

THE RELATIONSHIP OF ARISTOTLE'S TWO ANALYTICS

In 1928, Friedrich Solmsen argued that Aristotle's *Posterior Analytics* was largely composed before the *Prior Analytics*.¹ Ross rejected Solmsen's position in 1939, and a rather lengthy series of rebuttals and counter-attacks between the two scholars followed.² Quite recently, Jonathan Barnes³ has revived this issue with arguments in favour of something very close to Solmsen's thesis: that Aristotle first developed a theory of demonstration ('apodeictic') before he had worked out the syllogistic, and that the *Posterior Analytics* was originally conceived against this background. Subsequently, when Aristotle formulated a syllogistic, he is supposed by Barnes to have revised or added to the contents of the *Posterior Analytics* so as to make syllogistic the logic of Aristotelian science. Thus, Barnes says: '... the syllogism is in fact an incidental adjunct to the theory of demonstration: the theory can be formulated without reference, explicit or implicit, to Syllogistic, and it *could* have been discovered by someone who knew nothing whatever about the Syllogism' (pp. 33–4). Barnes proceeds to argue on several grounds that Aristotle did in fact develop the theory of demonstration while *totally* ignorant of the syllogistic: the 'logic of the original Apodeictic' was instead 'the various inference schemata... described in the *Topics*' (p. 52 n. 56). Now, I agree with Barnes that Aristotle developed a theory of demonstrative science before developing the syllogistic theory presented in *Prior Analytics A* 1–22. However, I do not think a case has been made that, as Barnes says, at one time 'Apodeictic lived a virginal life, untouched by the Syllogism' (56). Rather, I think that *Posterior Analytics A* presupposes throughout a different theory of syllogisms from that contained in the *Prior Analytics*. Specifically, Aristotle seems to be working with a syllogistic limited to universal propositions (precisely the *Apodeiktik* which Solmsen claimed to find). This theory is not simply the result of artificially limiting the *Prior Analytics* syllogistic to universal premisses (and conclusions): it is actually inconsistent with the *Prior Analytics* theory on a few points, and it is certainly ignorant of many others. Thus, the *Posterior Analytics* does not contain a syllogistic overlay on a non-syllogistic text: the text is from the beginning dependent on a logically less sophisticated theory than the syllogistic.

My argument for this rests on three claims: (1) the *Posterior Analytics* as we have it does not presuppose the *Prior Analytics* but something decidedly simpler; (2) there are major elements of logical theory in which the *Posterior Analytics* is demonstrably inconsistent with (and inferior to) the *Prior Analytics*; (3) the theory which the *Posterior Analytics* does presuppose is not incidental to the theory of demonstration but in fact absolutely essential to its structure in major points (in particular, the argument that there must be indemonstrable principles, which is one of the central

¹ Friedrich Solmsen, *Die Entwicklung der aristotelischen Logik und Rhetorik* (*Neue philologische Untersuchungen*, ed. W. Jaeger, Heft 4, Berlin, 1928).

² 'The Discovery of the Syllogism', *Philosophical Review* 48 (1939), 251–72. For a full documentation of the Ross–Solmsen dispute, see p. 17 n. 1 of the work cited in the next footnote.

³ 'Proof and the Syllogism' in E. Berti and M. Mignucci, eds., *Aristotle on Science: the 'Posterior Analytics'* (Padua, 1981), pp. 17–59.

claims of the work). I have defended claims (2) and (3) elsewhere.⁴ Here, I wish to argue for (1) by considering all passages in the *Posterior Analytics* which might be taken to presuppose the syllogistic: there is no real alternative to such a point-by-point analysis. Since Ross's arguments on this score are still very influential, I have organized my paper according to the order of discussion of passages in his edition.⁵

Ross's arguments for the dependence of the *Posterior Analytics* on the *Prior* may be grouped under two heads: (1) those concerning actual references from the former work to the latter, and (2) those concerning passages in *Posterior Analytics A* the contents of which presuppose doctrines from the *Prior Analytics*.

He discusses four texts containing actual references: *An. Pr. A* 4, 25b26–31 and *An. Post. A* 3, 73a7–16; 16, 80a7–8; 25, 86b10–12. He passes over other references from which, he says, 'no sure conclusion can be drawn'. His comments are as follows:

1. *An. Pr. A* 4, 25b26–31. In this passage Aristotle says that, since demonstration is a sort of syllogism, we should first discuss the more general notion (i.e., in *An. Pr.*) and later its species (i.e., in *An. Post. A*). The passage in question, of course, says nothing directly about the order in which Aristotle developed any theories: it simply claims that the concept of συλλογισμός is more general than, and hence logically prior to, the concept of ἀπόδειξις. Obviously, the immediate conclusion to draw is that the passage in question was written *after* Aristotle had developed the theory of demonstration as well as the theory of the syllogism. Ross, however, argues that this passage must 'belong to the original structure of the *Prior Analytics*' rather than having been 'added after Aristotle wrote both works'. I have already indicated the inappropriateness I see in referring to the relative dates of the two *Analytics*, but in any event that subject is irrelevant to the question I am pursuing: obviously, if this remark was 'part of the original structure of the *Prior Analytics*', then that work presupposes the fundamental concept of a demonstration as συλλογισμός ἀποδεικτικός of *Posterior Analytics A*. Ross says further that taking the remark as a later addition 'ascribes a rather disingenuous procedure to Aristotle' in that Aristotle is supposed to have 'worked out a theory of demonstration, without having discovered that demonstration is but a species of syllogism; then to have discovered that it is so, and the nature and rules of the genus to which it belongs, and then to have said "let us study the genus first, because we obviously ought to study the genus before the species"' (pp. 9–10). I cannot understand why Ross considers such a course of events unlikely: if it be disingenuous, then so is that of any mathematician who presents a more abstract and general theory before some special case of it when he actually discovered them in reverse order. (In fact, Aristotle many times suggests that the natural course for scientific discovery is from less to more general propositions, just the reverse of the scientific order of presentation; cf. the reference to such a case in proportion theory in *An. Post. A* 5, 74a17–25.) Rather than supporting the claim that the theory of the *Prior Analytics* must have antedated that of the *Posterior*, then, this passage leans slightly towards support for the claim that the theory of demonstration antedated *Prior Analytics A*.

⁴ Claim (2) is defended in 'The Syllogism in *Posterior Analytics* I', *Archiv für Geschichte der Philosophie* (forthcoming 1982); claim (3) is defended in 'The Indemonstrability of Principles in Aristotelian Sciences' (as yet unpublished; presented in abridged form to the American Philosophical Association, Eastern Division, Philadelphia, 1981).

⁵ In the remainder of this paper, I cite the following by author's name: Jonathan Barnes, *Aristotle's Posterior Analytics* (Oxford, 1975); Mario Mignucci, *L'argomentazione dimostrativa in Aristotele: commento agli Analitici Secondi*, 1 (Padua, 1975); John Philoponus, *In Aristotelis Analytica Posteriora* (*Commentaria in Aristotelem Graeca* XIII. 3); W. D. Ross, *Aristotle's Prior and Posterior Analytics* (Oxford, 1949).

2. *An. Post. A 3*, 73a7–16. Ross discusses this as two passages, 73a7–11 and 73a11–16 (both on p. 10). In the first, Aristotle says ‘it has been shown that when one thing is posited, it is never necessary for something else to be...but two theses (*θέσεις*) are the first and least things from which it is possible, if indeed a syllogism is to come about’. (For some reason Ross includes ‘and therefore *a fortiori* for the demonstrative syllogism of science’ in his translation; no words in the Greek text resemble this.) The reference, says Ross, is either to *An. Pr. A 15*, 34a16–21, or *A 23*, 40b30–7. Each of those passages does indeed contain an *assertion* that nothing follows from a single premiss; but in neither place is there any semblance of proof. Ross asserts: ‘if it had not been established already, as it is in the *Prior Analytics*...it would be the merest assumption’. Since no proof is offered of the claim in the *Prior Analytics*, it would be just as appropriate to call it the ‘merest assumption’ in that work also (and so, rather than *δέδεικται* at 73a8, Aristotle was only entitled to *εἴρηται*). At the best, then, this reference is problematic.

In the second part of the passage (73a11–16), Aristotle makes an unmistakable reference (*ὡς δέδεικται ἐν τοῖς περὶ συλλογισμοῦ*) to the discussion in *An. Pr. B 5–7* of ‘proving in a circle and reciprocally’ (*τὸ κύκλῳ καὶ ἐξ ἀλλήλων δείκνυσθαι*). Ross correctly notes that the argument for a major point in the *Posterior Analytics* – the impossibility of a ‘circular’ demonstration of first principles – here appeals to a technical point of the syllogistic. But let us take a closer look. In fact, as Barnes (pp. 108, 111–12) has shown, there is a significant difference between the subject of *An. Post. A 3* and that of *An. Pr. B 5–7*. The argument in the *Posterior Analytics* aims at showing the following: suppose we have a circular demonstration of certain principles, i.e., we demonstrate B from the assumption that A and A from the assumption that B. Although the precise interpretation of this passage is not clear, Aristotle appears to rely on the transitivity of entailment to argue that such a circle amounts to proof that A is true if A is true. In *Prior Analytics B 5–7*, by contrast, Aristotle’s concern is a process of ‘proving one premiss through the conclusion and the other premiss taken in the reverse order of predication’ (57b18–20). Thus, beginning with a syllogism which concludes *Aca*⁶ from *Aba* and *Acb*, a circular and reciprocal proof would aim at (say) proving *Aba* (a premiss of the original syllogism) from *Aca* (the conclusion) and *Abc* (the converse of the remaining premiss). Aristotle shows that such an operation can be carried out in all ways with a syllogism in *Barbara* on the condition that all the terms are coextensive (57b35–58a20), and he refers to this result in *An. Post. A 3* (73a6–7, 11–14). However, the *τὸ κύκλῳ καὶ ἐξ ἀλλήλων δείκνυσθαι* procedure differs from the case described in 72b37–73a6 in two fundamental ways. First, since a syllogism has two premisses, we should somehow have to suppose that in 72b37 ff. ‘A’ denotes the premisses of a syllogism and ‘B’ the conclusion which follows, in which case ‘if B is, A is necessary’ will refer to the premisses of a syllogism following from their conclusion. Second, even could we overcome the asymmetry between what is assumed (two premisses) and what is proved (a single proposition) here, the *κύκλῳ καὶ ἐξ ἀλλήλων* proof uses a premiss not found in the syllogism on which it is based (the *converse* of one of its premisses). Thus, Aristotle’s reference here is not obviously germane to his point. In fact, the entire section 73a6–20 contributes nothing of major importance to the basic argument against circular demonstration: the argument as presented rests only on a general rule of transitivity for demonstrations. It is, of course, possible that this argument did not

⁶ I use ‘*Aab*’, ‘*Eab*’, ‘*Iab*’, ‘*Oab*’, for ‘All *a* is *b*’, ‘No *a* is *b*’, ‘Some *a* is *b*’, ‘Some *a* is not *b*’.

occur to Aristotle until after he had investigated the subject in *An. Pr. B* 5–7, but it is equally possible (I should say more likely) that 73a6–20 is a later attempt – and not a very successful one – to draw a sort of corollary from the main argument in the light of further technical discoveries. Whatever may be the case, certainly this passage does not entail that Aristotle's theory of demonstration could only have been developed after the syllogistic had been completed; to some extent, the fact that the two parts of the argument are ill fitted together suggests that the theory was first elaborated *before* the investigations recorded in *An. Pr. B* 5–7 were conducted.

3. *An. Post. A* 6, 80a7–8: 'For there was not a syllogism of belonging in another [ἄλλω: "the other"?] figure...' Ross translates τοῦ ὑπάρχειν συλλογισμός as 'syllogism of universal attribution', supplying 'universal' on the grounds that 'ὑπάρχειν stands for καθόλου ὑπάρχειν' (p. 560). Of course, it is true that *universal* affirmatives alone are in question here, and in fact there are other passages in *An. Post. A* in which ὑπάρχειν and μὴ ὑπάρχειν must be understood as equivalent to 'belong to all' and 'belong to no' respectively. I shall have more to say about this fact below. Here, note that it is not just the first *figure* to which universal affirmative conclusions are limited but in fact one *mood* (*Barbara*) of that figure. If Aristotle had discovered any number, however small, of correct syllogistic moods which included *Barbara*, he could have made the claim in question here. Thus, if Aristotle had (let us say) discovered only the syllogistic moods with universal conclusions, he could still by inspection have come to this conclusion. Since, in fact, the only proof one can find of this claim in *Prior Analytics A* is simply the determination of the moods (and the rejection of non-syllogizing pairs) in cc. 4–6, Aristotle could have offered a similar proof on the basis of any more primitive system of syllogisms, whatever method he may have used to discover them.

4. *An. Post. A* 25, 86b10–12: it 'has been proved' that no conclusion follows when both premisses are negative. First of all, the remarks above also apply here: since no correct mood has two negative premisses, no collection of correct moods (however established) contains a mood with two negative premisses. Thus, *any* theory of syllogism which does not include incorrect moods will serve as evidence for this claim. (I will have more to say about this passage, and its context, below).

In addition to these explicit references, there are many other passages Ross discusses which presuppose doctrines presented in the *Prior Analytics*. Comments on his conclusions follow.

5. Ross notes that the term συλλογισμός is used without explanation in *An. Post. A* 2, 71b17–18 (other passages could also be cited) and says 'we must conclude that the meaning of the term was well known, and well known because it has been explained in the *Prior Analytics*' (p. 12). No such inference follows. The definition in *An. Pr. A* 1 (24b18–20) is virtually identical with that in *Topics A* 1 (100a25–7), a work Ross himself holds to be older than the *Analytics* (pp. 6–7); and, in any event, this definition is so general as to encompass perhaps any valid argument whatever.

6. Ross notes a number of references to the 'middle term' of a demonstration or of a syllogism (list on p. 12). There are also occasional references to τὸ πρῶτον and τὸ τρίτον (75a36, 77a12, 19) and to τὸ μείζον (80b20). To Ross's citations we might add τὸ ἔσχατον at 71a23, although the intent is uncertain. This terminology presupposes the concept of a syllogism as constructed from two premisses in three terms and the notion of major (first), minor (third or last) and middle term as defined in that concept. This is quite explicit in *An. Post. A* 19, 18b10 ('every syllogism is through three terms...'). An allusion in *A* 25 might be seen as making a similar

presumption (86b7–8: 'for both are through three terms and two premisses...'), but the dependence here is less clear-cut. What these passages show is that the three-term syllogism and the nomenclature appropriate to it are presupposed; of course, this is *not* to say that the entire syllogistic of the *Prior Analytics* is.

7. In various passages, Aristotle appears to refer without explanation to the doctrine of the three syllogistic figures. The most explicit and detailed is c. 14, the thesis of which is that the first figure is 'most scientific'. There are references to τὸ πρῶτον σχῆμα in cc. 3, 73a13–14; 15, 79b15–17; 21, 82b30. The second figure (usually called τὸ μέσον σχῆμα) is mentioned in c. 13, 78b23–5; c. 14, 79a25–6; c. 15, 79b15–20; c. 16, *passim*; c. 17, 81a5–34 *passim*; c. 21, 82b30 (but see below on this). The third figure is clearly referred to once (c. 14, 79a27) as τὸ ἔσχατον, and general references to figures (σχήματα) are found in c. 3, 73a15–16 ('the other figures': cf. above, no. 2); c. 16, 80a7 ('the other figure' or 'another figure': see below); and c. 29, 87b16 ('the other figures'). Now, in many of these cases, appeals to the system of syllogistic figures are essential to Aristotle's point. This is true of all of c. 14, the point of which (that the first figure is 'most scientific') cannot even be stated without the system of figures. However, the other references are to varying degrees less thoroughly integral to Aristotle's argument. The allusions in c. 3 have been shown to fit rather badly with the main point. If we look closely at the other cases, we shall find that, except for c. 14, all that is genuinely presupposed is the universal syllogisms of the first two figures (*Barbara*, *Celarent*, *Camestres*, *Cesare*). Furthermore, we again find no use at all of the theory of 'perfecting' syllogisms by way of 'reduction' to first-figure syllogisms.⁷

(a) C. 13, 78b23–5: 'But the syllogism of such a cause comes about in the middle figure.' The subject of the chapter is the difference between knowing the 'that' (τὸ ὅτι) and the 'why' (τὸ διότι). 78b13–31 discuss cases in which 'the middle is placed outside'; from the example (which involves a syllogism in *Camestres*) and the use of the phrase 'the middle is placed outside the extremes' in the definitions of the second and third figures in *An. Pr. A* 5 (26b39) and 6 (28a14–15), most commentators have concluded that this section is meant to cover second-figure cases (Ross, p. 553; citations in Mignucci, p. 304), third-figure cases being ignored since particular conclusions are not in question in *Posterior Analytics A*. However, as Mignucci (p. 306) points out, Aristotle's claim in 78b13–15 then becomes that no second-figure syllogism gives to τὸ διότι, a claim which is not only false on Aristotle's principles but also something Aristotle does not believe (see Barnes, p. 151; Mignucci, pp. 306–7). Philoponus (174, 4–7), following Alexander, cites the interpretation offered by Ross but rejects it in favour of another: that τὸ μέσον ἔξω τίθεται means 'the middle term stands further off' (πλέον ἀποστήσας: 174. 20), i.e., is a remote and not a proximate cause. On this interpretation the difficulty with the explanation 'a wall does not breathe because it is not an animal' is that a more proximate cause (e.g., not having

⁷ In an unpublished manuscript, John Corcoran has shown that the process of 'perfecting' (τελειοῦσθαι) or 'completing' (περαίνεισθαι) a syllogism is totally distinct from the 'reduction' (ἀνάγειν, ἀναγωγή) of one syllogism to another. On Corcoran's view, which I believe is correct, perfecting a syllogism is constructing a deduction of its conclusion from its premisses. Reduction, by contrast, is a process for transforming one argument into another such that the latter argument is valid only if the former is also. Corcoran notes that Aristotle reserves the term 'reduction' for *direct* reductions (i.e. those not *per impossibile*) and that the phrase ἀναγωγή ἐς τὸ ἀδύνατον does not actually occur in the *Prior Analytics* (Aristotle usually says 'proof through the impossible' or 'abduction' (ἀπαγωγή) to the impossible'). See Corcoran's 'A Mathematical Model of Aristotle's Syllogistic', *Archiv für Geschichte der Philosophie* 55 (1973), 191–219, for his account of the process of perfecting syllogisms.

lungs, as Philoponus suggests (174. 30–2)) could be given. Mignucci generally follows this interpretation, as the ancient and medieval commentators have. We might further observe that if 78b13–14 were intended to specify the second and third figures then (as Philoponus notes, 174. 14–17) the reference to the second figure at 78b23 is otiose. Finally, to assume here (and elsewhere) that Aristotle does not mention the third figure because it always has a particular conclusion whereas demonstrations must always be universal is to supply a reason which Aristotle never actually gives. Now, when we turn to the explicit reference to the *συλλογισμὸς ἐν τῷ μέσῳ σχήματι* in lines 23 to 28, we find that these comments are really external to Aristotle's argument. All Aristotle does in these lines is to show that the example about the wall yields a second-figure syllogism (in *Camestres*). Strictly speaking, we could excise these remarks without impairing the argument at all. I do not wish to say that these remarks are indeed a later note; however, all that 'forms an integral part of Aristotle's treatment of the question under discussion', in Ross's words (p. 12), is the *concrete* syllogism about this wall, which does happen to be in *Camestres*. At most, this passage seems to presuppose familiarity with the single mood *Camestres*.

It should be observed here in passing that we can formulate a close analogue to this example in the first figure: 'Why doesn't a wall breathe? because it is inanimate.' The implied syllogism will then have as premisses either 'No inanimate thing breathes' and 'Every wall is inanimate' (*Celarent*) or 'Nothing that breathes is inanimate' and 'Every wall is inanimate' (*Cesare*). It seems that something like Aristotle's objection to his own case in 78b16–18 could be made here: if being inanimate causes *not* breathing, then *not* being inanimate should cause breathing. Thus, again, there is no special connection between the second figure and Aristotle's position, and accordingly we should not take τὸ μέσον ἔξω τίθεται as a conclusive reference to *An. Pr. A* 5–6 or even to the general doctrine of figures.

(b) Chapter 14 does of course necessarily presuppose the doctrine of the three figures. It also requires some sort of list of moods in each figure, since it mentions the fact that second-figure conclusions are always negative and third-figure conclusions (though sometimes affirmative) always particular (79a25–8). These facts are stated in *An. Pr. A* 5 (28a7–9) and 6 (29a16–18); in each case, the proof is simply the establishment of the correct moods of the figure in question which precedes. Consequently, had Aristotle discovered the correct moods – or, given the negative nature of the claims, any subsystem of them – without the reductions of *An. Pr. A*, he could still have made these assertions. There is, in fact, a reason to suppose that this chapter was written *before* *An. Pr. A* 4–6. In the presentation of the syllogistic, all correct second- and third-figure moods (which are called 'imperfect', ἀτελής) are shown to be correct by 'being perfected' (τελειοῦσθαι) through first-figure moods. In his Preface, in defending the dependence of *An. Post. A* on *An. Pr.*, Ross claims that this doctrine is referred to in *An. Post. A*: 'it is assumed without discussion that arguments in the second and third figures are strictly speaking validated only by reduction to the first figure' (p. 13; perhaps he was misled by Philoponus, 185. 9–26). But Aristotle actually says, 'And furthermore, it has no need of them, but they are packed full and increase (καταπυκνοῦνται καὶ αὐξέται) through it, until they come to the immediates' (79a29–31). This is plainly a reference to a process elsewhere called 'packing' (πυκνοῦσθαι: c. 23, 84b35) or 'inserting a middle' (μέσον ἐμβάλλεσθαι: c. 23, 85a2–3; c. 25, 86b17 ff.) which is, in effect, the proving of the premisses of a syllogism (which of course requires the discovery of a new middle term to link the terms of each premiss: see Mignucci, pp. 332–3; Barnes, pp. 155–6). Ross in fact gives

something like this interpretation of the passage in his commentary (p. 556), where he is quite silent about reduction to the first figure. Aristotle's remarks are extremely sketchy, but using the material concerning ἄμεσοι προτάσεις in *An. Post. A* 19–21 we can make a fair guess at its meaning:⁸ such a process of 'packing', if continued, must eventually introduce universal affirmative premisses, which of course can only be proved in *Barbara* of the first figure. It is significant that *all* Aristotle's remarks about the first figure here actually concern this one mood: the other moods in that figure, just like all non-first-figure moods, are either negative or particular, and any type of proposition except a universal affirmative can be proved either by premisses in the first figure or by premisses in some other. Ross has again overstated his conclusions: the contents of *An. Pr. A* are by no means presupposed here.

(c) Chapter 15 is an exceptionally obscure text.⁹ Ross claims that 79b16–20 relies on two facts of some generality about the syllogistic: that in first-figure syllogisms the minor premiss is always affirmative, and that in second-figure syllogisms one premiss must be affirmative (p. 13). Yet, as Ross himself recognizes in his commentary on this passage (pp. 557–8), only moods *Celarent*, *Cesare*, and *Camestres* are in question. The text actually reads:

If A is the first, B will be in some whole (for the premiss towards it must be affirmative) but if in the middle [figure], whichever it happens to be (for a syllogism comes about with the negative taken towards either one; but it is not possible with both negative).

(79b16–20)

All Aristotle really presumes here is that we can get an *E* conclusion in the first figure only with an *E* major and an *A* minor premiss (*AE* is non-syllogizing), while any combination of *E* and *A* (i.e., *Camestres* or *Cesare*) gives an *E* conclusion in the second figure. Once again, Aristotle's text presupposes a much weaker claim than Ross says. Here, simply knowing the moods *Celarent*, *Camestres*, and *Cesare* and that *AE* in the first figure and *EE* in either figure are non-syllogizing would be sufficient.

(d) Chapters 16 and 17 make a number of references to the first and second figures; c. 16, 80a27–b16, is especially detailed. The subject of these chapters is 'ignorance according to disposition' (ἄγνοια κατὰ διάθεσιν), which Aristotle interprets as 'error coming about through syllogism' (ἡ διὰ συλλογισμοῦ γινομένη ἀπάτη, 79b24). The doctrine as developed is largely a theory of the possible combinations of truth-values of two premisses syllogizing to a conclusion which is in fact false. Aristotle considers only universal conclusions, and so only the moods *Barbara*, *Celarent*, *Camestres*, and *Cesare* are in question. There are a number of difficulties of interpretation in these chapters (to some of which I return below), but there is some evidence here that Aristotle knows the particular moods of the second figure. In 80a27–b16, he discusses the truth values of second-figure premisses concluding to a universal negative which is false. He notes that it is impossible in each case for both premisses to be 'wholly false' (i.e., for their contraries to be true), since this in effect simply gives us true premisses for another second-figure syllogism with the same conclusion. However, he says, 'nothing prevents each of them being false about some' (80a33–4), i.e., for the *contradictories* of the premisses both to be true (and their contraries *both* false, it seems). One *might* see this claim as resting on the thesis that two particular premisses

⁸ For further discussion of this subject, see my articles cited in note 4 and Jonathan Lear, *Aristotle and Logical Theory* (Cambridge, 1980), Chapter 2.

⁹ For a survey of the various interpretations offered see Mignucci, pp. 221–9, and I. Husik, 'Aristotle on the Law of Contradiction and the Basis of the Syllogism', *Mind* 15 (1906), 218–20.

never syllogize, but all we have in Aristotle's text is the assertion that the situation is possible. Further down, Aristotle seems (perhaps for the only time in the *Posterior Analytics*) to appeal to a mood with a particular conclusion, viz. *Darapti*:

And again, it is false to suppose that what belongs to all B belongs to no A. For it is necessary, if it belongs to all B, for it to belong to some A.

(80b10–12)

Since the underlying assumption of the case is that 'A belongs to no B' is false (that is, 'wholly false': thus, A belongs to *all* B), this seems to be an application of the mood *Darapti*. C. 17 for the most part repeats the claims of c. 16, this time supposedly dealing with mediate rather than immediate propositions. In fact, there is little difference in content, and 81a5–14 cite and quickly recapitulate 80a27–b16. Ross (p. 13) finds at 80b23 another reference to the thesis that the minor premiss of a first-figure syllogism must be affirmative, but the case is precisely like that at 79b16–20: a universal negative and a universal affirmative premiss syllogize in the first figure only if the minor premiss is affirmative. Again, Ross finds confirmation of his view in the use of the expression 'major term' (μεῖζον ἄκρον) at 80b20 (p. 13). Yet this terminology of major, minor, and middle terms, although found in *An. Pr. A*, is one of the more problematic features of that work. It is, in fact, impossible to see any simple reason why these terms should be applied except in the single case of a syllogism in *Barbara* with true premisses: here, and here alone, the major term must be greatest in extension, the minor least, and the middle in between. It has been suggested that Aristotle's terminology derives from just these limited cases, assuming (as is very likely true on other grounds) that syllogisms in *Barbara* were the first syllogisms to attract Aristotle's attention.¹⁰ If this is so, then this terminology is very likely as old as the earliest stages of the syllogistic. At most, then, we have evidence here that Aristotle knew the mood *Barbara* and had some sort of schematic notion of a syllogism.

These two chapters do, in part, presuppose more acquaintance with the syllogistic than the rest of *An. Post. A*. However, their subject is not in fact required for any further claims in the work. I do not wish to infer from this that they are 'later additions' to some original text, although they may be later in origin than some other chapters. However, it is at least true that all the doctrines of the remaining chapters could have been developed without the material on ἄγνοια κατὰ διάθεσιν λεγομένη.

(e) According to Ross, chapter 21 'says that a negative conclusion may be proved in three ways, and this turns out to mean "in each of the three figures"' (p. 13). Now, the purpose of this chapter is to prove that if any series of terms each of which is universally true of its successor (I will call such a series an '*A*-series') must be finite, then any expanded demonstration of a negative proposition which demonstrates its premisses from other premisses, those new premisses from others, etc., must eventually 'come to a stop' with 'immediate' propositions incapable of proof. The strategy of the argument is to show that any such expansion of a demonstration must add new middle terms at each step to an *A*-series containing either the major or the minor term. Then, the eventual termination of the expanded demonstration follows from the assumed finitude of all *A*-series. For instance, if (to simplify the case) we imagine an *E*-proposition proved by *Celarent*, the major premiss of which is again proved by a syllogism in *Celarent*, and so on, we will construct an *A*-series of terms over the minor term (i.e. such that each is true of all the minor terms of the previous syllogisms). Aristotle says that 'there are three ways to prove a negative proposition' (τριχῶς γὰρ δέικνυται μὴ ὑπάρχον, 82b4–5), but the supposed illustration of the third figure

¹⁰ See, for instance, Lynn Rose, *Aristotle's Syllogistic* (Springfield, Ill., 1968), pp. 9–12.

(82b21–8) is problematic for several reasons. The text begins *ὁ δὲ τρίτος τρόπος ἦν* and continues with an example that is either *Bocardo* or *Felapton*. There are, as Barnes notes (p. 165), a number of difficulties with this text, and commentators from Philoponus (232. 3–25) to Mignucci (pp. 433–5) have proposed any number of inventive solutions. The principal difficulty is this: since *Bocardo* (and the third figure generally) has a particular conclusion, it cannot be a means of establishing an *E*-proposition. But Aristotle says at 82b14–16 that the *E*-premiss in *Camestres* might be proved ‘through the way above’ – i.e., *Celarent* – or ‘through this one’ – *Camestres* itself – ‘or through the third’. Moreover, if we are to discuss syllogisms with *O*-conclusions, what about *Ferio*, *Festino* and *Baroco*? Of course, the first two of these also introduce *I*-propositions, a subject never touched in the entire section (cc. 19–22) on the subject of the eventual termination of expanded demonstration. For these and other reasons, Barnes concludes that the *τρίτος τρόπος* is simply *Cesare*, the remaining mood with an *E*-conclusion, and that 82b21–8 are a later gloss. Supporting this is the fact that at 85a10–11 in c. 23, *ὁ τρίτος τρόπος* is (as Ross himself argues on p. 587) a reference to just this mood, again the last considered of the three ways to prove an *E*-conclusion. Ironically, Ross excises *ἢ μὴ παντί* at 85a9, saying that it is very likely ‘a gloss, introduced by a scribe who thought that A. was not confining himself to syllogisms having universal conclusions’. We can see a reference to the third figure here only if we suppose Aristotle to have thought demonstrations possible in that figure. Yet commentators often cite the requirement of universality in demonstration as an explanation for *omission* of consideration of the third figure, and of particular propositions generally, throughout *An. Post. A*. If we suppose, in view of these difficulties, that 82b12–28 is inauthentic, we have again only references to the four universal moods: *Barbara*, *Celarent*, *Camestres*, *Cesare*.

(f) Chapter 23, 84b31–85a12, refer, as Ross notes, to arguments in *Barbara*, *Celarent*, *Camestres*, and *Cesare*. I note that these are all.

(g) In c. 29 we find, after a discussion concerning only *Barbara*, the remark ‘Examine also (*ἐπισκέψασθαι δέ*) how many ways it is possible for there to be a syllogism of the same thing through the other figures’ (87b16–18). The fact that this is one of Aristotle’s memoranda to himself makes the incomplete character of this text obvious. Even so, nothing is presupposed here beyond *Barbara* and some system of figures.

Summarizing all this examination, what we find is that *Posterior Analytics A* does not at all presuppose the development of the theory of syllogisms given in *Prior Analytics A*. Except for c. 14 and some arguments in cc. 3 and 16–17, all that is actually required is knowledge of the four universal syllogisms *Barbara*, *Celarent*, *Camestres*, *Cesare*. Of course, this presupposes the basic terminology of syllogisms, with the nomenclature of major, middle and minor terms and some sort of classification into figures. However, all the claims made about the syllogistic – that two negatives never syllogize, that a negative conclusion requires one negative and one affirmative premiss, etc. – are illustrated by (and of course true of) this more limited system. It would thus have been possible for Aristotle to write virtually all of *Posterior Analytics A* without knowing any more than this about syllogisms. Furthermore, the texts which do depend on more detail (73a6–20 and cc. 14, 16, 17) are in all cases unnecessary to any further claims made in *An. Post. A* and in at least one case (73a6–20) badly suited to the surrounding text. I believe this shows that there is no historical impossibility in supposing the content of these sections to be later in origin than the main doctrine of *An. Post. A* and in further supposing that Aristotle had largely worked out this theory of demonstration before he had completed the theory of the syllogism presented in *An. Pr. A*.