^c relating B and C. Thus the premisses are not refuted. But when the contradictory of the conclusion is assumed, they are refuted. For if A applies to all B, and B to C, A will apply to all C ; whereas before it applied to none. Again, if A applies to all B, but to no C, B will apply to no C ; whereas before it applied to all. There is a similar proof also if the premisses are not universal ; for AC becomes both universal and negative, and the other statement particular and affirmative. Thus if A applies to all B, and B to some C, it follows that A applies to some C ; whereas before it applied to none. Again, if A applies to all B, but to no C, B will apply to no C ; but the assumption was that it applies to some. If, however, A applies to some B, and B to some C, we get no syllogism ; nor do we if A applies to some B but to no C. Thus in the former case the premisses are refuted, but in the latter they are not.

Thus it is evident from the foregoing account (1) how syllogism is effected in each figure when the conclusion is converted, (2) in what circumstances the

(2) in negative syllogisms.

Summary of the results obtained in chs. viii.-x.

^b 26 a 30-36.

^c 27 b 6-8.

61 a

- τάσει καὶ πότε ἀντικειμένως, καὶ ὅτι ἐν μὲν τῷ
 πρώτῳ σχήματι διὰ τοῦ μέσου καὶ τοῦ ἐσχάτου
 γίνονται οἱ συλλογισμοί, καὶ ἡ μὲν πρὸς τῷ
 10 ἐλάττονι ἄκρῳ αἰεὶ διὰ τοῦ μέσου ἀναιρεῖται, ἡ δὲ
 πρὸς τῷ μείζονι διὰ τοῦ ἐσχάτου· ἐν δὲ τῷ δευτέρῳ
 διὰ τοῦ πρώτου καὶ τοῦ ἐσχάτου, καὶ ἡ μὲν πρὸς
 τῷ ἐλάττονι ἄκρῳ αἰεὶ διὰ τοῦ πρώτου σχήματος,
 ἡ δὲ πρὸς τῷ μείζονι διὰ τοῦ ἐσχάτου· ἐν δὲ τῷ
 τρίτῳ διὰ τοῦ πρώτου καὶ διὰ τοῦ μέσου, καὶ ἡ
 15 μὲν πρὸς τῷ μείζονι διὰ τοῦ πρώτου αἰεὶ, ἡ δὲ πρὸς
 τῷ ἐλάττονι διὰ τοῦ μέσου.

XI. Τί μὲν οὖν ἐστὶ τὸ ἀντιστρέφειν καὶ πῶς
 ἐν ἐκάστῳ σχήματι καὶ τίς γίνεταί συλλογισμός,
 φανερόν.

- Ὁ δὲ διὰ τοῦ ἀδυνάτου συλλογισμὸς δεί-
 20 κνυται μὲν ὅταν ἡ ἀντίφασις τεθῇ τοῦ συμπερά-
 σματος καὶ προσληφθῇ ἄλλη πρότασις, γίνεταί δ'
 ἐν ᾧ πασι τοῖς σχήμασιν· ὁμοιον γάρ ἐστι τῇ ἀντι-
 στροφῇ, πλὴν διαφέρει τοσοῦτον ὅτι ἀντιστρέφεται
 μὲν γεγενημένου συλλογισμοῦ καὶ εἰλημμένων
 ἀμφοῖν τῶν προτάσεων, ἀπάγεται δ' εἰς ἀδύνατον
 25 οὐ προομολογηθέντος τοῦ ἀντικειμένου πρότερον,
 ἀλλὰ φανεροῦ ὄντος ὅτι ἀληθές· οἱ δ' ὅροι ὁμοίως
 ἔχουσιν ἐν ἀμφοῖν, καὶ ἡ αὐτὴ λήψις ἀμφοτέρων.
 οἷον εἰ τὸ Α τῷ Β παντὶ ὑπάρχει, μέσον δὲ τὸ Γ,
 εἰ ὑποτεθῇ τὸ Α ἢ μὴ παντὶ ἢ μηδενὶ τῷ Β
 ὑπάρχειν, τῷ δὲ Γ παντί, ὅπερ ἦν ἀληθές, ἀνάγκη
 30 τὸ Γ τῷ Β ἢ μηδενὶ ἢ μὴ παντὶ ὑπάρχειν. τοῦτο
 δ' ἀδύνατον, ὥστε ψεῦδος τὸ ὑποτεθέν· ἀληθές ἄρα
 τὸ ἀντικείμενον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων

* i.e. the conclusion whose contradictory is assumed as a
 premiss for the process of reduction.

conclusion is the contrary and in what the contradictory of the original premiss, and (3) that in the first figure the syllogisms are effected by means of the middle and last figures, and the minor premiss is always refuted by the middle figure and the major by the last; in the second figure they are effected by the first and the last, and the minor premiss is always refuted by the first and the major by the last; and in the third figure the syllogisms are effected by the first and middle figures, and the major premiss is always refuted by the first and the minor by the middle figure.

XI. Thus it is evident what conversion is, and how it is effected in each figure, and what the resulting syllogism is.

A syllogism *per impossibile* is proved by positing the contradictory of the conclusion and assuming an additional premiss. It is effected in all three figures. It is similar to conversion, but differs from it to this extent: that whereas we convert after a syllogism has been effected and both premisses have been assumed, when we reduce *ad impossibile* the contradictory statement ^a is not first explicitly admitted, but is manifestly true. The terms, however, are similarly related in both, and the method of assumption is the same for both. *E.g.*, if A applies to all B, and C is the middle term, if we suppose that A does not apply to all or applies to none of B, but applies to all C, which is *ex hypothesi* true, C must apply to none or not apply to all of B. But this is impossible; therefore the supposition was false. Thus the opposite ^b is true. Similarly too in the other figures;

Proof *per impossibile* compared with conversion.

^b *i.e.* the contradictory.

61 a

σχημάτων· ὅσα γὰρ ἀντιστροφὴν δέχεται, καὶ τὸν
διὰ τοῦ ἀδυνάτου συλλογισμόν.

- Τὰ μὲν οὖν ἄλλα προβλήματα πάντα δείκνυται
 25 διὰ τοῦ ἀδυνάτου ἐν πᾶσι τοῖς σχήμασι, τὸ δὲ
 καθόλου κατηγορικὸν ἐν μὲν τῷ μέσῳ καὶ τῷ τρίτῳ
 δείκνυται, ἐν δὲ τῷ πρώτῳ οὐ δείκνυται. ὑποκεί-
 σθω γὰρ τὸ Α τῷ Β μὴ παντὶ ἢ μηδενὶ ὑπάρχειν, καὶ
 προσειλήθω ἄλλη πρότασις ὅποτερωθενοῦν, εἴτε
 40 τῷ Α παντὶ ὑπάρχειν τὸ Γ εἴτε τὸ Β παντὶ τῷ Δ·
 οὕτω γὰρ ἂν εἴη τὸ πρῶτον σχῆμα. εἰ μὲν οὖν
 ὑπόκειται μὴ παντὶ ὑπάρχειν τὸ Α τῷ Β, οὐ γί-
 61 νεται συλλογισμὸς ὅποτερωθενοῦν τῆς προτάσεως
 λαμβανομένης, εἰ δὲ μηδενί, ὅταν μὲν ἡ ΒΔ προσ-
 ληφθῇ, συλλογισμὸς μὲν ἔσται τοῦ ψεύδους, οὐ
 δείκνυται δὲ τὸ προκείμενον. εἰ γὰρ τὸ Α μηδενὶ
 τῷ Β τὸ δὲ Β παντὶ τῷ Δ, τὸ Α οὐδενὶ τῷ Δ.
 6 τοῦτο δ' ἔστω ἀδύνατον· ψεῦδος ἄρα τὸ μηδενὶ τῷ
 Β τὸ Α ὑπάρχειν. ἀλλ' οὐκ εἰ τὸ μηδενὶ ψεῦδος τὸ
 παντὶ ἀληθές. ἐὰν δ' ἡ ΓΑ προσληφθῇ, οὐ γίγνεται
 συλλογισμὸς, οὐδ' ὅταν ὑποτεθῇ μὴ παντὶ τῷ Β
 τὸ Α ὑπάρχειν· ὥστε φανερόν ὅτι τὸ παντὶ ὑπάρχειν
 10 οὐ δείκνυται ἐν τῷ πρώτῳ σχήματι διὰ τοῦ
 ἀδυνάτου.

Τὸ δέ γε τινὶ καὶ τὸ μηδενὶ καὶ μὴ παντὶ δεί-
 κνυται. ὑποκείσθω γὰρ τὸ Α μηδενὶ τῷ Β ὑπάρ-
 χειν, τὸ δὲ Β εἰλήθω παντὶ ἢ τινὶ τῷ Γ. οὐκοῦν
 ἀνάγκη τὸ Α μηδενὶ ἢ μὴ παντὶ τῷ Γ ὑπάρχειν.
 τοῦτο δ' ἀδύνατον (ἔστω γὰρ ἀληθές καὶ φανερόν
 15 ὅτι παντὶ ὑπάρχει τῷ Γ τὸ Α), ὥστ' εἰ τοῦτο
 ψεῦδος, ἀνάγκη τὸ Α τινὶ τῷ Β ὑπάρχειν. ἐὰν δὲ

for all examples which admit of conversion admit also of inference *per impossibile*.

All other propositions are demonstrable *per impossibile* in all three figures, but the universal affirmative, though demonstrable in the middle and third figures, is not demonstrable in the first. Let us suppose that A does not apply to all, or applies to none, of B; and let us also assume another premiss relating to either term, either that C applies to all A or that B applies to all D; for in this way we shall have the first figure. Now if we have supposed that A does not apply to all B, we get no syllogism, to whichever of the two terms the assumed premiss refers; but if we have supposed that A applies to no B, (1) when BD is further assumed, although we can argue to a false conclusion, the point to be proved is not demonstrated. For if A applies to no B, and B to all D, A will apply to no D. Let this be impossible. Then it is false that A applies to no B. But if 'A applies to no B' is false, it does not follow that 'A applies to all B' is true. (2) And if CA is further assumed, we get no syllogism, just as we get none when A is assumed not to apply to all B. Thus it is evident that the universal affirmative proposition is not demonstrable *per impossibile* in the first figure.

Universal affirmative propositions cannot be proved by reduction in the first figure.

The universal negative proposition, however, and the particular, whether affirmative or negative, are demonstrable. Let A be assumed to apply to no B, and let B be taken to apply to all or some of C. Then it necessarily follows that A applies to none, or does not apply at all, of C. But this is impossible (for let it be true and evident that A applies to all C); then if this is false, A must apply to some B.

Proof of the particular affirmative,

¹ ἔστω . . . τὸ A uncinis interpunxit Waitz.

61 b

πρὸς τῷ¹ Α ληφθῇ ἡ ἑτέρα πρότασις, οὐκ ἔσται
 συλλογισμός· οὐδ' ὅταν τὸ ἐναντίον τῷ συμπερά-
 σματι ὑποτεθῇ, ὡς τὸ τινὶ μὴ ὑπάρχειν. φανερόν
 οὖν ὅτι τὸ ἀντικείμενον ὑποθετέον.

Πάλιν ὑποκείσθω τὸ Α τινὶ τῷ Β ὑπάρχειν,
 20 εἰλήφθω δὲ τὸ Γ παντὶ τῷ Α. ἀνάγκη οὖν τὸ Γ
 τινὶ τῷ Β ὑπάρχειν. τοῦτο δ' ἔστω ἀδύνατον, ὥστε
 ψεῦδος τὸ ὑποτεθέν· εἰ δ' οὕτως, ἀληθὲς τὸ μηδενὶ
 ὑπάρχειν. ὁμοίως δὲ καὶ εἰ στερητικὸν ἐλήφθη τὸ
 ΓΑ. εἰ δ' ἡ πρὸς τῷ Β εἰληπται πρότασις, οὐκ
 ἔσται συλλογισμός. εἰ δὲ τὸ ἐναντίον ὑποτεθῇ,
 25 συλλογισμός μὲν ἔσται καὶ τὸ ἀδύνατον, οὐ δει-
 κνυται δὲ τὸ προτεθέν. ὑποκείσθω γὰρ παντὶ τῷ
 Β τὸ Α ὑπάρχειν, καὶ τὸ Γ τῷ Α εἰλήφθω παντί.
 οὐκοῦν ἀνάγκη τὸ Γ παντὶ τῷ Β ὑπάρχειν. τοῦτο
 δ' ἀδύνατον, ὥστε ψεῦδος τὸ παντὶ τῷ Β τὸ Α
 ὑπάρχειν. ἀλλ' οὕτω γε ἀναγκαῖον, εἰ μὴ παντί,
 30 μηδενὶ ὑπάρχειν. ὁμοίως δὲ καὶ εἰ πρὸς τῷ Β
 ληφθῇ ἡ ἑτέρα πρότασις· συλλογισμός μὲν γὰρ
 ἔσται καὶ τὸ ἀδύνατον, οὐκ ἀναιρεῖται δ' ἡ ὑπόθεσις,
 ὥστε τὸ ἀντικείμενον ὑποθετέον.

Πρὸς δὲ τὸ μὴ παντὶ δεῖξαι ὑπάρχον τῷ Β τὸ Α
 ὑποθετέον παντὶ ὑπάρχειν· εἰ γὰρ τὸ Α παντὶ τῷ Β
 35 καὶ τὸ Γ παντὶ τῷ Α, τὸ Γ παντὶ τῷ Β· ὥστ' εἰ
 τοῦτο ἀδύνατον, ψεῦδος τὸ ὑποτεθέν. ὁμοίως δὲ
 καὶ εἰ πρὸς τῷ Β ἐλήφθη ἡ ἑτέρα πρότασις. καὶ
 εἰ στερητικὸν ἦν τὸ ΓΑ ὡσαύτως· καὶ γὰρ οὕτω
 γίνεταί συλλογισμός. εἰ δὲ πρὸς τῷ Β ἡ τὸ
 στερητικόν, οὐδὲν δείκνυται. εἰ δὲ μὴ παντὶ

¹ τῷ BC, Waitz: τὸ Α.

But if the other premiss assumed is attached to A, there will be no syllogism ; nor when the contrary of the conclusion is assumed, viz., that A does not apply to some B. Thus it is evident that we must assume the contradictory of the conclusion.

Again, let it be supposed that A applies to some B, and let C be assumed to apply to all A. Then C must apply to some B. Let this be impossible, so that the supposition is false. But if this is so, it is true that A applies to no B. Similarly too if the assumed premiss CA had been negative. But if the premiss attached to B is assumed, there will be no syllogism. If, however, the contrary proposition is assumed, there will be a syllogism and an argument *per impossibile*, but the proposition is not demonstrable. Let it be supposed that A applies to all B, and let C be assumed to apply to all A. Then C must apply to all B. But this is impossible ; and so it is false that A applies to all B. But it is not *ipso facto* necessary that if it does not apply to all, it applies to none. Similarly too supposing that the other premiss assumed is attached to B ; for there will be a syllogism and an argument *per impossibile*, but the hypothesis is not refuted. Therefore we must assume the contradictory of the conclusion.

To prove that A does not apply to all B we must suppose that it applies to all. For if A applies to all B, and C to all A, C will apply to all B ; so that if this is impossible, the supposition is false. Similarly too if the other premiss had been attached to B. The same also holds if CA has been taken as negative ; for in this way too we get a syllogism. But if the negative proposition is attached to B, there is no demonstration. If, however, we suppose, not that

of the
universal
negative,

and of the
particular
negative.

61 b

40 ἀλλὰ τινὶ ὑπάρχειν ὑποτεθῇ, οὐ δείκνυται ὅτι οὐ
 παιτὶ ἀλλ' ὅτι οὐδενί. εἰ γὰρ τὸ Α τινὶ τῷ Β τὸ
 62 α δὲ Γ παιτὶ τῷ Α, τινὶ τῷ Β τὸ Γ ὑπάρξει. εἰ οὖν
 τοῦτ' ἀδύνατον, ψεῦδος τὸ τινὶ ὑπάρχειν τῷ Β
 τὸ Α, ὥστ' ἀληθές τὸ μηδενί. τούτου δὲ δει-
 χθέντος προσαναιρεῖται τὸ ἀληθές· τὸ γὰρ Α τῷ Β
 τινὶ μὲν ὑπῆρχε, τινὶ δ' οὐχ ὑπῆρχεν. ἔτι οὐ παρὰ
 5 τὴν ὑπόθεσιν συμβαίνει τὸ ἀδύνατον· ψεῦδος γὰρ
 ἂν εἴη, εἴπερ ἐξ ἀληθῶν μὴ ἔστι ψεῦδος συλλογίσα-
 σθαι· νῦν δ' ἐστὶν ἀληθές, ὑπάρχει γὰρ τὸ Α τινὶ
 τῷ Β· ὥστ' οὐχ ὑποθετέον τινὶ ὑπάρχειν, ἀλλὰ
 παντί. ὁμοίως δὲ καὶ εἰ τινὶ μὴ ὑπάρχον τῷ Β τὸ
 10 Α δεικνύομεν· εἰ γὰρ ταῦτὸ τὸ τινὶ μὴ ὑπάρχειν
 καὶ μὴ παντὶ ὑπάρχειν, ἢ αὐτὴ ἀμφοῖν ἀπόδειξις.

Φανερόν οὖν ὅτι οὐ τὸ ἐναντίον ἀλλὰ τὸ ἀντικεί-
 μενον ὑποθετέον ἐν ᾧ πασι τοῖς συλλογισμοῖς· οὕτω
 γὰρ τὸ ἀναγκαῖον ἔσται καὶ τὸ ἀξίωμα ἔνδοξον. εἰ
 γὰρ κατὰ παντός ἡ φάσις ἢ ἀπόφασις, δειχθέντος
 15 ὅτι οὐχ ἡ ἀπόφασις, ἀνάγκη τὴν κατάφασιν ἀλη-
 θεύεσθαι· πάλιν εἰ μὴ τίθησιν ἀληθεύεσθαι τὴν
 κατάφασιν, ἔνδοξον τὸ ἀξιῶσαι τὴν ἀπόφασιν. τὸ
 δ' ἐναντίον οὐδετέρως ἀρμόττει ἀξιοῦν· οὔτε γὰρ
 ἀναγκαῖον, εἰ τὸ μηδενὶ ψεῦδος, τὸ παντὶ ἀληθές,
 οὔτ' ἔνδοξον ὥς εἰ θάτερον ψεῦδος, ὅτι θάτερον
 ἀληθές.

20 XII. Φανερόν οὖν ὅτι ἐν τῷ πρώτῳ σχήματι τὰ

A applies to all, but that it applies to some B, what is proved is not that it does not apply to all, but that it applies to none. For if A applies to some B, and C to all A, C will apply to some B. Then if this is impossible, it is false that A applies to some B, and therefore true that it applies to none. But by this proof the truth is refuted too ; for the supposition was that A applies to some and also does not apply to some B. Moreover the impossibility does not result from the hypothesis ; for if it did, the hypothesis would be false, since a false conclusion cannot be drawn from true premisses ; but actually it is true, because A applies to some B. Thus we must suppose, not that A applies to some B, but that it applies to all. Similarly too if we should try to prove that A does not apply to some B ; for since ' not to apply to some ' and ' not to apply to all ' are the same, the proof will be the same for both.

Thus it is evident that in all syllogisms we must suppose not the contrary but the contradictory of the conclusion ; for in this way we shall secure logical necessity, and our claim will be generally admitted. For if either the assertion or the negation of a given predicate is true of every given subject, then when it is proved that the negation is not true, the affirmation must be true ; and on the other hand if it is not maintained that the affirmation is true, the claim that the negation is true will be generally admitted. But the claim that the contrary statement is true meets neither requirement ; for it is not a necessary consequence that if ' it applies to none ' is false, ' it applies to all ' is true, nor is it generally admitted that if the one is false the other is true.

In all cases the contradictory of the conclusion must be assumed.

XII. Thus it is evident that in the first figure, Reduction in the

62 ¹

μὲν ἄλλα προβλήματα πάντα δείκνυται διὰ τοῦ
 ἀδυνάτου, τὸ δὲ καθόλου καταφατικὸν οὐ δείκνυται.
 ἐν δὲ τῷ μέσῳ καὶ τῷ ἐσχάτῳ καὶ τοῦτο δείκνυται
 κείσθω γὰρ τὸ Α μὴ παντὶ τῷ Β ὑπάρχειν, εἰλήφθω
 δὲ τῷ Γ παντὶ ὑπάρχειν τὸ Α. οὐκοῦν εἰ τῷ μὲν
 25 Β μὴ παντὶ τῷ δὲ Γ παντί, οὐ παντὶ τῷ Β τὸ Γ.
 τοῦτο δ' ἀδύνατον· ἔστω γὰρ φανερόν ὅτι παντὶ
 τῷ Β ὑπάρχει τὸ Γ, ὥστε ψεῦδος τὸ ὑποκείμενον.
 ἀληθὲς ἄρα τὸ παντὶ ὑπάρχειν. εἰ δὲ τὸ ἐναντίον
 ὑποτεθῇ, συλλογισμὸς μὲν ἔσται καὶ τὸ ἀδύνατον,
 30 οὐ μὴν δείκνυται τὸ προτεθέν. εἰ γὰρ τὸ Α μηδενὶ
 τῷ Β τῷ δὲ Γ παντί, οὐδενὶ τῷ Β τὸ Γ· τοῦτο δ'
 ἀδύνατον, ὥστε ψεῦδος τὸ μηδενὶ ὑπάρχειν. ἀλλ'
 οὐκ εἰ τοῦτο ψεῦδος τὸ παντὶ ἀληθές.

Ὅτε δὲ τινὶ τῷ Β ὑπάρχει τὸ Α, ὑποκείσθω τὸ Α
 μηδενὶ τῷ Β ὑπάρχειν, τῷ δὲ Γ παντὶ ὑπαρχέτω.
 35 ἀνάγκη οὖν τὸ Γ μηδενὶ τῷ Β· ὥστ' εἰ τοῦτ'
 ἀδύνατον, ἀνάγκη τὸ Α τινὶ τῷ Β ὑπάρχειν. εἰ δ'
 ὑποτεθῇ τινὶ μὴ ὑπάρχειν, ταῦτ' ἔσται ἅπερ ἐπὶ
 τοῦ πρώτου σχήματος.

Πάλιν ὑποκείσθω τὸ Α τινὶ τῷ Β ὑπάρχειν, τῷ
 δὲ Γ μηδενὶ ὑπαρχέτω. ἀνάγκη οὖν τὸ Γ τινὶ
 τῷ Β μὴ ὑπάρχειν. ἀλλὰ παντὶ ὑπήρχεν, ὥστε
 40 ψεῦδος τὸ ὑποτεθέν· οὐδενὶ ἄρα τῷ Β τὸ Α ὑπάρξει.

Ὅτε δ' οὐ παντὶ τὸ Α τῷ Β, ὑποκείσθω παντὶ
 62 ² ὑπάρχειν, τῷ δὲ Γ μηδενί. ἀνάγκη οὖν τὸ Γ
 μηδενὶ τῷ Β ὑπάρχειν. τοῦτο δ' ἀδύνατον, ὥστ'
 ἀληθὲς τὸ μὴ παντὶ ὑπάρχειν. φανερόν οὖν ὅτι

¹ ταῦτ' ἔσται Jenkinson: ταῦτ' ἔσται.

whereas all other propositions are demonstrable *per impossibile*, the universal affirmative is not so demonstrable. In the middle and last figures, however, even this is demonstrable. Let A be supposed not to apply to all B, and let it be assumed that A applies to all C. Then if it does not apply to all B, but applies to all C, C will not apply to all B. But this is impossible. For let it be evident that C applies to all B, so that the supposition is false. Then it is true that A applies to all B. But if we adopt the contrary hypothesis, although there will be a syllogism and an argument *per impossibile*, the proposition is not demonstrable. For if A applies to no B, but to all C, C will apply to no B. But this is impossible; and so it is false that A applies to no B. But it does not follow that if this is false, it is true that A applies to all B.

second figure.

Universal affirmative.

When A applies to some B, let it be supposed that A applies to no B, but let it apply to all C. Then C must apply to no B. Thus if this is impossible, A must apply to some B. If it is supposed not to apply to some, we shall have the same result as in the first figure.^a

Particular affirmative.

Again, let A be supposed to apply to some B, but let it apply to no C. Then necessarily C does not apply to some B. But originally it applied to all, and so the supposition is false. Therefore A will apply to no B.

Universal negative.

When A does not apply to all B, let it be supposed to apply to all B, but to no C. Then C must apply to no B. But this is impossible; and so it is true that A does not apply to all B. Thus it is evident

Particular negative.

^a 61 b 39 ff.

62 b

πάντες οἱ συλλογισμοὶ γίνονται διὰ τοῦ μέσου σχήματος.

- 6 XIII. Ὅμοίως δὲ καὶ διὰ τοῦ ἐσχάτου. κείσθω γὰρ τὸ Α τινὶ τῷ Β μὴ ὑπάρχειν τὸ δὲ Γ παντί· τὸ ἄρα Α τινὶ τῷ Γ οὐχ ὑπάρχει. εἰ οὖν τοῦτ' ἀδύνατον, ψεῦδος τὸ τινὶ μὴ ὑπάρχειν, ὥστ' ἀληθὲς τὸ παντί. ἐὰν δ' ὑποτεθῇ μηδενὶ ὑπάρχειν, συλλογισμὸς μὲν ἔσται καὶ τὸ ἀδύνατον, οὐ δείκνυται δὲ 10 τὸ προτεθέν· ἐὰν γὰρ τὸ ἐναντίον ὑποτεθῇ, ταῦτ' ἔσται ἄπερ ἐπὶ τῶν πρότερον. ἀλλὰ πρὸς τὸ τινὶ ὑπάρχειν αὕτη ληπτέα ἢ ὑπόθεσις. εἰ γὰρ τὸ Α μηδενὶ τῷ Β τὸ δὲ Γ τινὶ τῷ Β, τὸ Α οὐ παντὶ τῷ Γ. εἰ οὖν τοῦτο ψεῦδος, ἀληθὲς τὸ Α τινὶ τῷ Β ὑπάρχειν.
- 15 Ὅτε δ' οὐδενὶ τῷ Β ὑπάρχει τὸ Α, ὑποκείσθω τινὶ ὑπάρχειν, ἐλήφθω δὲ καὶ τὸ Γ παντὶ τῷ Β ὑπάρχον. οὐκοῦν ἀνάγκη τῷ Γ τινὶ τὸ Α ὑπάρχειν. ἀλλ' οὐδενὶ ὑπῆρχεν, ὥστε ψεῦδος τινὶ τῷ Β ὑπάρχειν τὸ Α. ἐὰν δ' ὑποτεθῇ παντὶ τῷ Β ὑπάρχειν τὸ Α, οὐ δείκνυται τὸ προτεθέν, ἀλλὰ πρὸς τὸ μὴ 20 παντὶ ὑπάρχειν αὕτη ληπτέα ἢ ὑπόθεσις. εἰ γὰρ τὸ Α παντὶ τῷ Β καὶ τὸ Γ τινὶ τῷ Β, τὸ Α ὑπάρχει τινὶ τῷ Γ· τοῦτο δὲ οὐκ ἦν, ὥστε ψεῦδος τὸ παντὶ ὑπάρχειν· εἰ δ' οὕτως, ἀληθὲς τὸ μὴ παντί. ἐὰν δ' ὑποτεθῇ τινὶ ὑπάρχειν, ταῦτ' ἔσται ἃ καὶ ἐπὶ τῶν προειρημένων.
- 25 Φανερόν οὖν ὅτι ἐν ἅπασιν τοῖς διὰ τοῦ ἀδυνάτου συλλογισμοῖς τὸ ἀντικείμενον ὑποθετέον. δηλὸν δὲ

¹ ταῦτ' ἔσται n, Jenkinson: ταῦτ' ἔσται.

* i.e. that all types of proposition can be proved *per impossibile*.

that all the syllogisms can be effected by the second figure.^a

XIII. Similarly they can all be effected by means of the last figure. Let A be supposed not to apply to some B, but to apply to all C. Then A does not apply to some C. Then if this is impossible, it is false that A does not apply to some B, and so it is true that it applies to all. But if it is supposed to apply to none, although there will be a syllogism and an argument *per impossibile*, the proposition is not demonstrable; for if the contrary hypothesis is adopted, we shall have the same result as before.^b This hypothesis must be chosen to prove that A applies to *some* B. For if A applies to no B, and C to some B, A will not apply to all C. Then if this is false, it is true that A applies to some B.

Reduction
in the third
figure.
Affirmative
proposi-
tions.

When A applies to no B, let it be supposed to apply to some; and let C also be assumed to apply to all B. Then A must apply to some C. But originally it applied to none; and so it is false that A applies to some B. If A is supposed to apply to all B, the proposition is not demonstrable; this hypothesis must be chosen to prove that A does not apply to all. For if A applies to all B, and C to some B, A applies to some C. But before this was not so; therefore it is false that A applies to all B; and if this is so, it is true that it does not apply to all. But if it is supposed to apply to some, the result will be the same as those which we have described above.^c

Negative
proposi-
tions.

Thus it is evident that in all syllogisms *per impossibile* it is the contradictory assumption that must

^b 62 a 28 ff.

^c 61 b 39. The case is not treated separately under the second figure.

62 b

καὶ ὅτι ἐν τῷ μέσῳ σχήματι δεικνυταί πως τὸ καταφατικὸν καὶ ἐν τῷ ἐσχάτῳ τὸ καθόλου.

XIV. Διαφέρει ἡ εἰς τὸ ἀδύνατον ἀπόδειξις τῆς
 20 δεικτικῆς τῷ τιθέναι ὃ βούλεται ἀναιρεῖν ἀπάγουσα
 εἰς ὁμολογούμενον ψεῦδος· ἡ δὲ δεικτικὴ ἀρχεται
 ἐξ ὁμολογούμενων θέσεων.¹ λαμβάνουσι μὲν οὖν
 ἀμφότεραι δύο προτάσεις ὁμολογούμενας· ἀλλ' ἡ
 μὲν ἐξ ὧν ὁ συλλογισμός, ἡ δὲ μίαν μὲν τούτων
 25 μίαν δὲ τὴν ἀντίφασιν τοῦ συμπεράσματος. καὶ
 εἴθα μὲν οὐκ ἀνάγκη γινώριμον εἶναι τὸ συμπέ-
 ρασμα, οὐδὲ προϋπολαμβάνειν ὡς ἔστιν ἡ οὐ· εἴθα
 δὲ ἀνάγκη ὡς οὐκ ἔστιν. διαφέρει δ' οὐδὲν φάσιν ἡ
 ἀπόφασιν εἶναι τὸ συμπέρασμα, ἀλλ' ὁμοίως ἔχει
 περὶ ἀμφοῖν.

Ἄπαν δὲ τὸ δεικτικῶς περαινόμενον καὶ διὰ τοῦ
 40 ἀδυνάτου δειχθήσεται, καὶ τὸ διὰ τοῦ ἀδυνάτου
 δεικτικῶς, διὰ τῶν αὐτῶν ὅρων.² ὅταν μὲν γὰρ ὁ
 63 α συλλογισμός ἐν τῷ πρώτῳ σχήματι γένηται, τὸ
 ἀληθὲς ἔσται ἐν τῷ μέσῳ ἢ τῷ ἐσχάτῳ, τὸ μὲν
 στερητικὸν ἐν τῷ μέσῳ τὸ δὲ κατηγορικὸν ἐν τῷ
 ἐσχάτῳ· ὅταν δ' ἐν τῷ μέσῳ ἢ ὁ συλλογισμός, τὸ
 5 ἀληθὲς ἐν τῷ πρώτῳ ἐπὶ πάντων τῶν προβλημά-
 των· ὅταν δ' ἐν τῷ ἐσχάτῳ ὁ συλλογισμός, τὸ
 ἀληθὲς ἐν τῷ πρώτῳ καὶ τῷ μέσῳ, τὰ μὲν κατα-
 φατικά ἐν τῷ πρώτῳ τὰ δὲ στερητικά ἐν τῷ μέσῳ.

Ἐστω γὰρ δεδειγμένον τὸ Α μηδενὶ ἢ μὴ παντὶ
 τῷ Β διὰ τοῦ πρώτου σχήματος. οὐκοῦν ἡ μὲν
 10 ὑπόθεσις ἦν τινὶ τῷ Β ὑπάρχειν τὸ Α, τὸ δὲ Γ

¹ θέσεων ἀληθῶν Α.

² ὅρων. ABC: ὅρων, οὐκ ἐν τοῖς αὐτοῖς δὲ σχήμασι νοίγο.

be made. It is also clear that in a sense the affirmative proposition is demonstrable in the middle figure and the universal in the last figure.^a

XIV. Proof *per impossibile* differs from ostensive proof in that the former posits that which it intends to refute by reducing it to an admitted fallacy, whereas the latter proceeds from admitted positions. Both indeed assume two admitted premisses ; but whereas the latter assumes those from which the syllogism proceeds, the former assumes one of these and one which is the contradictory of the conclusion ; and in the latter the conclusion need not be known, nor need it be presupposed to be true or not ; but in the former it must be presupposed not to be true. It makes no difference, however, whether the conclusion is affirmative or negative ; the procedure is the same in both cases.

Proof *per impossibile* compared with ostensive proof.

Every proposition which is established ostensively can also be proved *per impossibile*, and *vice versa*, by means of the same terms. For when the syllogism^b is effected in the first figure, the truth^c will appear in the middle or last figure : the negative in the middle and the affirmative in the last. When the syllogism is in the middle figure, the truth will appear in the first figure with respect to all propositions. When the syllogism is in the last figure, the truth will appear in the first or the middle : affirmative in the first, negative in the middle figure.

For example, let it be proved by the first figure that A applies to none, or does not apply to all, of B. Then the hypothesis was that A applies to some B,

Reduction by Barbara direct proof by Baroco.

^a 62 a 23-37, b 5-9, 14-18.

^b *i.e.* the reduction *ad impossibile*.

^c *i.e.* the ostensive syllogism.

63 a

ἐλαμβάνετο τῷ μὲν Α παντὶ ὑπάρχειν τῷ δὲ Β οὐδενί· οὕτω γὰρ ἐγίγνετο ὁ συλλογισμὸς καὶ τὸ ἀδύνατον. τοῦτο δὲ τὸ μέσον σχῆμα, εἰ τὸ Γ τῷ μὲν Α παντὶ τῷ δὲ Β μηδενί ὑπάρχει· καὶ φανερόν ἐκ τούτων ὅτι οὐδενί τῷ Β ὑπάρχει τὸ Α.

- 15 Ὅμοίως δὲ καὶ εἰ μὴ παντὶ δέδεικται ὑπάρχον. ἡ μὲν γὰρ ὑπόθεσις ἐστὶ παντὶ ὑπάρχειν, τὸ δὲ Γ ἐλαμβάνετο τῷ μὲν Α παντὶ τῷ δὲ Β οὐ παντί. καὶ εἰ στερητικὸν λαμβάνοιτο τὸ ΓΑ ὡσαύτως· καὶ γὰρ οὕτω γίγνεται τὸ μέσον σχῆμα.

- Πάλιν δεδείχθω τινὶ ὑπάρχον τῷ Β τὸ Α. ἡ μὲν
20 οὖν ὑπόθεσις μηδενί ὑπάρχειν, τὸ δὲ Β ἐλαμβάνετο παντὶ τῷ Γ ὑπάρχειν καὶ τὸ Α ἢ παντὶ ἢ τινὶ τῷ Γ· οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ τὸ ἔσχατον σχῆμα, εἰ τὸ Α καὶ τὸ Β παντὶ τῷ Γ· καὶ φανερόν ἐκ τούτων ὅτι ἀνάγκη τὸ Α τινὶ τῷ Β ὑπάρχειν. ὁμοίως δὲ καὶ εἰ τινὶ τῷ Γ ληφθεῖη ὑπάρχον τὸ Β ἢ τὸ Α.

- 25 Πάλιν ἐν τῷ μέσῳ σχήματι δεδείχθω τὸ Α παντὶ τῷ Β ὑπάρχον. οὐκοῦν ἡ μὲν ὑπόθεσις ἦν μὴ παντὶ τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Α παντὶ τῷ Γ καὶ τὸ Γ παντὶ τῷ Β· οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ τὸ πρῶτον σχῆμα, τὸ Α
30 παντὶ τῷ Γ καὶ τὸ Γ παντὶ τῷ Β. ὁμοίως δὲ καὶ εἰ τινὶ δέδεικται ὑπάρχον· ἡ μὲν γὰρ ὑπόθεσις ἦν μηδενί τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Α παντὶ τῷ Γ καὶ τὸ Γ τινὶ τῷ Β. εἰ δὲ στερητικὸς ὁ συλλογισμὸς, ἡ μὲν ὑπόθεσις τὸ Α τινὶ τῷ Β ὑπάρχειν, εἰληπται δὲ τὸ Α μηδενί τῷ Γ καὶ τὸ Γ
35 παντὶ τῷ Β, ὥστε γίγνεται τὸ πρῶτον σχῆμα. καὶ εἰ μὴ καθόλου ὁ συλλογισμὸς, ἀλλὰ τὸ Α τινὶ τῷ Β δέδεικται μὴ ὑπάρχειν, ὡσαύτως. ὑπόθεσις μὲν

and C was assumed to apply to all A but to no B ; this was how the syllogism and the argument *per impossibile* were effected. But this is the middle figure, if C applies to all A but to no B ; and it is evident from these premisses that A applies to no B.

Similarly too if it has been proved not to apply to all. The hypothesis is that it applies to all, and it was assumed that C applies to all A but not to all B. The same also holds supposing that CA is taken as negative ; for in this case too we get the middle figure.

Ferio-
Cesare.

Again, let it be proved that A applies to some B. Then the hypothesis is that it applies to none, and B was assumed to apply to all C and A to all or some of C ; for it is in this way that the proof *per impossibile* will result. This is the last figure, if A and B apply to all C ; and it is evident from these premisses that A must apply to some B. Similarly too supposing that B or A is taken to apply to some C.

Celarent-
Darapti
or Disamis.

Again in the second figure let it be proved that A applies to all B. Then the hypothesis was that A does not apply to all B, and the assumptions were that A applies to all C and C to all B ; for it is in this way that the proof *per impossibile* will result. This is the first figure, when A applies to all C and C to all B. Similarly too if A has been proved to apply to some B. The hypothesis was that A applies to no B, and the assumptions were that A applies to all C and C to some B. If the syllogism is negative, the hypothesis was that A applies to some B, and the assumptions were that A applies to no C and C to all B, so that we get the first figure. The same also holds if the syllogism is not universal, but it has been proved that A does not apply to some B ; for the

Baroco-
Barbara.

63 a

γὰρ παντὶ τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Α μηδενὶ τῷ Γ καὶ τὸ Γ τινὶ τῷ Β· οὕτω γὰρ τὸ πρῶτον σχῆμα.

40 Πάλιν ἐν τῷ τρίτῳ σχήματι δεδείχθω τὸ Α παντὶ τῷ Β ὑπάρχειν. οὐκοῦν ἡ μὲν ὑπόθεσις ἦν μὴ

63 b παντὶ τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Γ παντὶ τῷ Β καὶ τὸ Α παντὶ τῷ Γ· οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ τὸ πρῶτον σχῆμα. ὡσαύτως δὲ καὶ εἰ ἐπὶ τινος ἡ ἀπόδειξις· ἡ μὲν γὰρ ὑπόθεσις

μ μηδενὶ τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Γ τινὶ τῷ Β καὶ τὸ Α παντὶ τῷ Γ· εἰ δὲ στερητικὸς ὁ συλλογισμὸς, ὑπόθεσις μὲν τὸ Α τινὶ τῷ Β ὑπάρχειν, εἰληπται δὲ τὸ Γ τῷ μὲν Α μηδενὶ τῷ δὲ Β παντί· τοῦτο δὲ τὸ μέσον σχῆμα. ὁμοίως δὲ καὶ εἰ μὴ καθόλου ἡ ἀπόδειξις. ὑπόθεσις μὲν γὰρ

10 ἔσται παντὶ τῷ Β τὸ Α ὑπάρχειν, εἰληπται δὲ τὸ Γ τῷ μὲν Α μηδενὶ τῷ δὲ Β τινί· τοῦτο δὲ τὸ μέσον σχῆμα.

Φανερόν οὖν ὅτι διὰ τῶν αὐτῶν ὁρῶν καὶ δεικτικῶς ἔστι δεικνύναι τῶν προβλημάτων ἕκαστον [καὶ διὰ τοῦ ἀδυνάτου].¹ ὁμοίως δ' ἔσται καὶ

15 δεικτικῶν ὄντων τῶν συλλογισμῶν εἰς ἀδύνατον ἀπάγειν ἐν τοῖς εἰλημμένοις ὅροις, ὅταν ἡ ἀντικειμένη πρότασις τῷ συμπεράσματι ληφθῇ. γίνονται γὰρ οἱ αὐτοὶ συλλογισμοὶ τοῖς διὰ τῆς ἀτιστροφῆς, ὥστ' εὐθὺς ἔχομεν καὶ τὰ σχήματα δι' ὧν ἕκαστον ἔσται. δῆλον οὖν ὅτι πᾶν πρόβλημα
20 δέικνυται κατ' ἀμφοτέρους τοὺς τρόπους, διὰ τε τοῦ ἀδυνάτου καὶ δεικτικῶς, καὶ οὐκ ἐνδέχεται χωρίζεσθαι τὸν ἕτερον.

XV. Ἐν ποίῳ δὲ σχήματι ἔστιν ἐξ ἀντικειμένων

¹ καὶ . . . ἀδυνάτου om. AC, Waitz.

hypothesis was that A applies to all B, and the assumptions were that A applies to no C, and C to some B ; for in this way we get the first figure.

Again in the third figure let it be proved that A applies to all B. Then the hypothesis was that A does not apply to all B, and the assumptions were that C applies to all B and A to all C ; for it is in this way that the proof *per impossibile* will result ; and this is the first figure. The same also holds if the demonstration proves a particular conclusion, for then the hypothesis was that A applies to no B, and the assumptions were that C applies to some B and A to all C. If the syllogism is negative, the hypothesis was that A applies to some B, and the assumptions were that C applies to no A but to all B. This is the middle figure. Similarly too if the demonstration proves a particular negative conclusion ; the hypothesis will be that A applies to all B, and the assumptions were that C applies to no A but to some B. This is the middle figure.

Thus it is evident that each of these propositions can also be proved ostensively by means of the same terms. Similarly too if the syllogisms are ostensive it will be possible to employ reduction *ad impossibile* by using the terms already taken, if we assume the premiss which contradicts the conclusion. For we get the same syllogisms as we obtained by conversion ; and so we have at once the very figures by which each one will be effected. It is clear, then, that every proposition can be proved in both ways, both *per impossibile* and ostensively ; and that neither method can be separated from the other.

XV. In which figures we can and cannot draw a Conclusions from

63 b

προτάσεων συλλογίσασθαι καὶ ἐν ποίῳ οὐκ ἔστιν, ὥδ' ἔσται φανερόν. λέγω δ' ἀντικειμένους εἶναι
 25 προτάσεις κατὰ μὲν τὴν λέξιν τέτταρας, οἷον τὸ παντὶ τῷ οὐδενί, καὶ τὸ παντὶ τῷ οὐ παντί, καὶ τὸ τινὶ τῷ οὐδενί, καὶ τὸ τινὶ τῷ οὐ τινί, κατ' ἀλήθειαν δὲ τρεῖς· τὸ γὰρ τινὶ τῷ οὐ τινὶ κατὰ τὴν λέξιν ἀντίκειται μόνον. τούτων δ' ἐναντίας μὲν τὰς καθόλου, τὸ παντὶ τῷ μηδενὶ ὑπάρχειν (οἷον τὸ
 30 πᾶσαν ἐπιστήμην εἶναι σπουδαίαν τῷ μηδεμίαν εἶναι σπουδαίαν), τὰς δ' ἄλλας ἀντικειμένους.

Ἐν μὲν οὖν τῷ πρώτῳ σχήματι οὐκ ἔστιν ἐξ ἀντικειμένων προτάσεων συλλογισμὸς οὔτε καταφατικός οὔτε ἀποφατικός, καταφατικός μὲν ὅτι ἀμφοτέρως δεῖ καταφατικὰς εἶναι τὰς προτάσεις,
 35 αἱ δ' ἀντικείμεναι φάσις καὶ ἀπόφασις, στερητικός δὲ ὅτι αἱ μὲν ἀντικείμεναι τὸ αὐτὸ τοῦ αὐτοῦ κατηγοροῦσι καὶ ἀπαρνοῦνται, τὸ δ' ἐν τῷ πρώτῳ μέσον οὐ λέγεται κατ' ἀμφοῖν, ἀλλ' ἐκείνου μὲν ἄλλο ἀπαρνεῖται, αὐτὸ δὲ ἄλλου κατηγορεῖται· αὗται δ' οὐκ ἀντίκεινται.

Ἐν δὲ τῷ μέσῳ σχήματι καὶ ἐκ τῶν ἀντικειμένων καὶ ἐκ τῶν ἐναντίων ἐνδέχεται γίνεσθαι
 64 a συλλογισμόν. ἔστω γὰρ ἀγαθὸν μὲν ἐφ' οὗ Α, ἐπιστήμη δὲ ἐφ' οὗ Β καὶ Γ. εἰ δὴ πᾶσαν ἐπιστήμην σπουδαίαν ἔλαβε καὶ μηδεμίαν, τὸ Α τῷ Β παντὶ ὑπάρχει καὶ τῷ Γ οὐδενί, ὥστε τὸ Β τῷ Γ οὐδενί· οὐδεμία ἄρα ἐπιστήμη ἐπιστήμη ἐστίν.
 5 ὁμοίως δὲ καὶ εἰ πᾶσαν λαβὼν σπουδαίαν τὴν ἰατρικὴν μὴ σπουδαίαν ἔλαβε· τῷ μὲν γὰρ Β παντὶ τὸ Α τῷ δὲ Γ οὐδενί, ὥστε ἢ τίς ἐπιστήμη οὐκ

conclusion from opposite premisses will be evident from the following analysis.—I hold that there are four pairs of premisses which exhibit a verbal opposition, viz., ‘applies to all’ and ‘applies to none’; ‘applies to all’ and ‘does not apply to all’; ‘applies to some’ and ‘applies to none’; and ‘applies to some’ and ‘does not apply to some’; but only three of these are really opposed, because the opposition of ‘applies to some’ and ‘does not apply to some’ is only verbal. Of these the universal premisses ‘applies to all’ and ‘applies to none’ (e.g., ‘all knowledge is good’ and ‘no knowledge is good’) are contrary; the other two pairs are contradictory.

In the first figure, then, a syllogism from opposite premisses is impossible, whether it be affirmative or negative. An affirmative syllogism is impossible because to produce it both the premisses must be affirmative, and a pair of opposite premisses is composed of an affirmation and its negation. A negative syllogism is impossible because opposite premisses affirm and deny the same predicate of the same subject, and in the first figure the middle term is not predicated of both the others, but something else is denied of it while it is itself predicated of something else; and the premisses thus formed are not opposed.

In the middle figure a syllogism may be obtained both from contradictory and from contrary premisses. For let A be ‘good,’ and let B and C be ‘science.’ Then if we assume that all science is good, and then that no science is good, A applies to all B and to no C, so that B applies to no C. Therefore no science is science. Similarly too if after assuming that all science is good we then assume that medicine is not good; for A applies to all B but to no C, so that the

64 a

- ἔσται ἐπιστήμη. καὶ εἰ τῷ μὲν Γ παντὶ τὸ Α τῷ δὲ Β μηδενί, ἔστι δὲ τὸ μὲν Β ἐπιστήμη τὸ δὲ Γ ἰατρικὴ τὸ δὲ Α ὑπόληψις· οὐδεμίαν γὰρ ἐπιστήμην
 10 ὑπόληψιν λαβὼν εἵληφε τινὰ ἐπιστήμην εἶναι ὑπόληψιν. διαφέρει δὲ τοῦ πάλαι τῷ ἐπὶ τῶν ὄρων ἀντιστρέφεισθαι· πρότερον μὲν γὰρ πρὸς τῷ Β, νῦν δὲ πρὸς τῷ Γ τὸ καταφατικόν. καὶ ἂν ἦ δὲ μὴ καθόλου ἢ ἑτέρα πρότασις ὡσαύτως· αἰεὶ γὰρ τὸ μέσον ἐστὶν ὃ ἀπὸ θατέρου μὲν ἀποφατικῶς λέγεται
 15 κατὰ θατέρου δὲ καταφατικῶς.

- Ὡστ' ἐνδέχεται ἀντικείμενα περαίνεισθαι, πλὴν οὐκ αἰεὶ οὐδὲ πάντως, ἀλλ' ἐὰν οὕτως ἔχη τὰ ὑπὸ τὸ μέσον ὥστ' ἦ ταῦτα εἶναι ἢ ὅλον πρὸς μέρος. ἄλλως δ' ἀδύνατον· οὐ γὰρ ἔσσονται οὐδαμῶς αἱ προτάσεις οὔτ' ἐναντίαι οὔτ' ἀντικείμεναι.
 20 Ἐν δὲ τῷ τρίτῳ σχήματι καταφατικὸς μὲν συλλογισμὸς οὐδέ ποτ' ἔσται ἐξ ἀντικειμένων προτάσεων διὰ τὴν εἰρημένην αἰτίαν καὶ ἐπὶ τοῦ πρώτου σχήματος, ἀποφατικὸς δ' ἔσται, καὶ καθόλου καὶ μὴ καθόλου τῶν ὄρων ὄντων. ἔστω γὰρ ἐπιστήμη ἐφ' οὗ τὸ Β καὶ Γ, ἰατρικὴ δ' ἐφ' οὗ
 25 Α. εἰ οὖν λάβοι πᾶσαν ἰατρικὴν ἐπιστήμην καὶ μηδεμίαν ἰατρικὴν ἐπιστήμην, τὸ Β παντὶ τῷ Α εἵληφε καὶ τὸ Γ οὐδενί, ὥστ' ἔσται τις ἐπιστήμη οὐκ ἐπιστήμη. ὁμοίως δὲ καὶ ἂν μὴ καθόλου ληφθῇ ἢ ΒΑ' πρότασις· εἰ γὰρ ἐστὶ τις ἰατρικὴ ἐπιστήμη καὶ πάλιν μηδεμία ἰατρικὴ ἐπιστήμη,
 30 συμβαίνει ἐπιστήμην τινὰ μὴ εἶναι ἐπιστήμην. εἰσὶ δὲ καθόλου μὲν τῶν ὄρων λαμβανομένων ἐναντίαι αἱ προτάσεις, ἐὰν δ' ἐν μέρει ἄτερος ἀντικείμεναι.

¹ BA ABC, Waitz: AB uolgo.

particular science of medicine will not be science. Also if A applies to all C but to no B, and B is science, C medicine and A belief ; for after assuming that no science is belief, we have now assumed that a particular science is belief. This differs from the former example in being converted in respect of its terms ; for in the former example the affirmative proposition was attached to B, but now it is attached to C. The same will still be true if the other premiss is not universal ; for the middle is always that which is stated negatively of one term and affirmatively of the other.

Thus it is possible to draw an inference from opposite premisses ; not always, however, nor under all conditions, but only if the relation of the terms included under the middle is that of identity or of whole to part. No other relation is possible ; otherwise the premisses will be in no sense either contrary or contradictory.

In the third figure there can never be an affirmative syllogism from opposite premisses, for the reason stated in the case of the first figure ^{Third figure.} ^a ; but there can be a negative syllogism, whether the terms are universal or not. Let B and C stand for science, and A for medicine. Supposing then that we assume that all medicine is science, and that no medicine is science ; then we have assumed that B applies to all A, and C to no A, and therefore some science will not be science. Similarly too if the premiss BA which we assume is not universal ; for if some medicine is science, and again no medicine is science, it follows that some science is not science. The premisses are contrary if the terms assumed are universal, but contradictory if one term is particular.

^a 63 b 33.

64 a

Δεῖ δὲ κατανοεῖν ὅτι ἐνδέχεται μὲν οὕτω τὰ ἀντικείμενα λαμβάνειν, ὥσπερ εἶπομεν πᾶσαν
 25 ἐπιστήμην σπουδαίαν εἶναι καὶ πάλιν μηδεμίαν
 ἢ τινὰ μὴ σπουδαίαν (ὅπερ οὐκ εἴωθε λανθάνειν),
 ἔστι δὲ δι' ἄλλων ἐρωτημάτων συλλογίσασθαι θά-
 τερον, ἢ ὡς ἐν Τοπικοῖς ἐλέχθη λαβεῖν.

Ἐπεὶ δὲ τῶν καταφάσεων αἱ ἀντιθέσεις τρεῖς,
 ἑξαχῶς συμβαίνει ταῖς ἀντικείμενα λαμβάνειν, ἢ παντὶ
 40 καὶ μηδενί, ἢ παιτὶ καὶ μὴ παιτί, ἢ τινὶ καὶ μηδενί,
 64 b καὶ τοῦτο ἀντιστρέφει ἐπὶ τῶν ὅρων, ὡς τὸ Α
 παντὶ τῷ Β τῷ δὲ Γ μηδενί, ἢ τῷ Γ παντὶ τῷ δὲ
 Β μηδενί, ἢ τῷ μὲν παιτὶ τῷ δὲ μὴ παντί, καὶ
 πάλιν τοῦτο ἀντιστρέφει κατὰ τοὺς ὅρους. ὁμοίως
 δὲ καὶ ἐπὶ τοῦ τρίτου σχήματος· ὥστε φανερόν
 5 ὅσαχῶς τε καὶ ἐν ποίοις σχήμασιν ἐνδέχεται διὰ
 τῶν ἀντικειμένων προτάσεων γενέσθαι συλλο-
 γισμόν.

Φανερόν δὲ καὶ ὅτι ἐκ ψευδῶν μὲν ἔστιν ἀληθὲς
 συλλογίσασθαι, καθάπερ εἴρηται πρότερον, ἐκ δὲ
 τῶν ἀντικειμένων οὐκ ἔστιν· αἰεὶ γὰρ ἐναντίος ὁ
 10 συλλογισμὸς γίγνεται τῷ πράγματι· ὡς εἰ ἔστιν
 ἀγαθόν, μὴ εἶναι ἀγαθόν, ἢ εἰ ζῶον, μὴ ζῶον, διὰ
 τὸ ἐξ ἀντιφάσεως εἶναι τὸν συλλογισμόν καὶ τοὺς
 ὑποκειμένους ὅρους ἢ τοὺς αὐτοὺς εἶναι ἢ τὸν μὲν
 ὅλον τὸν δὲ μέρος. δῆλον δὲ καὶ ὅτι ἐν τοῖς παρα-
 λογισμοῖς οὐδὲν κωλύει γίνεσθαι τῆς ὑποθέσεως
 15 ἀντίφασιν, ὡς εἰ ἔστι περιττόν, μὴ εἶναι περιττόν·
 ἐκ γὰρ τῶν ἀντικειμένων προτάσεων ἐναντίος ἦν ὁ

• *Topics*, VIII. i.• Chs. ii.-iv. *supra*.

PRIOR ANALYTICS, II. xv

It should be observed that while we may assume the opposite propositions in the way described above, as we said that all science is good, and again that no science is good, or that some science is not good (in this case the contradiction is not usually overlooked), it is also possible to establish one of the propositions by means of further questions, or to assume it as we have described in the *Topics*.^a

Since there are three forms of opposition to an affirmative statement, it follows that there are six ways of assuming opposite propositions. The predicate can be said to apply to all and to none, or to all and not to all, or to some and to none ; and each of these pairs can be converted in respect of its terms : *e.g.*, it can be said that A applies to all B but to no C, or to all C but to no B, or to all of the former but not to all of the latter ; and this again can be converted in respect of its terms. Similarly too in the third figure. Thus it is evident in how many ways and in which figures a syllogism can be effected by means of opposite premisses.

It is evident also that whereas we can draw a true inference from false premisses, as we have explained above,^b we cannot do so from opposite premisses ; for the resulting conclusion is always contrary to the fact : *e.g.*, if a thing is good, the inference is that it is not good, or if it is an animal, that it is not an animal. This is because the syllogism proceeds from contradictory premisses, and the terms laid down are either the same or related as whole and part. It is clear also that in fallacious reasoning there is no reason why the result should not be the contradiction of the original hypothesis ; *e.g.*, if the subject is odd, that it is not odd. For we have seen that the conclusion

Possible combinations of opposite premisses.

Opposite premisses cannot yield a true conclusion.

64 b

συλλογισμός· ἐὰν οὖν λάβῃ τοιαύτας, ἔσται τῆς ὑποθέσεως ἀντίφασις.

Δεῖ δὲ κατανοεῖν ὅτι οὕτω μὲν οὐκ ἔστιν ἐναντία συμπεράνασθαι ἐξ ἐνὸς συλλογισμοῦ, ὥστ' εἶναι τὸ συμπέρασμα τὸ μὴ ὄν ἀγαθὸν ἀγαθὸν ἢ ἄλλο τι
 20 τοιοῦτον, ἐὰν μὴ εὐθύς ἢ πρότασις τοιαύτη ληφθῇ, οἷον πᾶν ζῶον λευκὸν εἶναι καὶ μὴ λευκόν, τὸν δ' ἀνθρώπον ζῶον· ἀλλ' ἢ προσλαβεῖν δεῖ τὴν ἀντίφασιν (οἷον ὅτι πᾶσα ἐπιστήμη ὑπόληψις,¹ εἴτα λαβεῖν ὅτι ἡ ἰατρικὴ ἐπιστήμη μὲν ἔστιν οὐδεμία δ' ὑπόληψις,
 25 ὥσπερ οἱ ἔλεγχοι γίνονται), ἢ ἐκ δύο συλλογισμῶν ὥστε δ' εἶναι ἐναντία κατ' ἀλήθειαν τὰ εἰλημμένα οὐκ ἔστιν ἄλλον τρόπον ἢ τοῦτον, καθάπερ εἴρηται πρότερον.

XVI. Τὸ δ' ἐν ἀρχῇ αἰτεῖσθαι καὶ λαμβάνειν ἔστι μὲν, ὡς ἐν γένει λαβεῖν, ἐν τῷ μὴ ἀποδεικνύναι
 30 τὸ προκείμενον, τοῦτο δὲ ἐπισυμβαίνει πολλαχῶς· καὶ γὰρ εἰ ὅλως μὴ συλλογίζεται, καὶ εἰ δι' ἀγνωστοτέρων ἢ ὁμοίως ἀγνώστων, καὶ εἰ διὰ τῶν ὑστέρων τὸ πρότερον· ἢ γὰρ ἀπόδειξις ἐκ πιστοτέρων τε καὶ προτέρων ἔστιν. τούτων μὲν οὖν οὐδέν ἔστι τὸ αἰτεῖσθαι τὸ ἐξ ἀρχῆς· ἀλλ' ἐπεὶ τὰ
 35 μὲν δι' αὐτῶν πέφυκε γνωρίζεσθαι τὰ δὲ δι' ἄλλων (αἱ μὲν γὰρ ἀρχαὶ δι' αὐτῶν, τὰ δ' ὑπὸ τὰς ἀρχὰς δι' ἄλλων), ὅταν μὴ τὸ δι' αὐτοῦ γνωστὸν δι' αὐτοῦ

¹ ὑπόληψις B¹n¹, Waitz: ὑπόληψις καὶ οὐχ ὑπόληψις uolgo.

² μὴ τὸ] τὸ μὴ nf, corr. cu.

* i.e. can produce an (affirmative) self-contradictory conclusion. This has been shown to be impossible in the first figure (63 b 33) and in the third (64 a 20), while the second figure cannot give an affirmative conclusion.

PRIOR ANALYTICS, II. xv-xvi

resulting from opposite premisses is contrary to fact ; therefore if we assume premisses of this kind, we shall obtain a contradiction of the original hypothesis.

It should be observed that it is not possible to infer contrary conclusions from a single syllogism so that the conclusion states that that which is not good is good, or any other similar contradiction (unless the contradictory form goes back to the original premisses, *e.g.*, ' every animal is white and not white ' and then ' man is an animal ') ; we must either assume the contradictory statement as well, *e.g.*, assume that all science is belief, and then that medicine is a science, but that no medicine is belief (as in the process of refutation) ; or we must draw our conclusions from two syllogisms. There is no other way, as we have said above, in which the assumptions can be truly contrary.^a

A contradiction cannot be inferred from two premisses unless it is inherent in one of them.

XVI. Begging or assuming the point at issue consists (to take the expression in its widest sense) in failing to demonstrate the required proposition. But there are several other ways in which this may happen : for example, if the argument has not taken syllogistic form at all, or if the premisses are less well known or no better known than the point to be proved, or if the prior is proved by the posterior ; for demonstration proceeds from premisses which are surer and prior. None of these procedures is begging the point at issue.

Petitio principii

Now some things are naturally knowable through themselves, and others through something else (for principles are knowable through themselves, while the examples which fall under the principles are knowable through something else) ; and when any one tries to prove by means of itself that which is not

64 b

- τις ἐπιχειρῇ δεικνύναι, τότε αἰτεῖται τὸ ἐξ ἀρχῆς. τοῦτο δ' ἔστι μὲν οὕτω ποιεῖν ὥστ' εὐθὺς ἀξιῶσαι τὸ προκείμενον, ἐνδέχεται δὲ καὶ μεταβάνας ἐπ' ἄλλα ἅττα τῶν πεφυκότων δι' ἐκείνου δεικνυσθαι
- 85 α διὰ τούτων ἀποδεικνύναι τὸ ἐξ ἀρχῆς, ὅλον εἰ τὸ Α δεικνύοιτο διὰ τοῦ Β τὸ δὲ Β διὰ τοῦ Γ, τὸ δὲ Γ πεφυκὸς εἴη δεικνυσθαι διὰ τοῦ Α· συμβαίνει γὰρ αὐτὸ δι' αὐτοῦ τὸ Α δεικνύναι τοὺς οὕτω συλλογιζομένους. ὅπερ ποιοῦσιν οἱ τὰς παραλλήλους οἰόμενοι γράφειν· λαιθάνουσι γὰρ αὐτοὶ ἑαυτοὺς τοιαῦτα λαμβάνοντες ἃ οὐχ ὅλον τε ἀποδείξαι μὴ οὐσῶν τῶν παραλλήλων· ὥστε συμβαίνει τοῖς οὕτω συλλογιζομένοις ἕκαστον εἶναι λέγειν, εἰ ἔστιν ἕκαστον· οὕτω δὲ ἅπαν ἔσται δι' αὐτοῦ γνωστόν· ὅπερ ἀδύνατον.
- 10 Εἰ οὖν τις ἀδήλου ὄντος ὅτι τὸ Α ὑπάρχει τῷ Γ, ὁμοίως δὲ καὶ ὅτι τῷ Β, αἰτοῖτο τῷ Β ὑπάρχειν τὸ Α, οὕτω δῆλον εἰ τὸ ἐν ἀρχῇ αἰτεῖται, ἀλλ' ὅτι οὐκ ἀποδείκνυσι δῆλον· οὐ γὰρ ἀρχὴ ἀποδείξεως τὸ ὁμοίως ἀδήλον. εἰ μέντοι τὸ Β πρὸς τὸ Γ οὕτως
- 15 ἔχει ὥστε ταῦτόν εἶναι, ἢ δῆλον ὅτι ἀντιστρέφουσιν, ἢ ὑπάρχει θάτερον θατέρῳ, τὸ ἐν ἀρχῇ αἰτεῖται. καὶ γὰρ ἂν ὅτι τῷ Β τὸ Α ὑπάρχει δι' ἐκείνων δεικνύοι, εἰ ἀντιστρέφοι· νῦν δὲ τοῦτο κωλύει, ἀλλ' οὐχ ὁ τρόπος· εἰ δὲ τοῦτο ποιοῖ, τὸ εἰρημένον ἂν ποιοῖ καὶ ἀντιστρέφοι διὰ τριῶν. ὡσαύτως δὲ κἂν

¹ διὰ] ὡς διὰ C¹.

* e.g., that the interior opposite angles are equal, which depends upon the parallelism of the lines.

² Sc. than the point to be proved.

³ i.e. a premiss; cf. 53 a 3.

⁴ Sc. as genus to species.

* Assuming that B and C are not convertible.

knowable by means of itself, then he is begging the point at issue. This may be done by directly postulating the proposition which is to be proved ; but we may also have recourse to some other propositions of a sort which are of their very nature proved by means of our proposition, and prove the point at issue by means of them : *e.g.*, supposing that A is proved by B and B by C, and it is the nature of C to be proved by A ; for if anyone argues in this way it follows that he is proving A by means of itself. This is exactly what those persons do who think that they are drawing parallel lines ; for they do not realize that they are making assumptions ^a which cannot be proved unless the parallel lines exist. Thus it follows that those who argue in this way are saying that any given thing is so, if it is so. But on this principle everything will be self-evident ; which is impossible.

Thus if it is uncertain whether A applies to C, and equally uncertain whether it applies to B, supposing that anyone claims that A applies to B, it is not yet clear whether he is begging the point at issue, but it is clear that he is not demonstrating it ; for that which is no less uncertain ^b is not the starting-point of demonstration.^c If, however, the relation of B to C is such that they are identical, or that they are clearly convertible, or that one applies to the other,^d then he is begging the point at issue ; for he could also prove by these premisses, if he were to convert them, that A applies to B. As it is, the conditions ^e prevent this, although the method of argument does not. But if he were to do this, he would be doing what we have described,^f and proving reciprocally by three propositions. So too supposing that he

*Petitio
principii
when (1)
the major
premiss,*

^f 65 a 1-4.

65 a

- 20 εἰ τὸ Β τῷ Γ λαμβάνοι ὑπάρχειν, ὁμοίως ἀδῆλον ὄν καὶ εἰ τὸ Α, οὐπω τὸ ἐξ ἀρχῆς αἰτεῖται, ἀλλ' οὐκ ἀποδείκνυσιν. ἐὰν δὲ ταυτόν ᾗ τὸ Α καὶ Β ἢ τῷ ἀντιστρέφειν ἢ τῷ ἐπισθαί τῷ Β τὸ Α, τὸ ἐξ ἀρχῆς αἰτεῖται διὰ τὴν αὐτὴν αἰτίαν· τὸ γὰρ ἐξ ἀρχῆς τί δύναται εἶρηται ἡμῖν, ὅτι τὸ δι' αὐτοῦ
- 25 δεικνύναι τὸ μὴ δι' αὐτοῦ δῆλον.

Εἰ οὖν ἐστὶ τὸ ἐν ἀρχῇ αἰτεῖσθαι τὸ δι' αὐτοῦ δεικνύναι τὸ μὴ δι' αὐτοῦ δῆλον, τοῦτο δ' ἐστὶ τὸ μὴ δεικνύναι ὅταν ὁμοίως ἀδήλων ὄντων τοῦ δεικνυμένου καὶ δι' οὗ δεικνύται ἢ τῷ ταῦτά τῷ αὐτῷ

30 ἢ τῷ ταυτόν τοῖς αὐτοῖς ὑπάρχειν, ἐν μὲν τῷ μέσῳ σχήματι καὶ τρίτῳ ἀμφοτέρως ἂν ἐνδέχοιτο τὸ ἐν ἀρχῇ αἰτεῖσθαι, ἐν δὲ κατηγορικῷ συλλογισμῷ ἔν τε τῷ τρίτῳ καὶ τῷ πρώτῳ· ὅταν δ' ἀποφατικῶς, ὅταν τὰ αὐτὰ ἀπὸ τοῦ αὐτοῦ, καὶ οὐχ ὁμοίως ἀμφοτέραι αἱ προτάσεις (ὡσαύτως δὲ καὶ ἐν τῷ

35 μέσῳ), διὰ τὸ μὴ ἀντιστρέφειν τοὺς ὅρους κατὰ τοὺς ἀποφατικούς συλλογισμούς.

Ἔστι δὲ τὸ ἐν ἀρχῇ αἰτεῖσθαι ἐν μὲν ταῖς ἀποδείξεσι τὰ κατ' ἀλήθειαν οὕτως ἔχοντα, ἐν δὲ τοῖς διαλεκτικοῖς τὰ κατὰ δόξαν.

XVII. Τὸ δὲ μὴ παρὰ τοῦτο συμβαίνειν τὸ ψεῦδος, ὃ πολλάκις ἐν τοῖς λόγοις εἰώθαμεν λέγειν,

* 64 b 31-34.

† i.e. either in the minor or in the major premiss.

‡ Because the second figure does not permit affirmative syllogisms.

§ Sc. 'or the same predicate is denied of identical subjects.'

• The terms of a negative premiss are not convertible, and so the convertible terms must be those of the affirmative

PRIOR ANALYTICS, II. xvi-xvii

should assume that B applies to C, although this is no less uncertain than whether A does ; he is not yet begging the point at issue, but he is not demonstrating it. If, however, A and B are identical, either because they are convertible or because A is a consequent of B, he is begging the point at issue, for the same reason as before ; for we have explained above ^a that to beg the point at issue consists in proving by means of itself that which is not self-evident.

(2) the minor premiss is no better known than the conclusion.

If, then, to beg the point at issue is to prove by means of itself that which is not self-evident ; *i.e.*, failure to prove, when the proposition to be proved and that by which it is proved are equally uncertain, either because identical predicates apply to the same subject or because the same predicate applies to identical subjects : then in the middle and third figures the point at issue can be begged in either way ^b ; in affirmative syllogisms, however, it occurs only in the third and first figures.^c But when the syllogism is negative we have *petitio principii* when identical predicates are denied of the same subject,^d and it does not occur in both premisses indifferently (and the same holds good of the middle figure), since the terms are not convertible in negative syllogisms.^e

How *petitio principii* occurs in the several figures.

In demonstrations the point which is begged represents the true relation of the terms ; in dialectical arguments it represents the relation which is commonly accepted.

XVII. The objection ' this is not the cause of the fallacy,' which we are accustomed to use frequently premiss ; therefore the *petitio principii* must be in the negative premiss. This whole section is involved and inaccurate. In point of fact *petitio principii* can occur (1) in Barbara (major and minor) and Celarent (major) ; (2) in Camestres (minor) ; (3) in Darapti and Felapton (major).

'False Cause': an objection

65 a

40 πρῶτον μὲν ἐστὶν ἐν τοῖς εἰς τὸ ἀδύνατον συλ-
 65 b λογισμοῖς, ὅταν πρὸς ἀντίφασιν ἢ τούτου ὁ ἐδεί-
 κνυτο τῇ εἰς τὸ ἀδύνατον. οὔτε γὰρ μὴ ἀντιφάσας
 ἐρεῖ τὸ οὐ παρὰ τοῦτο, ἀλλ' ὅτι ψεῦδός τι ἐτέθη
 τῶν πρότερον, οὔτ' ἐν τῇ δεικνύουσῃ· οὐ γὰρ
 τίθησιν ὁ ἀντίφασιν.¹

Ἔτι δ' ὅταν ἀναιρεθῇ τι δεικτικῶς διὰ τῶν ΑΒΓ,
 οὐκ ἔστιν εἰπεῖν ὡς οὐ παρὰ τὸ κείμενον γεγένηται
 ὁ συλλογισμός. τὸ γὰρ μὴ παρὰ τοῦτο γίνεσθαι
 τότε λέγομεν ὅταν ἀναιρεθέντος τούτου μηδὲν ἦττον
 περαίνεται ὁ συλλογισμός, ὅπερ οὐκ ἔστιν ἐν τοῖς
 δεικτικοῖς· ἀναιρεθείσης γὰρ τῆς θέσεως οὐδ' ὁ
 πρὸς ταύτην ἔσται συλλογισμός. φανερόν οὖν ὅτι
 10 ἐν τοῖς εἰς τὸ ἀδύνατον λέγεται τὸ μὴ παρὰ τοῦτο,
 καὶ ὅταν οὕτως ἔχη πρὸς τὸ ἀδύνατον ἢ ἐξ ἀρχῆς
 ὑπόθεσις ὥστε καὶ οὔσης καὶ μὴ οὔσης ταύτης
 οὐδὲν ἦττον συμβαίνει τὸ ἀδύνατον.

Ὁ μὲν οὖν φανερώτατος τρόπος ἐστὶ τοῦ μὴ παρὰ
 τὴν θέσιν εἶναι τὸ ψεῦδος ὅταν ἀπὸ τῆς ὑποθέσεως
 1 ἀσύναπτος ἢ ἀπὸ τῶν μέσων πρὸς τὸ ἀδύνατον ὁ
 συλλογισμός, ὅπερ εἴρηται καὶ ἐν Τοπικοῖς. τὸ γὰρ
 τὸ ἀναίτιον ὡς αἷτιον τιθέναι τοῦτό ἐστιν, ὅλον εἰ
 βουλόμενος δεῖξαι ὅτι ἀσύμμετρος ἢ διάμετρος ἐπι-
 χειροῖ τὸν Ζήνωνος λόγον δεικνύναι, ὡς οὐκ ἔστι
 κινεῖσθαι, καὶ εἰς τοῦτο ἀπάγοι τὸ ἀδύνατον· οὐδα-
 20 μῶς γὰρ οὐδαμῇ συνεχές ἐστι τὸ ψεῦδος τῇ φάσει

¹ ὁ ἀντίφασιν Α' Β' Γ': ὁ ἀντίφασιν Β': ὁ ἀντίφασιν υ': ὁ
 ἀντιφάσων Α': ἀντιφάσων η': τὴν ἀντιφάσιν inf.

^a *Soph. El.* 167 b 21 ff.

^b i.e. it is illegitimate to try to refute a hypothesis by reduction when the impossible conclusion does not depend upon that hypothesis.

^c Cf. *Physics*, VI. ix. 239 b 10 ff.

PRIOR ANALYTICS, II. xvii

in our arguments, is met with primarily in syllogisms involving reduction *ad impossibile* ; it is there used to contradict the proposition which was being proved by reduction *ad impossibile*. For unless our opponent contradicts this he will not say ' this is not the cause of the fallacy ' ; he will protest that there was a false assumption in the earlier stages of the argument. Nor will he use the objection in an ostensive proof, since in this one does not posit something which contradicts the conclusion.

raised
against
proofs *per
impossible*.

It is not
used against
ostensive
proofs.

Further, when something is refuted ostensively by means of the terms A, B and C, it cannot be maintained that the syllogism does not depend upon the assumption ; because we only say that something is not the cause when even if it is refuted the syllogism is concluded none the less. This is not possible in ostensive syllogisms ; for when the hypothesis is refuted the syllogism which is related to it will no longer hold good. Thus it is evident that the objection ' this is not the cause ' is used in reduction *ad impossibile* when the original hypothesis is so related to the impossible conclusion that the latter results whether the hypothesis is valid or not.

The most obvious form in which the hypothesis is not the cause of the fallacy is when the syllogism proceeds from the middle terms to the impossible conclusion independently of the hypothesis, as we have described in the *Topics*.^a This is to posit as a cause that which is no cause ^b ; as if someone wishing to prove that the diagonal of a square is incommensurable were to try to prove Zeno's argument that motion is impossible,^c and were to use reduction *ad impossibile* to this end ; for there is no connexion in any way at all between the fallacy and the original

The
impossible
conclusion
may be
(1) quite un-
connected
with the
hypothesis,

65 b

τῇ ἐξ ἀρχῆς. ἄλλος δὲ τρόπος εἰ συνεχές μὲν εἴη
 τὸ ἀδύνατον τῇ ὑποθέσει, μὴ μέντοι δι' ἐκείνην
 συμβαίνει. τοῦτο γὰρ ἐγχωρεῖ γενέσθαι καὶ ἐπὶ τὸ
 αἶνω καὶ ἐπὶ τὸ κάτω λαμβάνοντι τὸ συνεχές, οἷον
 25 εἰ τὸ Α τῷ Β κεῖται ὑπάρχον τὸ δὲ Β τῷ Γ τὸ
 δὲ Γ τῷ Δ, τοῦτο δὲ εἴη ψεῦδος, τὸ Β τῷ Δ ὑπάρ-
 χειν· εἰ γὰρ ἀφαιρεθέντος τοῦ Α μηδὲν ἦττον ὑπάρ-
 χοι τὸ Β τῷ Γ καὶ τὸ Γ τῷ Δ, οὐκ ἂν εἴη τὸ ψεῦδος
 διὰ τὴν ἐξ ἀρχῆς ὑπόθεσιν. ἢ πάλιν εἰ τις ἐπὶ τὸ
 αἶνω λαμβάνοι τὸ συνεχές, οἷον εἰ τὸ μὲν Α τῷ Β
 30 τῷ δὲ Α τὸ Ε καὶ τῷ Ε τὸ Ζ, ψεῦδος δ' εἴη τὸ
 ὑπάρχειν τῷ Α τὸ Ζ· καὶ γὰρ οὕτως οὐδὲν ἂν ἦττον
 εἴη τὸ ἀδύνατον ἀναιρεθείσης τῆς ἐξ ἀρχῆς ὑπο-
 θέσεως.

Ἄλλα δεῖ πρὸς τοὺς ἐξ ἀρχῆς ὅρους συνάπτειν τὸ
 ἀδύνατον· οὕτω γὰρ ἔσται διὰ τὴν ὑπόθεσιν, οἷον
 35 ἐπὶ μὲν τὸ κάτω λαμβάνοντι τὸ συνεχές πρὸς τὸν
 κατηγορούμενον τῶν ὅρων· εἰ γὰρ ἀδύνατον τὸ Α
 τῷ Δ ὑπάρχειν, ἀφαιρεθέντος τοῦ Α οὐκέτι ἔσται τὸ
 ψεῦδος. ἐπὶ δὲ τὸ αἶνω, καθ' οὗ κατηγορεῖται· εἰ
 γὰρ τῷ Β μὴ ἐγχωρεῖ τὸ Ζ ὑπάρχειν, ἀφαιρεθέντος
 τοῦ Β οὐκέτι ἔσται τὸ ἀδύνατον. ὁμοίως δὲ καὶ
 40 στερητικῶν τῶν συλλογισμῶν ὄντων.

66 a Φανερόν οὖν ὅτι τοῦ ἀδυνάτου μὴ πρὸς τοὺς ἐξ
 ἀρχῆς ὅρους ὄντος οὐ παρὰ τὴν θέσιν συμβαίνει τὸ
 ψεῦδος. ἢ οὐδ' οὕτως αἰεὶ διὰ τὴν ὑπόθεσιν ἔσται
 τὸ ψεῦδος· καὶ γὰρ εἰ μὴ τῷ Β ἀλλὰ τῷ Κ ἐτέθη τὸ
 5 Α ὑπάρχειν, τὸ δὲ Κ τῷ Γ καὶ τοῦτο τῷ Δ, καὶ
 οὕτω μένει τὸ ἀδύνατον· ὁμοίως δὲ καὶ ἐπὶ τὸ αἶνω

* i.e. working towards or away from the most universal term.

* Sc. in the hypothesis.

* i.e. that A applies to D.

assertion. We have another form when the impossible conclusion is connected with the hypothesis, but does not follow because of it. This may occur whether one regards the connexion in the upward or in the downward direction,^a *e.g.*, if A is assumed to apply to B and B to C and C to D, and it is false that B applies to D ; for if when A is eliminated B none the less applies to C and C to D, then the fallacy cannot be due to the original hypothesis. Or again, if one regards the connexion in the upward direction, *e.g.*, if A applies to B and E to A and F to E, and it is false that F applies to A ; for in this case too the impossible conclusion will follow none the less if the original hypothesis is eliminated.

or (2)
connected
with it,
but not
dependent
upon it.

The impossible conclusion must be connected with the original terms, for then it will be due to the hypothesis. *E.g.*, if we are regarding the connexion in the downward direction, the impossible conclusion must be connected to the term which is the predicate.^b For if it is impossible that A should apply to D, when A is eliminated the fallacy will no longer exist. In the upward direction the connexion should be to the term of which the other is predicated.^b For if F cannot apply to B, when B is eliminated the fallacy will no longer exist. Similarly too if the syllogisms are negative.

To avoid
the objec-
tion of Fals-
Cause the
conclusion
must
proceed
from the
original
premisses.

Thus it is evident that if the impossible conclusion is not related to the original terms, the fallacy is not due to the hypothesis. Indeed even when the conclusion is so related, the fallacy will not always be due to the hypothesis ; for supposing that A had been assumed to apply not to B but to K, and K to C and C to D ; even so the impossible conclusion^c remains. Similarly too if one takes the terms in the

Even so the
objection
may some-
times be
made,

66 a

λαμβάνοντι τοὺς ὄρους, ὥστ' ἐπεὶ καὶ ὄντος καὶ μὴ
 10 ὄντος τούτου συμβαίνει τὸ ἀδύνατον, οὐκ ἂν εἴη
 παρὰ τὴν θέσιν. ἢ τὸ μὴ ὄντος τούτου μηδὲν
 ἦττον γίνεσθαι τὸ ψεῦδος οὐχ οὕτω ληπτέον ὥστ'
 ἄλλου τιθεμένου συμβαίνειν τὸ ἀδύνατον, ἀλλ' ὅταν
 ἀφαιρεθέντος τούτου διὰ τῶν λοιπῶν προτάσεων
 ταὐτὸ περαίνεται ἀδύνατον, ἐπεὶ ταὐτό γε ψεῦδος
 συμβαίνειν διὰ πλειόνων ὑποθέσεων οὐδὲν ἴσως
 ἄτοπον, οἷον τὰς παραλλήλους συμπίπτειν καὶ εἰ
 μείζων ἐστὶν ἢ ἐντὸς τῆς ἐκτὸς καὶ εἰ τὸ τρίγωνον
 15 ἔχει πλείους ὀρθὰς δικεῖν.

XVIII. Ὁ δὲ ψευδὴς λόγος γίγνεται παρὰ τὸ
 πρῶτον ψεῦδος. ἢ γὰρ ἐκ τῶν δύο προτάσεων ἢ
 ἐκ πλειόνων πᾶς ἐστὶ συλλογισμός. εἰ μὲν οὖν ἐκ
 τῶν δύο, τούτων ἀνάγκη τὴν ἑτέραν ἢ καὶ ἀμφο-
 20 τέρας εἶναι ψευδεῖς· ἐξ ἀληθῶν γὰρ οὐκ ἦν ψευδὴς
 συλλογισμός. εἰ δ' ἐκ πλειόνων, οἷον τὸ μὲν Γ διὰ
 τῶν ΑΒ, ταῦτα δὲ διὰ τῶν ΔΕΖΗ, τούτων τι ἔσται
 τῶν ἐπάνω ψεῦδος, καὶ παρὰ τοῦτο ὁ λόγος· τὸ γὰρ
 Α καὶ Β δι' ἐκείνων περαίνονται· ὥστε παρ' ἐκείνων
 τι συμβαίνει τὸ συμπέρασμα καὶ τὸ ψεῦδος.

25 XIX. Πρὸς δὲ τὸ μὴ κατασυλλογίζεσθαι παρα-
 τηρητέον, ὅταν ἄνευ τῶν συμπερασμάτων ἐρωτᾷ

upward direction ; so that since the impossible conclusion follows whether the original assumption holds or not, it cannot follow from the hypothesis. Probably the fact that when the assumption is eliminated the fallacy results none the less should be taken to mean, not that the impossible conclusion follows when some other assumption is made, but that when the original assumption is eliminated the same impossible conclusion results through the remaining premisses ; since presumably it is by no means incongruous that the same fallacy should follow from several hypotheses, *e.g.*, that the impossible conclusion ' parallel lines meet ' should follow both on the hypothesis that the interior is greater than the exterior angle and on the hypothesis that the sum of the angles of a triangle is greater than two right angles.

since the same fallacy may follow from more than one hypothesis.

XVIII. Falsity in an argument rests on the first false statement which the argument contains. Every syllogism is drawn from two or more premisses. Thus if the false argument is drawn from two premisses, one or both of these must be false ; for we have seen ^a that a false conclusion cannot be drawn from true premisses ; but if it is drawn from more than two, *e.g.*, if C is proved by means of A and B and these by means of D, E, F and G, one of these higher propositions must be false, and must be the cause of the <falsity of the> argument ; for A and B are inferred by means of those propositions. Thus it is from some one of them that the conclusion, *i.e.* the fallacy, results.

Falsity in arguments.

XIX. If we are to avoid having a syllogism constructed against us when our opponent, without disclosing the conclusions, asks us to admit the grounds

Counter-syllogisms : how to escape,

66 a

τὸν λόγον, ὅπως μὴ δοθῇ δις ταὐτὸν ἐν ταῖς προτάσεσιν, ἐπειδήπερ ἴσμεν ὅτι ἀνευ μέσου συλλογισμὸς οὐ γίνεται, μέσον δ' ἐστὶ τὸ πλεονάκις λεγόμενον. ὥς δὲ δεῖ πρὸς ἕκαστον συμπέρασμα
 20 τηρεῖν τὸ μέσον, φανερόν ἐκ τοῦ εἰδέναι ποῖον ἐν ἐκάστω σχήματι δείκνυται. τοῦτο δ' ἡμᾶς οὐ λήσεται διὰ τὸ εἰδέναι πῶς ὑπέχομεν τὸν λόγον.

Χρὴ δ' ὅπερ φυλάττεσθαι παραγγέλλομεν ἀποκρινομένους, αὐτοὺς ἐπιχειροῦντας πειρᾶσθαι λαν-
 25 θάνειν. τοῦτο δ' ἔσται πρῶτον, εἰὰ τὰ συμπεράσματα μὴ προσυλλογίζωνται ἀλλ' εἰλημμένων τῶν ἀναγκαίων ἀδηλα ἤ, ἔτι δὲ ἂν μὴ τὰ σύνεγγυς ἐρωτᾷ ἀλλ' ὅτι μάλιστα ἄμεσα.¹ οἷον ἔστω δέον συμπεραίνεισθαι τὸ Α κατὰ τοῦ Ζ· μέσα ΒΓΔΕ. δεῖ οὖν ἐρωτᾶν εἰ τὸ Α τῷ Β, καὶ πάλιν μὴ εἰ τὸ
 30 Β τῷ Γ, ἀλλ' εἰ τὸ Δ τῷ Ε, καίπειτα εἰ τὸ Β τῷ Γ,
 66 b καὶ οὕτω τὰ λοιπά. καὶν δι' ἐνὸς μέσου γίγνηται ὁ συλλογισμὸς, ἀπὸ τοῦ μέσου ἄρχεσθαι· μάλιστα γὰρ ἂν οὕτω λανθάνοι τὸν ἀποκρινόμενον.

XX. Ἐπεὶ δ' ἔχομεν πότε καὶ πῶς ἐχόντων τῶν
 3 ὁρῶν γίνεται συλλογισμὸς, φανερόν καὶ πότ' ἔσται καὶ πότ' οὐκ ἔσται ἔλεγχος. πάντων μὲν γὰρ συγχωρουμένων ἢ ἐναλλάξ τιθεμένων τῶν ἀποκρίσεων (οἷον τῆς μὲν ἀποφατικῆς τῆς δὲ κατα-

¹ ἄμεσα B¹C¹: τὰ μέσα uolgo.

• Cf. 40 b 29—41 a 20.

PRIOR ANALYTICS, II. XIX-XX

of his argument, we must be careful that we do not grant him the same term twice over in the premisses ; since we know that without a middle term there cannot be a syllogism,^a and the middle term is that which occurs more than once. In what way we should watch for the middle term with reference to each conclusion is evident from our knowledge of what form the proof takes in each figure ; this will not escape us, because we know how we are maintaining the argument.

This same procedure against which we have been warning students when they are on the defensive in argument they should try to adopt unobtrusively when they assume the offensive. This will be possible, firstly, if they avoid drawing the conclusions of preliminary syllogisms and leave them obscure, after making the necessary assumptions ; and secondly, if the points asked to be conceded are not closely associated, but are as far as possible unconnected by middle terms. *E.g.*, let it be required to establish that A is predicated of F, the middle terms being B, C, D and E. Then we should ask whether A applies to B ; and next, not whether B applies to C, but whether D applies to E, and then whether B applies to C ; and so on with the remaining terms. If the syllogism is effected by means of one middle term, we should begin with the middle ; for in this way the effect of the concession will be least apparent.

XX. Since we comprehend when and with what combinations of terms a syllogism results, it is evident also when refutation will or will not be possible. Refutation may take place whether all the propositions are conceded or the answers alternate (*i.e.* one being negative and one affirmative) ; for we have

and how to
employ
them.

Refutation.

66 b

φατικῆς) ἐγχωρεῖ γίγνεσθαι ἔλεγχον· ἦν γὰρ συλλογισμὸς καὶ οὕτω καὶ ἐκείνως ἐχόντων τῶν ὄρων·
 10 ὥστ' εἰ τὸ κείμενον εἴη¹ ἐναντίον τῷ συμπεράσματι, ἀνάγκη γίγνεσθαι ἔλεγχον· ὁ γὰρ ἔλεγχος ἀντιφάσεως συλλογισμὸς. εἰ δὲ μηδὲν συγχωροῖτο, ἀδύνατον γίγνεσθαι ἔλεγχον· οὐ γὰρ ἦν συλλογισμὸς πάντων τῶν ὄρων στερητικῶν ὄντων, ὥστ' οὐδ' ἔλεγχος· εἰ μὲν γὰρ ἔλεγχος, ἀνάγκη συλλογισμὸν
 15 εἶναι, συλλογισμοῦ δ' οἷτος οὐκ ἀνάγκη ἔλεγχον. ὡσαύτως δὲ καὶ εἰ μηδὲν τεθείη κατὰ τὴν ἀποκρίσιν ἐν ὅλῳ· ὁ γὰρ αὐτὸς ἔσται διορισμὸς ἐλέγχου καὶ συλλογισμοῦ.

XXI. Συμβαίνει δ' ἐνίοτε, καθάπερ ἐν τῇ θέσει τῶν ὄρων ἀπατώμεθα, καὶ κατὰ τὴν ὑπόληψιν
 20 γίγνεσθαι τὴν ἀπάτην, οἷον εἰ ἐνδέχεται τὸ αὐτὸ πλείοσι πρῶτοις² ὑπάρχειν, καὶ τὸ μὲν λεληθέναι τινὰ καὶ οἶεσθαι μηδενὶ ὑπάρχειν, τὸ δὲ εἶδέναι. ἔστω γὰρ τὸ Α τῷ Β καὶ τῷ Γ καθ' αὐτὰ ὑπάρχον, καὶ ταῦτα παντὶ τῷ Δ ὡσαύτως· εἰ δὴ τῷ μὲν Β τὸ Α παντὶ οἶεται ὑπάρχειν καὶ τοῦτο τῷ Δ, τῷ δὲ
 25 Γ τὸ Α μηδενὶ καὶ τοῦτο τῷ Δ παντί, τοῦ αὐτοῦ κατὰ ταῦτόν ἐξει ἐπιστήμην καὶ ἄνοιαν. πάλιν εἰ τις ἀπατηθεῖη περὶ τὰ ἐκ τῆς αὐτῆς συστοιχίας, οἷον εἰ τὸ Α ὑπάρχει τῷ Β, τοῦτο δὲ τῷ Γ καὶ τὸ Γ τῷ Δ, ὑπολαμβάνοι δὲ τὸ Α παντὶ τῷ Β ὑπάρχειν
 30 καὶ πάλιν μηδενὶ τῷ Γ· ἅμα γὰρ εἴσεται τε καὶ οὐχ ὑπολήφεται ὑπάρχειν. ἄρ' οὖν οὐδὲν ἄλλο ἀξιοῖ ἐκ

¹ εἴη mn²: ἡ uolgo.² πρῶτοις] πρῶτους B²C²m.

* i.e. a syllogism may have both premisses affirmative or one affirmative and one negative.

^b 41 b 6.

seen that a syllogism results both with the former and with the latter arrangement of terms.^a Hence if the admitted proposition is contrary to the conclusion, refutation must result, since refutation is a syllogism which proves the contradictory conclusion. If, however, nothing is conceded, refutation is impossible; for we have seen ^b that when all the terms ^c are negative there is no syllogism, and therefore no refutation either. For refutation necessarily implies a syllogism, but a syllogism does not necessarily imply refutation. So too if the answer posits no universal relation; for the same definition will apply to refutation as to syllogism.^d

XXI. Just as we are sometimes mistaken in setting out the terms, so it sometimes happens that a mistake occurs in our thought about them; *e.g.*, if the same predicate may apply to more than one subject immediately, and someone, knowing one subject, forgets the other and thinks that the predicate applies to none of it. For example, let A be applicable to B and C *per se*, and let B and C apply in the same way to all D. Then if he thinks that A applies to all B and B to D, but that A applies to no C and C applies to all D, he will have knowledge and ignorance of the same thing in relation to the same thing. So again supposing that someone should be mistaken about terms in the same series,^e *e.g.*, if A applies to B, B to C and C to D, and should suppose that A applies to all B but on the contrary to no C; he will at the same time know that it applies and not think that it does so. Does he then actually profess, as a result

How error arises in judgements.

Two apparent examples of contrary thought.

^a *i.e.* both premisses.

^d 41 b 6.

^e *i.e.* terms contained in the same genus and subordinate one to another. Cf. Bonitz, *Index Arist.* 736 b 33.

66 b

τούτων ἢ ὁ ἐπίσταται, τοῦτο μὴ ὑπολαμβάνειν; ἐπίσταται γάρ πως ὅτι τὸ Α τῷ Γ ὑπάρχει διὰ τοῦ Β, ὡς τῇ καθόλου τὸ κατὰ μέρος, ὥστε ὁ πως ἐπίσταται, τοῦτο ὅλως ἀξιοῖ μὴ ὑπολαμβάνειν· ὅπερ ἀδύνατον.

- α' Ἐπὶ δὲ τοῦ πρότερον λεχθέντος, εἰ μὴ ἐκ τῆς αὐτῆς συστοιχίας τὸ μέσον, καθ' ἑκάτερον μὲν τῶν μέσων ἀμφοτέρας τὰς προτάσεις οὐκ ἐγγχωρεῖ ὑπολαμβάνειν, οἷον τὸ Α τῷ μὲν Β παντὶ τῷ δὲ Γ μηδενί, ταῦτα δ' ἀμφοτέρα παντὶ τῷ Δ. συμβαίνει γὰρ ἢ ἀπλῶς ἢ ἐπὶ τι ἐναντίαν λαμβάνεσθαι τὴν
 40 πρώτην πρότασιν. εἰ γὰρ ὦ τὸ Β ὑπάρχει, παντὶ
 67 α' τὸ Α ὑπολαμβάνει ὑπάρχειν, τὸ δὲ Β τῷ Δ οἶδε, καὶ ὅτι τῷ Δ τὸ Α οἶδεν· ὥστ' εἰ πάλιν ὦ τὸ Γ μηδενὶ οἶεται τὸ Α ὑπάρχειν, ὦ τὸ Β τινὶ ὑπάρχει, τούτῳ οὐκ οἶεται τὸ Α ὑπάρχειν. τὸ δὲ παντὶ οἰόμενον ὦ τὸ Β πάλιν τινὶ μὴ οἰεσθαι ὦ τὸ Β ἢ
 β' ἀπλῶς ἢ ἐπὶ τι ἐναντίον ἐστίν.

Οὕτω μὲν οὖν οὐκ ἐνδέχεται ὑπολαβεῖν· καθ' ἑκάτερον δὲ τὴν μίαν ἢ κατὰ θάτερον ἀμφοτέρας οὐδὲν κωλύει, οἷον τὸ Α παντὶ τῷ Β καὶ τὸ Β τῷ Δ, καὶ πάλιν τὸ Α μηδενὶ τῷ Γ. ὁμοία γὰρ ἡ τοιαύτη ἀπάτη καὶ ὡς ἀπατώμεθα περὶ τὰ ἐν μέρει,
 10 οἷον εἰ τῷ Β παντὶ τὸ Α ὑπάρχει τὸ δὲ Β τῷ Γ παντί, τὸ Α παντὶ τῷ Γ ὑπάρξει. εἰ οὖν τις οἶδεν ὅτι τὸ Α ὦ τὸ Β ὑπάρχει παντί, οἶδε καὶ ὅτι τῷ Γ. ἀλλ' οὐδὲν κωλύει ἀγνοεῖν τὸ Γ ὅτι ἔστιν, οἷον εἰ τὸ μὲν Α δύο ὄρθαι τὸ δ' ἐφ' ὦ Β τρίγωνον τὸ δ'

* 1. 22 *supra*.* *Viz. C.*

of this, that he does not think that which he knows ? For he knows in a sense that A applies to C through B, as the particular applies to the universal ; so that he professes not to think at all that which he in a sense knows ; which is impossible.

With regard to the first case which we mentioned,^a where the middle term does not belong to the same series, it is impossible to think both the premisses with reference to each of the middle terms : *e.g.*, to think that A applies to all B but to no C, and that both the latter apply to all D ; for it follows that the first premiss is contrary, either wholly or in part, to the other. For if anyone supposes that A applies to all of that to which B applies, and knows that B applies to D, he knows also that A applies to D. Hence if, again, he thinks that A applies to none of that to which C applies, he does not think that A applies to some of that ^b to which B applies. But to think that it applies to all of that to which B applies, and then again to think that it does not apply to some of that to which B applies, implies a contrariety, either absolute or partial.

It is impossible to hold opinions which are really contrary.

Thus it is not possible to think in this way ; but there is no reason why one should not think one premiss with reference to each middle term, or both premisses with reference to one : *e.g.*, think that A applies to all B and B to D, and again that A applies to no C. Such a mistake is similar to that which we make with respect to particular things. *E.g.*, if A applies to all B and B to all C, A will apply to all C. Then if someone knows that A applies to all of that to which B applies, he knows also that it applies to C. But there is no reason why he should not be ignorant that C exists : *e.g.*, if A stands for ' two right angles,'

Error arises from failure to relate knowledge of the particular to knowledge of the universal.

67 ^a

15 ἐφ' ᾧ Γ αἰσθητὸν τρίγωνον· ὑπολάβοι γὰρ ἂν τις μὴ εἶναι τὸ Γ, εἰδὼς ὅτι πᾶν τρίγωνον ἔχει δύο ὀρθάς, ὥσθ' ἅμα εἴσεται καὶ ἀγνοήσῃ ταυτόν. τὸ γὰρ εἰδέναι πᾶν τρίγωνον ὅτι δύο ὀρθαῖς οὐχ ἀπλοῦν ἐστίν, ἀλλὰ τὸ μὲν τῷ τὴν καθόλου ἔχειν ἐπιστήμην τὸ δὲ τὴν καθ' ἑκαστον. οὕτω μὲν οὖν
20 ὡς τῇ καθόλου οἶδε τὸ Γ ὅτι δύο ὀρθαί, ὡς δὲ τῇ καθ' ἑκαστον οὐκ οἶδεν, ὥστ' οὐχ ἔξει τὰς ἐναντίας.

Ὁμοίως δὲ καὶ ὁ ἐν τῷ Μένωνι λόγος ὅτι ἡ μάθησις ἀνάμνησις. οὐδαμοῦ γὰρ συμβαίνει προεπίστασθαι τὸ καθ' ἑκαστον, ἀλλ' ἅμα τῇ ἐπαγωγῇ λαμβάνειν τὴν τῶν κατὰ μέρος ἐπιστήμην ὥσπερ
25 ἀναγνωρίζοντας. ἔνα γὰρ εὐθὺς ἴσμεν, ὅλον ὅτι δύο ὀρθαῖς, εἰάν εἰδῶμεν ὅτι τρίγωνον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.

Τῇ μὲν οὖν καθόλου θεωροῦμεν τὰ ἐν μέρει, τῇ δ' οἰκεία οὐκ ἴσμεν, ὥστ' ἐνδέχεται καὶ ἀπατάσθαι περὶ αὐτά, πλὴν οὐκ ἐναντίως, ἀλλ' ἔχειν μὲν τὴν
30 καθόλου ἀπατάσθαι δὲ τῇ κατὰ μέρος.

Ὁμοίως οὖν καὶ ἐπὶ τῶν προειρημένων· οὐ γὰρ ἐναντία ἡ κατὰ τὸ μέσον ἀπάτη τῇ κατὰ τὸν συλλογισμὸν ἐπιστήμῃ, οὐδ' ἡ καθ' ἑκάτερον τῶν

* i.e. a given drawing or other representation of a triangle.

† i.e. knowledge of the particular object.

‡ That is, the universal rule may be recognized apart from special knowledge of all the particular instances of it. Ignorance of the latter is not incompatible with knowledge of the former.

§ Plato, *Meno* 81. The point of the comparison is that on the Platonic view the study of particulars reawakens our latent knowledge of the universal.

¶ Sc. of immediate apprehension.

‡ 66 b 20-30.

B for 'triangle' and C for 'sensible triangle,'^a because a man might suppose that C does not exist, although he knows that every triangle has the sum of its angles equal to two right angles; so that he will at once know and not know the same thing. For to know that every triangle has the sum of its angles equal to two right angles has more than one meaning; it consists either in having universal or in having particular knowledge.^b Thus by universal knowledge he knows that C is equal to two right angles, but he does not know it by particular knowledge; and therefore his ignorance will not be contrary to his knowledge.^c

Similarly too with the theory in the *Meno*^d that learning is recollection. For in no case do we find that we have previous knowledge of the individual, but we do find that in the process of induction we acquire knowledge of particular things just as though we could remember them; for there are some things which we know immediately: *e.g.*, if we know that X is a triangle we know that the sum of its angles is equal to two right angles. Similarly too in all other cases.^e

The Platonic doctrine of *ἀνάμνησις* criticized.

Thus whereas we observe particular things by universal knowledge, we do not know them by the knowledge peculiar to them. Hence it is possible to be mistaken about them, not because we have contrary knowledge about them, but because, although we have universal knowledge of them, we are mistaken in our particular knowledge.

Similarly too in the cases mentioned above.^f The mistake with regard to the middle term is not contrary to the knowledge obtained by the syllogism, nor are the suppositions with regard to the two middle

Error may arise from the failure to consider both premisses in

- 67^a μέσων ὑπόληψις. οὐδὲν δὲ κωλύει εἰδότες καὶ ὅτι
 τὸ Α ὁλῶ τῷ Β ὑπάρχει καὶ πάλιν τοῦτο τῷ Γ,
 83 οἰηθῆναι μὴ ὑπάρχειν τὸ Α τῷ Γ, οἷον ὅτι πᾶσα
 ἡμίονος ἄτοκος καὶ αὕτη ἡμίονος οἰεσθαι κύειν
 ταύτην· οὐ γὰρ ἐπίσταται ὅτι τὸ Α τῷ Γ μὴ συν-
 θεωρῶν τὸ καθ' ἑκάτερον. ὥστε δῆλον ὅτι καὶ εἰ
 τὸ μὲν οἶδε τὸ δὲ μὴ οἶδεν ἀπατηθήσεται· ὅπερ
 ἔχουσιν αἱ καθόλου πρὸς τὰς κατὰ μέρος ἐπιστήμας.
- 67^b οὐδὲν γὰρ τῶν αἰσθητῶν ἔξω τῆς αἰσθήσεως γενό-
 μενον ἴσμεν, οὐδ' ἂν ἡσθημένοι τυγχάνωμεν, εἰ μὴ
 ὡς τῷ καθόλου καὶ τῷ ἔχειν τὴν οἰκείαν ἐπιστήμην,
 ἀλλ' οὐχ ὡς τῷ ἐνεργεῖν. τὸ γὰρ ἐπίστασθαι
 λέγεται τριχῶς, ἢ ὡς τῇ καθόλου ἢ ὡς τῇ οἰκείᾳ
 5 ἢ ὡς τῷ ἐνεργεῖν, ὥστε καὶ τὸ ἡπατῆσθαι τοσ-
 αυταχῶς.

Οὐδὲν οὖν κωλύει καὶ εἰδέναι καὶ ἡπατῆσθαι περὶ
 ταῦτό, πλὴν οὐκ ἐναντίως. ὅπερ συμβαίνει καὶ τῷ
 καθ' ἑκατέραν εἰδότες τὴν πρότασιν καὶ μὴ ἐπισκεμ-
 μένῳ πρότερον· ὑπολαμβάνων γὰρ κύειν τὴν ἡμί-
 10 ονον οὐκ ἔχει τὴν κατὰ τὸ ἐνεργεῖν ἐπιστήμην, οὐδ'
 αὖ διὰ τὴν ὑπόληψιν ἐναντίαν ἀπάτην τῇ ἐπιστήμῃ·
 συλλογισμὸς γὰρ ἢ ἐναντία ἀπάτη τῇ καθόλου.

Ὁ δ' ὑπολαμβάνων τὸ ἀγαθὸν εἶναι κακὸν εἶναι

^a We may have knowledge of a particular object which we have seen, but if we are not now aware of the object we are not exercising that knowledge.

^b This apparently means that if the error in question were really contrary to the man's knowledge, he would have to know not only that all mules are sterile but also that no mules are sterile, and his judgement that the particular mule is in foal would depend syllogistically upon the latter premiss. In

terms contrary. There is no reason why a man who knows both that A applies to the whole of B and again that B applies to C should not think that A does not apply to C : *e.g.*, if he knows that every mule is sterile, and that X is a mule, he may think that X is in foal ; because he does not comprehend that A applies to C, unless he considers both premisses in conjunction. Hence it is clear that he will also be mistaken if he knows the one but not the other ; and this is just the relation of universal to particular knowledge. For we do not know any object of sense when it occurs outside our sensation—not even if we have actually perceived it—except by universal knowledge together with the possession, but not the actuality,^a of the knowledge proper to that object. For there are three ways in which we can be said to know an object : by universal knowledge ; by the knowledge proper to the object ; and in actuality. Hence we can be said to be mistaken in as many different ways.

Thus there is no reason why one should not both know and be mistaken about the same thing ; only not in a contrary sense. Indeed this is just what happens in the case of the man who only knows the premisses in disjunction and has not previously considered the question ; for in supposing that the mule is in foal he does not possess actual knowledge, yet at the same time this supposition does not make his mistake contrary to his knowledge ; for the mistake contrary to knowledge of the universal is a syllogism.^b

On the other hand he who thinks that the essence of good is the essence of bad will think that the same reality, however, his error depends not upon syllogism but upon faulty perception.

67 b

τὸ αὐτὸ ὑπολήφεται ἀγαθῷ εἶναι καὶ κακῷ. ἔστω
 γὰρ τὸ μὲν ἀγαθῷ εἶναι ἐφ' οὗ Α, τὸ δὲ κακῷ εἶναι
 15 ἐφ' οὗ Β, πάλιν δὲ τὸ ἀγαθῷ εἶναι ἐφ' οὗ Γ. ἐπεὶ
 οὖν ταυτόν ὑπολαμβάνει τὸ Β καὶ τὸ Γ, καὶ εἶναι
 τὸ Γ τὸ Β ὑπολήφεται, καὶ πάλιν τὸ Β τὸ Α εἶναι
 ὡσαύτως, ὥστε καὶ τὸ Γ τὸ Α. ὥσπερ γὰρ εἰ ἦν
 ἀληθὲς καθ' οὗ τὸ Γ τὸ Β καὶ καθ' οὗ τὸ Β τὸ Α,
 20 καὶ κατὰ τοῦ Γ τὸ Α ἀληθὲς ἦν, οὕτω καὶ ἐπὶ τοῦ
 ὑπολαμβάνειν. ὁμοίως δὲ καὶ ἐπὶ τοῦ εἶναι ταύτου
 γὰρ οἷτος τοῦ Γ καὶ Β, καὶ πάλιν τοῦ Β καὶ Α, καὶ
 τὸ Γ τῷ Α ταυτόν ἦν· ὥστε καὶ ἐπὶ τοῦ δοξάζειν
 ὁμοίως. ἄρ' οὖν τοῦτο μὲν ἀναγκαῖον, εἰ τις δώσει
 τὸ πρῶτον; ἀλλ' ἴσως ἐκεῖνο ψεῦδος, τὸ ὑπολαμ-
 25 βάνειν τινὰ κακῷ εἶναι τὸ ἀγαθῷ εἶναι, εἰ μὴ κατὰ
 συμβεβηκός· πολλαχῶς γὰρ ἐγχωρεῖ τοῦθ' ὑπο-
 λαμβάνειν. ἐπισκεπτέον δὲ τοῦτο βέλτιον.

XXII. Ὅταν δ' ἀντιστρέφῃ τὰ ἄκρα, ἀνάγκη καὶ
 τὸ μέσον ἀντιστρέφειν πρὸς ἅμφω. εἰ γὰρ τὸ Α
 κατὰ τοῦ Γ διὰ τοῦ Β ὑπάρχει, εἰ ἀντιστρέφει καὶ
 30 ὑπάρχει, ὥ τὸ Α, παντὶ τὸ Γ, καὶ τὸ Β τῷ Α
 ἀντιστρέφει, καὶ ὑπάρχει, ὥ τὸ Α, παντὶ τὸ Β διὰ
 μέσου τοῦ Γ, καὶ τὸ Γ τῷ Β ἀντιστρέφει διὰ μέσου
 τοῦ Α. καὶ ἐπὶ τοῦ μὴ ὑπάρχειν ὡσαύτως, οἷον εἰ
 τὸ Β τῷ Γ ὑπάρχει τῷ δὲ Β τὸ Α μὴ ὑπάρχει, οὐδὲ
 τὸ Α τῷ Γ οὐχ ὑπάρξει. εἰ δὴ τὸ Β τῷ Α ἀντι-
 35 στρέφει, καὶ τὸ Γ τῷ Α ἀντιστρέφει. ἔστω γὰρ τὸ

^a There is no obvious reference either here or in l. 22.

^b The obligation is not discharged in the logical works, but cf. *Met.* IV. (Γ) iv.

^c i.e. have the same extension and so are interchangeable.

thing is the essence of good and the essence of bad. Let A stand for 'essence of good,' B for 'essence of bad,' and C again for 'essence of good.' Then since he thinks B and C to be identical, he will also think that C is B, and again in the same way that B is A, and therefore also that C is A (for just as we saw^a that if B is true of C and A of B, A is also true of C, so it is in respect of thinking. Similarly too in respect of being; for we have seen that if C and B are identical and again B and A are identical, C is also identical with A. Therefore the same holds in the case of opinion). Is this then a necessary consequence, if one grants the original assumption? But presumably it is false that anyone should think that the essence of good is the essence of bad, except accidentally; for there are several senses in which this may be thought. But we must consider this question in greater detail.^b

must rest upon a misapprehension which is practically incredible.

XXII. When the extreme terms are convertible,^c the middle term must also be convertible with both of them. For supposing that A applies as predicate to C through B, if this relation is convertible and C applies to all of that to which A applies, then B is also convertible with A, and applies through C as middle term to all of that to which A applies; and C is convertible with B through A as middle term.^d So too when the conclusion is negative; *e.g.*, if B applies to C but A does not apply to B, neither will A apply to C. Then if B is convertible with A, C will also be convertible with A. For let B not be appli-

Conversion of terms.
(1) Affirmative syllogisms.

(2) Negative syllogisms.

^a The syllogisms are as follows:

(a) BaA	(b) CaB	(c') AaC
(b) CaB	(c') AaC	(a) BaA
(c) CaA	(a') AaB	(b') BaC

67 b

B μὴ ὑπάρχον τῷ Α· οὐδ' ἄρα τὸ Γ· παντὶ γὰρ τῷ Γ τὸ Β ὑπῆρχεν. καὶ εἰ τῷ Β τὸ Γ ἀντιστρέφει, καὶ τῷ Α¹ ἀντιστρέφει· καθ' οὗ γὰρ ἅπαντος τὸ Β, καὶ τὸ Γ. καὶ εἰ τὸ Γ πρὸς τὸ Α ἀντιστρέφει, καὶ
 68 a τὸ Β² ἀντιστρέφει [πρὸς τὸ Α].³ ὥ γὰρ τὸ Β τὸ Γ, ὥ δὲ τὸ Α τὸ Γ⁴ οὐχ ὑπάρχει. καὶ μόνον τοῦτο ἀπὸ τοῦ συμπεράσματος ἄρχεται, τὰ δ' ἄλλα οὐχ ὁμοίως καὶ ἐπὶ τοῦ κατηγορικοῦ συλλογισμοῦ.

Πάλιν εἰ τὸ Α καὶ τὸ Β ἀντιστρέφει καὶ τὸ Γ καὶ
 6 τὸ Δ ὡσαύτως, ἅπαντι δ' ἀνάγκη τὸ Α ἢ τὸ Γ ὑπάρχειν, καὶ τὸ Β καὶ Δ οὕτως ἔξει ὥστε παντὶ θάτερον ὑπάρχειν. ἐπεὶ γὰρ ὥ τὸ Α τὸ Β, καὶ ὥ τὸ Γ τὸ Δ, παντὶ δὲ τὸ Α ἢ τὸ Γ καὶ οὐχ ἅμα, φανερόν ὅτι καὶ τὸ Β ἢ τὸ Δ παντὶ καὶ οὐχ ἅμα. οἶον εἰ τὸ ἀγέννητον ἀφθαρτον καὶ τὸ ἀφθαρτον
 10 ἀγέννητον, ἀνάγκη τὸ γινόμενον φθαρτὸν καὶ τὸ φθαρτὸν γεγενῆσθαι· δύο γὰρ συλλογισμοὶ σύγκεινται. πάλιν εἰ παντὶ μὲν τὸ Α ἢ τὸ Β καὶ τὸ Γ ἢ τὸ Δ, ἅμα δὲ μὴ ὑπάρχει, εἰ ἀντιστρέφει τὸ Α καὶ τὸ Γ, καὶ τὸ Β καὶ τὸ Δ ἀντιστρέφει. εἰ γὰρ τινὶ μὴ ὑπάρχει τὸ Β ὥ τὸ Δ, δῆλον ὅτι τὸ Α ὑπάρχει. εἰ

¹ τῷ Α] τὸ Α Α¹Β¹cu: τῷ Α τὸ Β Pacius.

² ἀντιστρέφει, καὶ τὸ Β] ἀντιστρέφει (καὶ τὸ Β), καὶ τὸ Β Jenkinson.

³ πρὸς τὸ Α f, πρὸς τὸ Α δηλονότι supra lineam C¹: om. cet.

⁴ τὸ Α, τὸ Γ Α²Β², Philoponus, Pacius: τὸ Γ, τὸ Α Α¹Β¹Cnmf.

* AeC may be proved by a syllogism in Camestres, but cf. the following note.

^b It seems better to keep the ms. reading τῷ Α than to accept τῷ Α τὸ Β on the authority of Pacius. His reading requires a proof that no Α is Β: and whereas his argument is generally condemned as too complicated, the syllogism in

cable to A ; then neither will C be applicable, for B was assumed to apply to all C.^a Moreover, if C is convertible with B, it is also convertible with A ; for where B is predicated of all, so too is C.^b Again, if C is convertible in relation to A, so too is B ; for C applies to that to which B applies, but does not apply to that to which A applies. This is the only example which starts from the conclusion ; the others differ in this respect from the affirmative syllogism.

Again, if A and B are convertible, and likewise C and D, and either A or C must apply to everything, B and D must also be so related that one or the other applies to everything. For since B applies to that to which A applies, and D to that to which C applies, and either A or C but not both at once must apply to everything : it is evident that either B or D, but not both at once, must apply to everything. *E.g.*, if the ungenerated is imperishable and the imperishable ungenerated, that which has been generated must be perishable, and that which is perishable must have been generated ; for we have here the product of two syllogisms.^c Again, if either A or B (but not both at once) applies to everything, and likewise either C or D, if A and C are convertible, so are B and D. For if B does not apply to something to which D applies,

Conversion
of pairs of
exhaustive
alternatives.

Celarent offered by modern expositors only proves the converse, viz. that no B is A. Hence although the proof which the ms. reading implies, that no A is C, is unattainable by syllogism, I am disposed to agree with Waitz and Maier that Aristotle bases his argument simply upon the interchangeability of the convertible terms B and C. So in the next example also.

* Since this example illustrates the case which follows and not that which precedes it, either the text or Aristotle's thought appears to be in disorder. Hence it is hard to say what the 'two syllogisms' are ; but *cf.* the next note.

68 a

15 δὲ τὸ Α, καὶ τὸ Γ· ἀντιστρέφει γάρ· ὥστε ἅμα τὸ Γ καὶ Δ. τοῦτο δ' ἀδύνατον.

Ὅταν δὲ τὸ Α ὅλῃ τῷ Β καὶ τῷ Γ ὑπάρχῃ καὶ μηδενὸς ἄλλου κατηγορῇται, ὑπάρχῃ δὲ καὶ τὸ Β παντὶ τῷ Γ, ἀνάγκη τὸ Α καὶ Β ἀντιστρέφειν· ἐπεὶ γὰρ κατὰ μόνων τῶν ΒΓ λέγεται τὸ Α, κατηγο-
 20 ρεῖται δὲ τὸ Β καὶ αὐτὸ αὐτοῦ καὶ τοῦ Γ, φανερόν ὅτι καθ' ὧν τὸ Α καὶ τὸ Β λεχθήσεται πάντων πλὴν αὐτοῦ τοῦ Α.

Πάλιν ὅταν τὸ Α καὶ τὸ Β ὅλῃ τῷ Γ ὑπάρχῃ, ἀντιστρέφῃ δὲ τὸ Γ τῷ Β, ἀνάγκη τὸ Α παντὶ τῷ Β ὑπάρχειν· ἐπεὶ γὰρ παντὶ τῷ Γ τὸ Α, τὸ δὲ
 25 Γ τῷ Β διὰ τὸ ἀντιστρέφειν, καὶ τὸ Α παντὶ τῷ Β ὑπάρξει.

Ὅταν δὲ δυοῖν οἷτοιν τὸ Α τοῦ Β αἰρετώτερον ᾗ, ὄντων ἀντικειμένων, καὶ τὸ Δ τοῦ Γ ὡσαύτως, εἰ αἰρετώτερα τὰ ΑΓ τῶν ΒΔ, τὸ Α τοῦ Δ αἰρετώ-
 30 (ἀντικείμενα γάρ), καὶ τὸ Γ τοῦ Δ (καὶ γὰρ ταῦτα ἀντίκεινται). εἰ οὖν τὸ Α τῷ Δ ὁμοίως αἰρετόν, καὶ τὸ Β τῷ Γ φευκτόν· ἐκάτερον γὰρ ἐκατέρῃ ὁμοίως, φευκτόν διωκτῶ· ὥστε καὶ τὰ ἄμφω τὰ ΑΓ τοῖς ΒΔ. ἐπεὶ δὲ μᾶλλον, οὐχ οἷόν τε ὁμοίως· καὶ γὰρ ἂν τὰ ΒΔ ὁμοίως ᾗσαν. εἰ δὲ τὸ Δ τοῦ Α αἰρετώτερον, καὶ τὸ Β τοῦ Γ ἥττον φευκτόν· τὸ
 35 γὰρ ἔλαττον τῷ ἐλάττονι ἀντίκειται. αἰρετώτερον δὲ τὸ μείζον ἀγαθὸν καὶ ἔλαττον κακὸν ἢ τὸ ἔλαττον ἀγαθὸν καὶ μείζον κακόν· καὶ τὸ ἅπαν ἄρα τὸ ΒΔ αἰρετώτερον τοῦ ΑΓ· νῦν δ' οὐκ ἔστιν. τὸ Α ἄρα
 510

clearly A applies to it ; and if A applies, so does C, since they are convertible. Therefore C and D both apply at once ; but this is impossible.^a

When A applies to the whole of B and of C, and is predicated of nothing else, and B also applies to all C, A and B must be convertible. For since A is stated only of B and C, and B is predicated both of itself and of C, it is evident that B will also be stated of all subjects of which A is stated, except A itself.

Other cases of conversion

Again, when A and B apply to the whole of C, and C is convertible with B, A must apply to all B. For since A applies to all C, and C by conversion to B, A will also apply to all B.

When, of two opposite alternatives A and B, A is preferable to B, and similarly D is preferable to C, if A and C together are preferable to B and D together, A is preferable to D. For A is as much to be pursued as B is to be avoided, since they are opposites ; and similarly with C and D, since they also are opposites. Then if A is as much to be chosen as D, B is as much to be avoided as C ; since each is equally with each to be pursued or avoided respectively. Therefore the combination AC is equally desirable with the combination BD. But since AC is preferable, it cannot be equally desirable, for if so, BD would be equally desirable. And if D is preferable to A, B will also be less to be avoided than C ; for the lesser is opposed to the lesser extreme ; and the greater good and lesser evil will be preferable to the lesser good and greater evil. Therefore the combination BD will be preferable to AC. But in

Preferability of combinations of opposite alternatives.

^a Sc. 'and therefore B applies to all D. Similarly D applies to all B. Therefore B and D are convertible.'

68 a

αἰρετώτερον τοῦ Δ, καὶ τὸ Γ ἄρα τοῦ Β ἦττον
φευκτόν.

40 Εἰ δὴ ἐλοιτο πᾶς ὁ ἔρων κατὰ τὸν ἔρωτα τὸ Α
τὸ οὕτως ἔχειν ὥστε χαρίζεσθαι καὶ τὸ μὴ χαρίζε-
σθαι τὸ ἐφ' οὗ Γ, ἢ τὸ χαρίζεσθαι τὸ ἐφ' οὗ Δ καὶ

68 b τὸ μὴ τοιοῦτον εἶναι ὅλον χαρίζεσθαι τὸ ἐφ' οὗ Β,
δῆλον ὅτι τὸ Α τὸ τοιοῦτον εἶναι αἰρετώτερόν ἐστιν
ἢ τὸ χαρίσασθαι.¹ τὸ ἄρα φιλεῖσθαι τῆς συνουσίας
αἰρετώτερον κατὰ τὸν ἔρωτα. μᾶλλον ἄρα ὁ ἔρως
5 ἐστὶ τῆς φιλίας ἢ τοῦ συνεῖναι· εἰ δὲ μάλιστα τού-
του, καὶ τέλος τοῦτο. τὸ ἄρα συνεῖναι ἢ οὐκ ἐστὶν
ὅλως ἢ τοῦ φιλεῖσθαι ἕνεκεν· καὶ γὰρ αἱ ἄλλαι
ἐπιθυμίαι καὶ τέχναι οὕτως.¹

XXIII. Πῶς μὲν οὖν ἔχουσιν οἱ ὅροι κατὰ τὰς
ἀντιστροφὰς καὶ τὸ φευκτότεροι ἢ αἰρετώτεροι²
10 εἶναι, φανερόν· ὅτι δ' οὐ μόνον οἱ διαλεκτικοὶ καὶ
ἀποδεικτικοὶ συλλογισμοὶ διὰ τῶν προειρημένων
γίνονται σχημάτων, ἀλλὰ καὶ οἱ ῥητορικοὶ καὶ
ἀπλῶς ἡττισοῦν πίστις καὶ ἡ καθ' ὅποιαν οὖν μέθ-
οδον, νῦν ἂν εἴη λεκτέον· ἅπαντα γὰρ πιστεύομεν ἢ
διὰ συλλογισμοῦ ἢ ἐξ ἐπαγωγῆς.

15 Ἐπαγωγή μὲν οὖν ἐστὶ καὶ ὁ ἐξ ἐπαγωγῆς
συλλογισμὸς τὸ διὰ τοῦ ἐτέρου θάτερον ἄκρον τῷ
μέσῳ συλλογίσασθαι, ὅλον εἰ τῶν ΑΓ μέσον τὸ Β,
διὰ τοῦ Γ δεῖξαι τὸ Α τῷ Β ὑπάρχειν· οὕτω γὰρ
ποιούμεθα τὰς ἐπαγωγάς. ὅλον ἔστω τὸ Α μακρό-
20 βιον, τὸ δ' ἐφ' ᾧ Β τὸ χολὴν μὴ ἔχον, ἐφ' ᾧ δὲ Γ

¹ χαρίζεσθαι. Amf.

² οὕτως) οὕτω γίνονται αβγδ Αη¹.

³ φευκτότεροι ἢ (ἢ καὶ C) αἰρετώτεροι ABC: αἰρετώτερον ἢ
φευκτότερον mlf, Bekker: αἰρετώτεροι ἢ φευκτότεροι n¹.

* For the distinction between dialectical and demonstra-
tive reasoning cf. 24 a 22.

fact it is not. Therefore A is preferable to D, and therefore C is less to be avoided than B.

If then every lover under the influence of his love would prefer his beloved to be disposed to gratify him (A) without doing so (C), rather than gratify him (D) without being inclined to do so (B), clearly A—that the beloved should be so inclined—is preferable to the act of gratification. Therefore in love to have one's affection returned is preferable to intercourse with the beloved. Therefore love aims at affection rather than at intercourse; and if affection is the principal aim of love, it is also the *end* of love. Therefore intercourse is either not an end at all, or only with a view to receiving affection. The same principle, indeed, governs all other desires and arts.

XXIII. It is evident, then, how the terms are conditioned as regards conversions and as representing degrees of preferability and the reverse. We must now observe that not only dialectical^a and demonstrative syllogisms are effected by means of the figures already described, but also rhetorical^b syllogisms and in general every kind of mental conviction, whatever form it may take. For all our beliefs are formed either by means of syllogism or from induction.

All convictions are reached either by syllogism or by induction.

Induction, or inductive reasoning, consists in establishing a relation between one extreme term and the middle term by means of the other extreme; *e.g.*, if B is the middle term of A and C, in proving by means of C that A applies to B; for this is how we effect inductions. *E.g.*, let A stand for 'long-lived,' B for 'that which has no bile' and C for the long-lived

Rules for induction.

^b For rhetorical arguments *cf.* *An. Post.* 71 a 9-11.

68 b

τὸ καθ' ἑκάστον μακρόβιον, ὅλον ἄνθρωπος καὶ ἵππος καὶ ἡμίονος. τῷ δὲ Γ ὅλῳ ὑπάρχει τὸ Α· πᾶν γὰρ τὸ ἄχολον μακρόβιον.¹ ἀλλὰ καὶ τὸ Β, τὸ μὴ ἔχον χολήν, παντὶ ὑπάρχει τῷ Γ. εἰ οὖν ἀντιστρέφει τὸ Γ τῷ Β καὶ μὴ ὑπερτείνει τὸ μέσον, 25 ἀνάγκη τὸ Α τῷ Β ὑπάρχειν· δέδεικται γὰρ πρότερον ὅτι ἂν δύο ἄττα τῷ αὐτῷ ὑπάρχη καὶ πρὸς θάτερον αὐτῶν ἀντιστρέφῃ τὸ ἄκρον, ὅτι τῷ ἀντιστρέφονται καὶ θάτερον ὑπάρξει τῶν κατηγορουμένων. δεῖ δὲ νοεῖν τὸ Γ τὸ ἐξ ἀπάντων τῶν καθ' ἑκάστον συγκεείμενον· ἡ γὰρ ἐπαγωγή διὰ πάντων.

30 Ἔστι δ' ὁ τοιοῦτος συλλογισμὸς τῆς πρώτης καὶ ἀμέσου προτάσεως· ὧν μὲν γὰρ ἔστι μέσον διὰ τοῦ μέσου ὁ συλλογισμὸς, ὧν δὲ μὴ ἔστι, δι' ἐπαγωγῆς. καὶ τρόπον τινα ἀντίκειται ἡ ἐπαγωγή τῷ συλλογισμῷ· ὁ μὲν γὰρ διὰ τοῦ μέσου τὸ ἄκρον τῷ 35 τρίτῳ δεικνυσιν, ἡ δὲ διὰ τοῦ τρίτου τὸ ἄκρον τῷ μέσῳ. φύσει μὲν οὖν πρότερος καὶ γνωριμώτερος ὁ διὰ τοῦ μέσου συλλογισμὸς, ἡμῖν δ' ἐναργέστερος ὁ διὰ τῆς ἐπαγωγῆς.

XXIV. Παράδειγμα δ' ἐστὶν ὅταν τῷ μέσῳ τὸ ἄκρον ὑπάρχον δειχθῇ διὰ τοῦ ὁμοίου τῷ τρίτῳ· 40 δεῖ δὲ καὶ τὸ μέσον τῷ τρίτῳ καὶ τὸ πρῶτον τῷ

¹ πᾶν . . . μακρόβιον an secludendum?

* Cf. *De Part. Animal.* 670 a 20, 677 a 15-b 11.

[†] This statement is a *petitio principii*; it is also irrelevant here, and should probably be excised.

[‡] Cf. *Hist. Animal.* 506 a 20, *De Part. Animal.* 676 b 26 ff.

[§] i.e. B, which is the middle term of the induction. In the sentence which follows, Aristotle has in mind (as Jenkinson points out) two syllogisms: one in *Darapti* (CaA—CaB, ∴ BiA) and one—after the conversion of BC—in *Barbara* (CaA—BaC, ∴ BaA); but in these B is still called the middle and C the extreme term.

individuals such as man and horse and mule.^a Then A applies to the whole of C [for every bileless animal is long-lived].^b But B, 'not having bile,' also applies to all C.^c Then if C is convertible with B, *i.e.*, if the middle term ^d is not wider in extension, A must apply to B. For it has been shown above ^e that if any two predicates apply to the same subject and the extreme is convertible with one of them, then the other predicate will also apply to the one which is convertible. We must, however, understand by C the sum of all the particular instances; for it is by taking all of these into account that induction proceeds.

This kind of syllogism is concerned with the first or immediate premiss.^f Where there is a middle term, the syllogism proceeds by means of the middle; where there is not, it proceeds by induction. There is a sense in which induction is opposed to syllogism, for the latter shows by the middle term that the major extreme applies to the third, while the former shows by means of the third that the major extreme applies to the middle. Thus by nature the syllogism by means of the middle is prior and more knowable; but syllogism by induction is more apparent to us.^g

XXIV. We have an Example ^h when the major extreme is shown to be applicable to the middle term by means of a term similar to the third. It must be known both that the middle applies to the third term

Induction
contrasted
with
syllogism.

Proof by
Example.

^a 68 a 21-25.

^f Induction supplies, without the aid of a middle term, the universal proposition which stands as major premiss for purposes of inference.

^g Because the abstract logical process is from universal to particular, but the human mind proceeds from particular to universal. Cf. *Met.* VII. (Z) iv. 1029 b 3-12.

^h Cf. *An. Post.* 71 a 10, *Rhet.* 1356 b 3.

- 63 b ὁμοίῳ γνώριμον εἶναι ὑπάρχον. οἷον ἔστω τὸ Α
 69 a κακόν, τὸ δὲ Β πρὸς ὁμόρους ἀναιρεῖσθαι πόλεμον,
 ἐφ' ᾧ δὲ Γ τὸ Ἀθηναίους πρὸς Θηβαίους, τὸ δ'
 ἐφ' ᾧ Δ Θηβαίους πρὸς Φωκεῖς. εἰάν οὖν βουλευμεθα
 δεῖξαι ὅτι τὸ Θηβαίους πολεμεῖν κακόν ἐστι, ληπ-
 τέον ὅτι τὸ πρὸς τοὺς ὁμόρους πολεμεῖν κακόν.
 8 τούτου δὲ πίστις ἐκ τῶν ὁμοίων, οἷον ὅτι Θηβαίους
 ὁ πρὸς Φωκεῖς. ἐπεὶ οὖν τὸ πρὸς τοὺς ὁμόρους
 κακόν, τὸ δὲ πρὸς Θηβαίους πρὸς ὁμόρους ἐστί,
 φανερόν ὅτι τὸ πρὸς Θηβαίους πολεμεῖν κακόν.
 ὅτι μὲν οὖν τὸ Β τῷ Γ καὶ τῷ Δ ὑπάρχει φανερόν
 (ἄμφω γάρ ἐστι πρὸς τοὺς ὁμόρους ἀναιρεῖσθαι
 10 πόλεμον), καὶ ὅτι τὸ Α τῷ Δ (θηβαίους γὰρ οὐ
 συνήνεγκεν ὁ πρὸς Φωκεῖς πόλεμος). ὅτι δὲ τὸ Α
 τῷ Β ὑπάρχει διὰ τοῦ Δ δειχθήσεται. τὸν αὐτὸν
 δὲ τρόπον καὶ εἰ διὰ πλειόνων τῶν ὁμοίων ἢ πίστις
 γίγνεται τοῦ μέσου πρὸς τὸ ἄκρον.

Φανερόν οὖν ὅτι τὸ παράδειγμα ἐστὶν οὔτε ὡς
 15 μέρος πρὸς ὅλον οὔτε ὡς ὅλον πρὸς μέρος, ἀλλ' ὡς
 μέρος πρὸς μέρος, ὅταν ἄμφω μὲν ἢ ὑπὸ ταυτό,
 γνώριμον δὲ θάτερον. καὶ διαφέρει τῆς ἐπαγωγῆς
 ὅτι ἢ μὲν ἐξ ἀπάντων τῶν ἀτόμων τὸ ἄκρον ἐδεί-
 κνυεν ὑπάρχειν τῷ μέσῳ καὶ πρὸς τὸ ἄκρον οὐ
 συνήπτε τὸν συλλογισμόν, τὸ δὲ καὶ συνάπτει καὶ
 οὐκ ἐξ ἀπάντων δείκνυσιν.

- 20 XXV. Ἀπαγωγή δ' ἐστὶν ὅταν τῷ μὲν μέσῳ τὸ
 πρῶτον δηλὸν ἢ ὑπάρχον τῷ δὲ ἐσχάτῳ τὸ μέσον
 ἄδηλον μὲν, ὁμοίως δὲ πιστὸν ἢ μᾶλλον τοῦ συμ-

* Example proceeds neither (like induction) from particular to general, nor (like syllogism) *vice versa*, but from one co-ordinate particular to another.

^b 68 b 27-29.

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and that the first applies to the term similar to the third. *E.g.*, let A be 'bad,' B 'to make war on neighbours,' C 'Athens against Thebes' and D 'Thebes against Phocis.' Then if we require to prove that war against Thebes is bad, we must be satisfied that war against neighbours is bad. Evidence of this can be drawn from similar examples, *e.g.*, that war by Thebes against Phocis is bad. Then since war against neighbours is bad, and war against Thebes is against neighbours, it is evident that war against Thebes is bad. Now it is evident that B applies to C and D (for they are both examples of making war on neighbours), and A to D (since the war against Phocis did Thebes no good); but that A applies to B will be proved by means of D. The same method will obtain supposing that our conviction that the middle term is related to the extreme is drawn from more than one similar term.

Thus it is evident that an example represents the relation, not of part to whole or of whole to part, but of one part to another, where both are subordinate to the same general term, and one of them is known.^a It differs from induction in that the latter, as we saw,^b shows from an examination of all the individual cases that the <major> extreme applies to the middle, and does not connect the conclusion with the <minor> extreme; whereas the example does connect it^c and does not use all the individual cases for its proof.

XXV. We have Reduction (1) when it is obvious that the first term applies to the middle, but that the middle applies to the last term is not obvious, yet nevertheless is more probable or not less probable than the conclusion; or (2) if there are not many

Example
contrasted
with syllo-
gism and
induction.

Reduction
as a means
to obtaining
greater
certainty.

^a 69 a 7.

69 a

περάσματος, ἔτι ἂν ὀλίγα ἢ τὰ μέσα τοῦ ἐσχάτου καὶ τοῦ μέσου· πάντως γὰρ ἐγγύτερον εἶναι συμβαίνει τῆς ἐπιστήμης. ὅλον ἔστω τὸ Α τὸ διδασκόν,
 25 ἐφ' οὗ Β ἐπιστήμη, τὸ Γ δικαιοσύνη. ἡ μὲν οὖν ἐπιστήμη ὅτι διδασκόν φανερόν· ἡ δ' ἀρετὴ εἰ ἐπιστήμη ἀδηλον. εἰ οὖν ὁμοίως ἢ μᾶλλον πιστόν τὸ ΒΓ τοῦ ΑΓ, ἀπαγωγὴ ἔστιν ἐγγύτερον γὰρ τοῦ ἐπίστασθαι διὰ τὸ προσειληφέναι, τὴν ΑΓ ἐπιστήμην πρότερον οὐκ ἔχοντας.

30 Ἡ πάλιν εἰ ὀλίγα τὰ μέσα τῶν ΒΓ· καὶ γὰρ οὕτως ἐγγύτερον τοῦ εἰδέναι. ὅλον εἰ τὸ Δ εἴη τετραγωνίζεσθαι, τὸ δ' ἐφ' ᾧ Ε εὐθύγραμμον, τὸ δ' ἐφ' ᾧ Ζ κύκλος· εἰ τοῦ ΕΖ ἐν μόνον εἴη μέσον, τὸ μετὰ μηνίσκων ἴσον γίνεσθαι εὐθυγράμμῳ τὸν κύκλον, ἐγγὺς ἂν εἴη τοῦ εἰδέναι. ὅταν δέ μήτε
 35 πιστότερον ἢ τὸ ΒΓ τοῦ ΑΓ μήτ' ὀλίγα τὰ μέσα, οὐ λέγω ἀπαγωγὴν· οἷδ' ὅταν ἄμεσον ἢ τὸ ΒΓ· ἐπιστήμη γὰρ τὸ τοιοῦτον.

XXVI. Ἐνστασις δ' ἐστὶ πρότασις προτάσει ἐναντία. διαφέρει δὲ τῆς προτάσεως ὅτι τὴν μὲν ἐνστασιν ἐνδέχεται εἶναι ἐπὶ μέρους, τὴν δὲ πρό-
 69 b τασιν ἢ ὅλως οὐκ ἐνδέχεται ἢ οὐκ ἐν τοῖς καθόλου συλλογισμοῖς.

Φέρεται δὲ ἡ ἐνστασις διχῶς καὶ διὰ δύο σχημάτων, διχῶς μὲν ὅτι ἡ καθόλου ἢ ἐν μέρει πᾶσα ἐνστασις, ἐκ δύο δὲ σχημάτων ὅτι ἀντικείμενα φέρονται τῇ προτάσει, τὰ δ' ἀντικείμενα ἐν τῷ

¹ προσειληφέναι, τὴν ΑΓ] προσειληφέναι τῇ ΑΓ τὴν ΒΓ, Pacius, Tricot.

* According to the theory of Hippocrates of Chios: cf. *Soph. Elench.* 171 b 15.

intermediate terms between the last and the middle ; for in all such cases the effect is to bring us nearer to knowledge. (1) *E.g.*, let A stand for ' that which can be taught,' B for ' knowledge ' and C for ' morality.' Then that knowledge can be taught is evident ; but whether virtue is knowledge is not clear. Then if BC is not less probable or is more probable than AC, we have reduction ; for we are nearer to knowledge for having introduced an additional term, whereas before we had no knowledge that AC is true.

(2) Or again we have reduction if there are not many intermediate terms between B and C ; for in this case too we are brought nearer to knowledge. *E.g.*, suppose that D is ' to square,' E ' rectilinear figure ' and F ' circle.' Assuming that between E and F there is only one intermediate term—that the circle becomes equal to a rectilinear figure by means of lunules ^a—we should approximate to knowledge. When, however, BC is not more probable than AC, or there are several intermediate terms, I do not use the expression ' reduction ' ; nor when the proposition BC is immediate ; for such a statement implies knowledge.^b

XXVI. An objection is a premiss which is contrary to another premiss. It differs from the premiss in that it may be particular, whereas the premiss either cannot be particular at all, or at least not in universal syllogisms. Objection defined.

An objection can be brought in two ways and in two figures : in two ways because every objection is either universal or particular, and by two figures because objections are brought in opposition to the Objections may be particular or universal ; they can be raised in .

^b And therefore reduction, which is a method of approximation to knowledge, is out of place.

69 b

- 5 πρώτῳ καὶ τῷ τρίτῳ σχήματι περαίνονται μόνοις.
 ὅταν γὰρ ἀξιῶσθαι παντὶ ὑπάρχειν, ἐπιστάμεθα ὅτι
 οὐδενὶ ἢ ὅτι τινὶ οὐχ ὑπάρχει· τούτων δὲ τὸ μὲν
 μηδενὶ ἐκ τοῦ πρώτου σχήματος, τὸ δὲ τινὶ μὴ ἐκ
 τοῦ ἐσχάτου. οἷον ἔστω τὸ Α μίαν εἶναι ἐπι-
 στήμην, ἐφ' ᾧ τὸ Β ἐναντία· προτείναντος δὴ μίαν
 10 εἶναι τῶν ἐναντίων ἐπιστήμην ἢ ὅτι ὅλως οὐχ ἢ
 αὐτῇ τῶν ἀντικειμένων ἐνίσταται, τὰ δ' ἐναντία
 ἀντικείμενα, ὥστε γίγνεται τὸ πρῶτον σχῆμα, ἢ ὅτι
 τοῦ γνωστοῦ καὶ ἀγνωστοῦ οὐ μία· τοῦτο δὲ τὸ
 τρίτον· κατὰ γὰρ τοῦ Γ, τοῦ γνωστοῦ καὶ ἀγνώ-
 στοῦ, τὸ μὲν ἐναντία εἶναι ἀληθές, τὸ δὲ μίαν αὐτῶν
 15 ἐπιστήμην εἶναι ψεῦδος.

Πάλιν ἐπὶ τῆς στερητικῆς προτάσεως ὡσαύτως.
 ἀξιούντος γὰρ μὴ εἶναι μίαν τῶν ἐναντίων ἢ ὅτι
 πάντων τῶν ἀντικειμένων ἢ ὅτι τινῶν ἐναντίων ἢ
 αὐτῇ λέγομεν, οἷον ὑγιεινοῦ καὶ νοσώδους· τὸ μὲν
 οὖν πάντων ἐκ τοῦ πρώτου, τὸ δὲ τινῶν ἐκ τοῦ
 τρίτου σχήματος.

- 20 Ἀπλῶς γὰρ ἐν πᾶσι καθόλου μὲν ἐπιστάμενον
 ἀνάγκη πρὸς τὸ καθόλου τῶν προτεινομένων τὴν
 ἀντίφασιν εἰπεῖν· οἷον εἰ μὴ τὴν αὐτὴν ἀξιοῖ τῶν
 ἐναντίων, πάντων εἰπόντα τῶν ἀντικειμένων μίαν
 (οὕτω δ' ἀνάγκη τὸ πρῶτον εἶναι σχῆμα, μέσον γὰρ
 γίγνεται τὸ καθόλου πρὸς τὸ ἐξ ἀρχῆς)· ἐν μέρει
 25 δέ, πρὸς ὃ ἐστὶ καθόλου καθ' οὗ λέγεται ἢ πρό-

* Because the second figure gives only negative conclusions; 28 a 7.

premiss, and opposites can be proved only in the first and third figures.^a For when our opponent claims that the predicate applies to all of the subject, we object that it applies to none, or does not apply to some. The former objection is brought by the first figure, and the latter by the last. *E.g.*, let A stand for 'to be one science,' and B for 'contraries.' Then when it is premised that there is one science of contraries, the objection is either (1) that the same science does not treat of opposites, and that contraries are opposites—so that the first figure results ; or (2) that there is not one science of the knowable and unknowable. This is the third figure ; for to state of C, viz. the knowable and unknowable, that they are contraries, is true ; but to state that there is one science of them is false.

the first and third figures, Objection to an affirmative premiss,

So again in the case of a negative premiss. When it is claimed that there is not one science of contraries, we reply either that all opposites or that some contraries, *e.g.*, the healthy and the diseased, are studied by a single science. The former objection is raised by the first figure, and the latter by the third.

and to a negative premiss.

The general rule is that in all cases one who is raising a universal objection must state his contradiction with reference to the universal including the terms premised ; *e.g.*, if it is claimed that the same science does not treat of contraries, he must maintain that there is one science of all opposites. In this way the first figure must result ; for the universal which includes the original term becomes the middle. But when the objection is particular, the contradiction must be stated with reference to the term which is included by the subject of the premiss as a universal ;

Rules for raising universal

and particular objections.

69 b

τασις, οἷον γνωστοῦ καὶ ἀγνωστοῦ μὴ τὴν αὐτὴν· τὰ γὰρ ἐναντία καθόλου πρὸς ταῦτα (καὶ γίνεται τὸ τρίτον σχῆμα· μέσον γὰρ τὸ ἐν μέρει λαμβανόμενον, οἷον τὸ γνωστὸν καὶ τὸ ἀγνωστον). ἐξ ὧν γὰρ ἔστι συλλογίσασθαι τοῦναντίον, ἐκ τούτων καὶ
 80 τὰς ἐνστάσεις ἐπιχειροῦμεν λέγειν. διὸ καὶ ἐκ μόνων τούτων τῶν σχημάτων φέρομεν ἐν μόνοις γὰρ οἱ ἀντικείμενοι συλλογισμοί (διὰ γὰρ τοῦ μέσου οὐκ ἦν καταφατικῶς).

Ἔτι δὲ καὶ λόγου δέοιτο πλείονος ἢ διὰ τοῦ μέσου σχήματος, οἷον εἰ μὴ δοίη τὸ Α τῷ Β ὑπάρχειν διὰ τὸ μὴ ἀκολουθεῖν αὐτῷ τὸ Γ. τοῦτο γὰρ
 85 δι' ἄλλων προτάσεων δῆλον· οὐ δαὶ δὲ εἰς ἄλλα ἐκτρέπεσθαι τὴν ἐνστασιν, ἀλλ' εὐθὺς φανεράν ἔχειν τὴν ἐτέραν πρότασιν. διὸ καὶ τὸ σημεῖον ἐκ μόνου τούτου τοῦ σχήματος οὐκ ἔστιν.

Ἐπισκεπτέον δὲ καὶ περὶ τῶν ἄλλων ἐνστάσεων, οἷον περὶ τῶν ἐκ τοῦ ἐναντίου καὶ τοῦ ὁμοίου καὶ
 90 α τοῦ κατὰ δόξαν, καὶ εἰ τὴν ἐν μέρει ἐκ τοῦ πρώτου ἢ τὴν στερητικὴν ἐκ τοῦ μέσου δυνατὸν λαβεῖν.

XXVII. Εἰκὸς δὲ καὶ σημεῖον οὐ ταῦτόν ἐστιν, ἀλλὰ τὸ μὲν εἰκὸς ἐστὶ πρότασις ἐνδοξος· ὁ γὰρ ὡς
 95 ἐπὶ τὸ πολὺ ἴσασιν οὕτω γιγνόμενον ἢ μὴ γιγνόμενον ἢ ὄν ἢ μὴ ὄν, τοῦτ' ἐστὶν εἰκὸς, οἷον τὸ μισεῖν τοὺς φθονοῦντας ἢ τὸ φιλεῖν τοὺς ἐρωμένους· σημεῖον δὲ βούλεται εἶναι πρότασις ἀποδεικτικὴ

* 28 a 7.

† The argument is: $AaC - BeC, \therefore BeA$. But this depends upon the validity of the major AaC , which itself needs proof.

‡ Cf. 70 a 34 ff. The remark is irrelevant here.

§ Cf. *Rhet.* II. xxv.

e.g., it must be stated that the science of the knowable and the unknowable is not the same, for these are included in contraries as a universal; and the third figure results, for the term which is assumed as particular, viz. the knowable and unknowable, becomes the middle. It is from the premisses from which it is possible to argue the contrary that we try to infer objections. Hence it is only by these figures that we try to raise them, because in these only are opposite syllogisms possible, since (as we saw ^a) an affirmative result cannot be obtained in the middle figure.

Moreover, an objection by the middle figure would require more argument; *e.g.*, supposing that it were not granted that A applies to B on the ground that C is not a consequent of B. This can be clearly shown by means of further premisses ^b; but an objection ought not to pass on to other considerations, but to display its further premiss immediately. Hence also this is the only figure from which proof by signs ^c is impossible.

Difficulty of objection by the second figure.

We must also consider the other forms of objection, viz. objections from contrary or similar cases, or from received opinion ^d; and whether particular objections can be drawn from the first or negative objections from the second figure.^e

XXVII. A probability is not the same as a sign. The former is a generally accepted premiss; for that which people know to happen or not to happen, or to be or not to be, usually in a particular way, is a probability: *e.g.*, that the envious are malevolent or that those who are loved are affectionate. A sign, however, means a demonstrative premiss which is neces-

A probability distinguished from a sign.

* This question is, I believe, never discussed.

70 a

ἀναγκαῖα ἢ ἐνδοξος· οὐ γὰρ ὅντος ἔστιν ἢ οὐ γινο-
μένου πρότερον ἢ ὕστερον γέγονε τὸ πρᾶγμα, τοῦτο

10 σημεῖόν ἐστι τοῦ γεγονέναι ἢ εἶναι.

Ἐιθύμημα μὲν οὖν ἐστὶ συλλογισμὸς ἐξ εἰκότων
ἢ σημείων, λαμβάνεται δὲ τὸ σημεῖον τριχῶς,
ὅσαχῶς καὶ τὸ μέσον ἐν τοῖς σχήμασιν· ἢ γὰρ ὡς
ἐν τῷ πρώτῳ ἢ ὡς ἐν τῷ μέσῳ ἢ ὡς ἐν τῷ τρίτῳ,
οἷον τὸ μὲν δεῖξαι κύουσιν διὰ τὸ γάλα ἔχειν ἐκ
15 τοῦ πρώτου σχήματος· μέσον γὰρ τὸ γάλα ἔχειν.
ἐφ' ᾧ τὸ Α κύειν, τὸ Β γάλα ἔχειν, γινῆ ἐφ' ᾧ Γ.
τὸ δ' ὅτι οἱ σοφοὶ σπουδαῖοι, Πιττακὸς γὰρ σπου-
δαῖος, διὰ τοῦ ἐσχάτου. ἐφ' ᾧ Α τὸ σπουδαῖον,
ἐφ' ᾧ Β οἱ σοφοί, ἐφ' ᾧ Γ Πιττακός. ἀληθές δὴ
καὶ τὸ Α καὶ τὸ Β τοῦ Γ κατηγορῆσαι, πλὴν τὸ
20 μὲν οὐ λέγουσι διὰ τὸ εἰδέναι, τὸ δὲ λαμβάνουσιν.
τὸ δὲ κύειν ὅτι ὠχρὰ διὰ τοῦ μέσου σχήματος
βούλεται εἶναι· ἐπεὶ γὰρ ἔπεται ταῖς κυούσαις τὸ
ὠχρόν, ἀκολουθεῖ δὲ καὶ ταύτῃ, δεδειχθαι οἷονται
ὅτι κύει. τὸ ὠχρόν ἐφ' οὐ τὸ Α, τὸ κύειν ἐφ' οὐ
Β, γινῆ ἐφ' οὐ Γ.

Ἐὰν μὲν οὖν ἢ μία λεχθῇ πρότασις, σημεῖον
25 γίνεταί μονον, εἰάν δὲ καὶ ἢ ἑτέρα προσληφθῇ,
συλλογισμὸς, οἷον ὅτι Πιττακὸς ἐλευθέριος, οἱ γὰρ
φιλότιμοι ἐλευθέριοι, Πιττακὸς δὲ φιλότιμος· ἢ
πάλιν ὅτι οἱ σοφοὶ ἀγαθοί, Πιττακὸς γὰρ ἀγαθός,
ἀλλὰ καὶ σοφός.

Οὕτω μὲν οὖν γίγνονται συλλογισμοί, πλὴν ὁ μὲν
30 διὰ τοῦ πρώτου σχήματος ἄλυτος, ἂν ἀληθὴς ἢ
(καθόλου γὰρ ἔστιν), ὁ δὲ διὰ τοῦ ἐσχάτου λίσσιμος,

* If referable to one phenomenon only, a sign has objective necessity; if to more than one, its value is a matter of opinion.

sary or generally accepted.^a That which coexists with something else, or before or after whose happening something else has happened, is a sign of that something's having happened or being.

An enthymeme is a syllogism from probabilities or signs ; and a sign can be taken in three ways—in just as many ways as there are of taking the middle term in the several figures : either as in the first figure or as in the second or as in the third. *E.g.*, the proof that a woman is pregnant because she has milk is by the first figure ; for the middle term is ' having milk.' A stands for ' pregnant,' B for ' having milk,' and C for ' woman.' The proof that the wise are good because Pittacus was good is by the third figure. A stands for ' good,' B for ' the wise,' and C for Pittacus. Then it is true to predicate both A and B of C ; only we do not state the latter, because we know it, whereas we formally assume the former. The proof that a woman is pregnant because she is sallow is intended to be by the middle figure ; for since sallowness is a characteristic of women in pregnancy, and is associated with this particular woman, they suppose that she is proved to be pregnant. A stands for ' sallowness,' B for ' being pregnant ' and C for ' woman.'

If only one premiss is stated, we get only a sign ; but if the other premiss is assumed as well, we get a syllogism,^b *e.g.*, that Pittacus is high-minded, because those who love honour are high-minded, and Pittacus loves honour ; or again that the wise are good, because Pittacus is good and also wise.

In this way syllogisms can be effected ; but whereas a syllogism in the first figure cannot be refuted if it is true, since it is universal, a syllogism in the last

Enthymeme. Use of signs in the three figures.

A sign may be regarded as a syllogism with one premiss suppressed.

Refutability of arguments from signs in the several figures.

^b Strictly an enthymeme.

70^a

καὶ ἀληθές ἢ τὸ συμπέρασμα, διὰ τὸ μὴ εἶναι καθόλου μηδὲ πρὸς τὸ πρᾶγμα τὸν συλλογισμόν· οὐ γὰρ εἰ Πιττακὸς σπουδαῖος, διὰ τοῦτο καὶ τοὺς ἄλλους ἀνάγκη σοφοὺς. ὁ δὲ διὰ τοῦ μέσου

σχήματος αἰεὶ καὶ πάντως λύσιμος· οὐδέποτε γὰρ γίγνεται συλλογισμὸς οὕτως ἐχόντων τῶν ὅρων· οὐ γὰρ εἰ ἡ κύουσα ὠχρά, ὠχρά δὲ καὶ ἡδε, κύειν ἀνάγκη ταύτην. ἀληθεῖς μὲν οὖν ἐν ἅπασιν ὑπάρξει τοῖς σημείοις,¹ διαφορὰς δ' ἔχουσι τὰς εἰρημέναις.

70^b

Ἡ δὲ οὕτω διαιρετέον τὸ σημεῖον, τούτων δὲ τὸ μέσον τεκμήριον ληπτέον (τὸ γὰρ τεκμήριον τὸ εἰδέναι ποιοῦν φασὶν εἶναι, τοιοῦτο δὲ μάλιστα τὸ μέσον), ἢ τὰ μὲν ἐκ τῶν ἁκρων σημεία λεκτέον· τὸ δ' ἐκ τοῦ μέσου τεκμήριον· ἐνδοξότατον γὰρ καὶ μάλιστα ἀληθές τὸ διὰ τοῦ πρώτου σχήματος.

Τὸ δὲ φυσιογνωμονεῖν δυνατόν ἐστιν εἰ τις δίδωσιν ἅμα μεταβάλλειν τὸ σῶμα καὶ τὴν ψυχὴν ὅσα φυσικά ἐστι παθήματα (μαθὼν γὰρ ἴσως μουσικὴν μεταβέβληκέ τι τὴν ψυχὴν, ἀλλ' οὐ τῶν φύσει ἡμῶν ἐστὶ τοῦτο τὸ πάθος, ἀλλ' ὅλον ὄργαι καὶ ἐπιθυμίαι τῶν φύσει κυτήσεων). εἰ δὲ τοῦτό τε δοθείη καὶ ἐν ἐνὸς σημείον εἶναι, καὶ δυναίμεθα λαμβάνειν τὸ

¹ σημείοις] σχήμασιν C¹, Pacius (?), Tricot.

* If the signs of an enthymeme in the first figure are true, the conclusion is inevitable. Aristotle does not mean that the conclusion is universal, but that the universality of the major premiss implies the validity of the minor and conclusion. The example (call) those who love honour, etc.) quoted for the third figure contains no universal premiss or sign, and fails to establish a universal conclusion.

^b i.e. when both premisses are affirmative.

^c Signs may be classified as irrefutable (1st figure) and

figure can be refuted even if the conclusion is true, because the syllogism is neither universal nor relevant to our purpose.^a For if Pittacus is good, it is not necessary for this reason that all other wise men are good. A syllogism in the middle figure is always and in every way refutable, since we never get a syllogism with the terms in this relation ^b; for it does not necessarily follow, if a pregnant woman is fallow, and this woman is fallow, that she is pregnant. Thus truth can be found in all signs, but they differ in the ways which have been described.

We must either classify signs in this way, and regard their middle term as an index ^c (for the name 'index' is given to that which causes us to know, and the middle term is especially of this nature), or describe the arguments drawn from the extremes ^d as 'signs,' and that which is drawn from the middle as an 'index.' For the conclusion which is reached through the first figure is most generally accepted and most true.

Alternative uses of the names 'sign' and 'index.'

It is possible to judge men's character from their physical appearance, if one grants that body and soul change together in all natural affections. (No doubt after a man has learned music his soul has undergone a certain change, but this affection is not one which comes to us naturally; I mean such affections as fits of anger or desires among natural excitements.) Supposing, then, this is granted, and also that there is one sign of one affection, and that we can recognize

Use of signs in estimating character by appearance.

refutable (2nd and 3rd figures), and the name 'index' may be attached to their middle terms, either in all figures or (more probably) only in the first, where the middle is distinctively middle.

^d Alternatively the name 'sign' may be restricted to the 2nd and 3rd figures, and may be replaced by 'index' in the first.

70 b

ἴδιον ἐκάστου γένους πάθος καὶ σημεῖον, δυνησόμεθα φυσιογνωμονεῖν. εἰ γὰρ ἐστὶν ἴδια ταῖς γένει
 15 ὑπάρχον ἀτόμῳ πάθος, οἷον τοῖς λέουσιν ἀνδρεία,
 ἀνάγκη καὶ σημεῖον εἶναι τι συμπίσχειν γὰρ
 ἀλλήλοις ὑπόκειται. καὶ ἔστω τοῦτο τὸ μέγαλα τὰ
 ἀκρωτήρια ἔχειν· ὁ καὶ ἄλλοις ὑπάρχειν γένεσι μὴ
 ὅλοις ἐνδέχεται. τὸ γὰρ σημεῖον οὕτως ἴδιόν ἐστιν,
 ὅτι ὅλου γένους ἴδιόν ἐστι τὸ πάθος, καὶ οὐ μόνου
 20 ἴδιον, ὥσπερ εἰώθαμεν λέγειν. ὑπάρξει δὴ καὶ ἐν
 ἄλλῳ γένει ταυτό, καὶ ἔσται ἀνδρείος ὁ ἄνθρωπος
 καὶ ἄλλο τι ζῷον. ἔξει ἄρα τὸ σημεῖον· ἐν γὰρ ἐνὸς
 ἦν. εἰ τοίνυν ταῦτ' ἐστί, καὶ δυνησόμεθα τοιαῦτα
 σημεῖα συλλέξαι ἐπὶ τούτων τῶν ζῶων ἢ μόνον ἐν
 25 πάθος ἔχει τι ἴδιον, ἐκάστον δ' ἔχει σημεῖον, ἐπεὶ περ
 ἐν ἔχειν ἀνάγκη, δυνησόμεθα φυσιογνωμονεῖν. εἰ
 δὲ δύο ἔχει ἴδια ὅλον τὸ γένος, οἷον ὁ λέων ἀνδρείον
 καὶ μεταδοτικόν, πῶς γνωσόμεθα πότερον ποτέρου
 σημεῖον τῶν ἴδια ἀκολουθούντων σημείων; ἢ εἰ
 ἄλλῳ μὴ ὅλῳ τινὶ ἁμφω, καὶ ἐν οἷς μὴ ὅλοις ἐκά-
 30 τερον, ὅταν τὸ μὲν ἔχη τὸ δὲ μὴ· εἰ γὰρ ἀνδρείος
 μὲν ἐλευθέριος δὲ μὴ, ἔχει δὲ τῶν δύο τοδί, δῆλον
 ὅτι καὶ ἐπὶ τοῦ λέοντος τοῦτο σημεῖον τῆς ἀνδρείας.

Ἔστι δὴ τὸ φυσιογνωμονεῖν τῷ ἐν τῷ πρώτῳ
 σχήματι τὸ μέσον τῷ μὲν πρώτῳ ἀκρῷ ἀντιστρέ-
 φειν, τοῦ δὲ τρίτου ὑπερτείνειν καὶ μὴ ἀντιστρέ-

¹ τῷ cdm. Waite: τὸ C: τῶν ccl.

the affection and sign proper to each class of creatures, we shall be able to judge character from physical appearance. For if a peculiar affection applies to any individual class, *e.g.*, courage to lions, there must be some corresponding sign of it ; for it has been assumed that body and soul are affected together. Let this be 'having large extremities.' This may apply to other classes, but not as wholes ; for a sign is peculiar in the sense that the affection is peculiar to the class as a whole, and not to it alone, as we are accustomed to use the term. Thus the same affection will be found in another class also, and man or some other animal will be brave. Therefore he will have the sign ; for *ex hypothesi* there is one sign of one affection. If, then, this is so, and we can collate signs of this kind in the case of animals which have only one peculiar affection, and if each affection has a sign, since it necessarily has only one sign, we shall be able to judge their character by their appearance. But if the genus as a whole has two peculiar affections, *e.g.*, if lions have courage and a readiness to share, how shall we decide which sign of those which are peculiarly associated with the genus belongs to which affection ? Probably if both affections are found in some other class not as a whole, that is, when of the classes in which each of them is found certain members possess one but not the other. For if a man is brave but not generous, and exhibits one of the two signs, clearly this will be the sign of courage in the lion as well.

Thus it is possible to judge character from the appearance in the first figure, provided that the middle term is convertible with the first extreme, but is wider in extension than the third term and not

70 b

φειν, οἷον ἀνδρεία τὸ Α, τὰ ἀκρωτήρια μεγάλα
 ἐφ' οὗ Β, τὸ δὲ Γ λίων. ὥ δὴ τὸ Γ τὸ Β παντί,
 ἀλλὰ καὶ ἄλλοις· ὥ δὲ τὸ Β, τὸ Α παντὶ καὶ οὐ
 πλείωσιν, ἀλλ' ἀντιστρέφει· εἰ δὲ μή, οὐκ ἔσται
 ἐν ἐνὸς σημείον.

convertible with it : *e.g.*, if A stands for courage, B for large extremities and C for lion. Then B applies to all of that to which C applies, and also to others, whereas A applies to all that to which B applies, and to no more, but is convertible with B. Otherwise there will not be one sign of one affection.