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The Roots of the Notion of Containment in Theories of Consequence

Boethius on Topics, Containment, and Consequences

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Abstract

In medieval theories of consequence, we encounter several criteria of validity. One of these is known as the containment criterion: a consequence is valid when the consequent is contained or understood in the antecedent. The containment criterion was formulated most frequently in the thirteenth and fourteenth centuries, but it can be found in earlier writings as well. In *The Tradition of the Topics in the Middle Ages*, N.J. Green-Pedersen claimed that this criterion originated with Boethius. In this article, the author shows that a notion of containment is indeed present in Boethius, but is not used to define or describe the relation between antecedent and consequent, i.e., the relation of consequence, as Green-Pedersen asserted. The author then offers two interpretations of the notion of containment that are present in Boethius – a metaphysical and a semantic interpretation – and shows how these relate to the containment criterion.

Keywords

Boethius – containment – consequences – topics

The notion of consequence (*consequentia*) is notoriously ambiguous. It may alternately refer to a conditional sentence, to a (syllogistic) argument, or to the relation of entailment holding between two or more propositions. Hence when we ask whether a consequence is a good consequence, we may be asking different things. When asking whether 'If Socrates is a man, Socrates is an animal' is a good consequence, we ask whether this conditional is true. But

when asking whether ‘Socrates is a man; all men are mortal; therefore Socrates is mortal’ is a good consequence, we ask whether this argument is valid.

For many medieval logicians, these two types of questions were intertwined. In answering them they appealed to different criteria of validity (or goodness/truth). The three criteria used most often are (1) (necessary) truth-preservation, (2) substitutivity, and (3) containment.¹ In this paper I will focus on the notion of containment. According to what we may call the ‘containment criterion’, a consequence is good iff the consequent is contained or understood in the antecedent (or the conclusion in the premises). It was a popular criterion in the thirteenth and fourteenth centuries, but it was also used in earlier writings. It is not yet clear where the criterion originates, however. The first of the few scholars to concern themselves with this issue was N.J. Green-Pedersen. In *The Tradition of the Topics in the Middle Ages* he briefly indicates Boethius as a source of the containment criterion, saying that

the origin of this definition of consequence or rather of valid (*bona*) consequence is plainly found in Boethius’ manner of defining a conditional sentence, in the *De hypotheticis syllogismis*. [...] Boethius states the same definition of a conditional sentence in the [*In Ciceronis Topica*] [...] but here in words which bring it even closer to the medieval phrasing.²

In this paper I investigate whether Boethius could indeed be seen as a source for the containment criterion. On the one hand, I show that the passages Green-Pedersen refers to provide no evidence for his claim that Boethius was the source or origin of the containment criterion as used for consequences. On the other, I point out that some of the other passages in which Boethius speaks about containment do seem to come close to the notion used in the

1 See C. Dutilh Novaes, “Medieval Theories of Consequence,” in *The Stanford Encyclopedia of Philosophy*, ed. E.N. Zalta (Summer 2012 Edition), for an overview of the uses of these three criteria. It appears that the term ‘containment’ was introduced in this context by C.J. Martin, “Embarrassing Arguments and Surprising Conclusions in the Development of Theories of the Conditional in the Twelfth Century,” in *Gilbert de Poitiers et ses contemporains. Aux origines de la Logica modernorum*, ed. J. Jolivet and A. de Libera (Naples, 1987), 377-401, at 392-94.

2 N.J. Green-Pedersen, *The Tradition of the Topics in the Middle Ages. The Commentaries on Aristotle’s and Boethius’ Topics* (Munich, 1984), 276. When Green-Pedersen speaks of the definition of a consequence, he means the conditions under which a consequence is good, true, or valid – in other words, he is referring to its criterion of validity. “This definition” is introduced a page earlier as “a common way of stating it is to say that the consequent is understood in or included in (*intellegitur in/est de intellectu/includitur in*) the antecedent,” which is a common way to phrase the containment criterion.

containment criterion. Based on these passages I will conclude that it is probable that Boethius was a source for the containment criterion. In that sense the aim of this paper is a modest one; whether Boethius actually was a source for the containment criterion – especially the criterion as it is used in the thirteenth and fourteenth centuries – goes beyond the scope of this paper.³ This paper is first and foremost about Boethius.

The paper is structured as follows. In the first section I present some canonical formulations of the containment criterion to give a sense of what we are looking for in Boethius. In view of the fact that one of the passages Green-Pedersen refers to is in a work on topics – Boethius' *In Ciceronis Topica* – I elaborate on the relationship between topics and consequences in section two, which will clarify the (potential) pertinence of the passage Green-Pedersen refers to. In section three I take a closer look at these passages in Boethius, focusing on the passage from *In Ciceronis Topica*, since it is the most promising. I argue that Boethius did not use the containment criterion, nor a precursor of it, in this passage. Instead, I point to a different passage in *In Ciceronis Topica*, in which we find a notion of containment very close to that used in the containment criterion. After doing so I present two interpretations of containment based on other works by Boethius: a metaphysical and a semantic interpretation.

Boethius himself does not explicitly connect any notion of containment to consequences, but in the fourth and final section I show how his notions of containment could relate to the containment criterion as used for consequences. One major difference is that the notions of containment in Boethius are applicable to terms, whereas – at least at first glance – the notion of containment as used in the containment criterion seems to be propositional. I here point out that ancient and medieval logics tend to alternately interpret variables as either terms or sentences, and suggest that this could be why the notion(s) of containment came to be applied to consequences.

3 This paper is part of a more encompassing study of the notion of containment as used in (relation to) theories of consequence from Boethius until the fourteenth century. As such, it is part of a genealogy of this notion of containment. See C. Dutilh Novaes, "Conceptual Genealogy for Analytic Philosophy," in *Beyond the Analytic-Continental Divide: Pluralist Philosophy in the Twenty-First Century*, ed. J.A. Bell, A. Cutrofello, and P.M. Livingston (London, 2015), 75-110, for more on conceptual genealogies.

1 The Containment Criterion

In its most general formulation the containment criterion states that a consequence is good or valid iff the consequent is contained or understood in the antecedent. As already mentioned this criterion is most clearly formulated by thirteenth- and fourteenth-century authors. In this section I present some of the canonical formulations of the criterion from those centuries.⁴ This will give us a baseline to compare Boethius' uses of the notion of containment to. Whereas some philosophers used containment as a criterion of validity for all consequences in general, most used it for a specific subset of consequences. In the thirteenth century the containment criterion is most often used to define a subset of consequences called natural consequences. Robert Kilwardby (ca. 1215-1279), for example, holds that "consequence is twofold, namely essential or natural (as when the consequent is naturally *understood in the antecedent*), and accidental consequence."⁵ And Walter Burley (ca. 1275-1344), who writes in the early fourteenth century but still relies heavily on thirteenth-century developments, says that some consequences

are natural, and that is when the antecedent *contains* the consequent; and such a consequence holds by an intrinsic topic. A consequence is accidental which holds by an extrinsic topic, and that is when the antecedent does not contain the consequent.⁶

Kilwardby and Burley distinguish between two kinds of consequence, natural and accidental. Accidental consequences are the ones with an impossible antecedent or a necessary consequent, such as 'If God does not exist, tomatoes are blue' or 'If tomatoes are blue, God exists'. These consequences are merely truth-preserving. Natural consequences, on the other hand, require more

4 A reader familiar with the containment criterion may wonder why there is no mention of Peter Abelard here. For one, the passage in which Abelard introduces his containment criterion is neither clear nor short. More importantly, however, I believe that Abelard in fact uses two different notions of containment, which would complicate matters unnecessarily for the purposes of this paper. For said passage see Petrus Abaelardus, *Dialectica* III, liber 1 (ed. L.M. de Rijk, Assen, 1970, 253-55).

5 Robertus Kilwardby, *Notule libri Priorum*, lectio 55 (ed. P. Thom and J. Scott, Part 2, Oxford, 2016, 1140): "Duplex est consequentia, scilicet essentialis vel naturalis (sicut quando consequens naturaliter *intelligitur in antecedente*), et consequentia accidentalis."

6 Gualterus Burlaeus, *De puritate artis logicae. Tractatus longior* II, pars 1, c. 1 (ed. P. Boehner, St Bonaventure, NY, 1955, 61): "Quaedam naturalis, et est quando antecedens *includit consequens*; et talis consequentia tenet per locum intrinsecum. Consequentia accidentalis est, quae tenet per locum extrinsecum, et est quando antecedens non includit consequens."

than truth-preservation. They are defined as the consequences in which the consequent is understood (*intellegitur*) or contained (*includitur*) in the antecedent. All consequences that are not accidental are natural, including syllogisms. The go-to example of a natural consequence is ‘If he is a man, he is an animal’.

In the British tradition of the fourteenth century the containment criterion is used to define a subset of consequences called formal consequences. They are again opposed to another subset of consequences, which are here called material consequences. ‘Formal’ here should not be taken in its modern sense; these formal consequences do not hold because of their logical form. Instead, these formal consequences – like the natural consequences in the earlier tradition – are the ones where the consequent is understood in the antecedent. Robert Eland,⁷ for example, says that

General rules are given in order to appreciate when a consequence is formally valid. The first is this: where the consequent is formally understood in the antecedent. For example, this consequence is formally valid: ‘There is a man, so there is an animal’ because the consequent ‘animal’ is formally understood in the antecedent, namely, ‘man’.⁸

As these passages show, different authors phrase the containment criterion in different ways. They even use different words for the notion of containment: Kilwardby and Eland used *intelligi in*, and Burley, in the passage cited, used *includere*.⁹ This goes to show that there is not one, clear-cut, canonical formulation of the criterion. Of course, this difference in vocabulary need not imply a difference of meaning, but it does make it more difficult to judge whether Boethius could have been a source for the containment criterion. The most important thing all the uses of the criterion have in common is that they

7 While mostly referred to as Fland, his name was actually Robert Eland. See S. Read and M. Thakker, “Robert Fland, or Elandus Dialecticus?,” *Mediaeval Studies* 78 (2017), 167–80. We do not know when Robert was born or when he died.

8 As translated in S. Read, “Inferences,” in *The Cambridge History of Medieval Philosophy*, ed. R. Pasnau (Cambridge, 2010), 173–84, at 175, from Robertus Eland, *Consequentiae* (ed. P.V. Spade, “Robert Fland’s *Consequentiae*: An Edition,” *Mediaeval Studies* 38 [1976], 54–84, at 57): “Ad cognoscendum quando consequentia est formalis dantur regulae generales. Prima est ista: Ubi consequens intellegitur in antecedente formaliter. Verbi gratia, ista consequentia est formalis ‘Homo est; igitur animal est’ quia hoc consequens ‘animal’ formaliter intellegitur in antecedente, scilicet, ‘homo.’”

9 The word ‘*continere*’ is used surprisingly little in formulations of what we call the containment criterion. One philosopher who does use *continere* is Abelard: Petrus Abaelardus, *Dialectica* III, liber 1 (ed. De Rijk, 253–55).

define a certain kind of consequence by means of a notion of containment and, crucially, in doing so say that the antecedent somehow contains the consequent. So it seems that this notion of containment is *propositional*: one proposition, the antecedent, is said to contain another, the consequent.¹⁰

Another thing these descriptions of the containment criterion have in common is that they involve more than 'mere' truth-preservation. Instead, there is some kind of meaningful connection between the antecedent and consequent, which is not the case for accidental or material consequences. The question, of course, is what this connection amounts to. In other words, what do these philosophers *mean* by this notion of containment? Two main interpretations have been proposed: containment is to be taken either semantically or epistemically.¹¹ On a semantic reading the meaning of the consequent is conceptually contained in the meaning of the antecedent. On an epistemic (or psychological) reading containment is closely related to the understanding of the consequence by an epistemic agent. On such a reading the antecedent is contained in the consequent because anyone who thinks/imagines/believes the antecedent will also think/ imagine/ believe the consequent. There is, of course, much more to say about these two interpretations and their respective merits, but such a debate would exceed the scope of this paper. For present purposes this brief exposition will suffice.

2 Consequences and Topics

The containment criterion as used in the thirteenth and fourteenth centuries is employed to define (a subset of) consequences. What interests us in this paper is the question whether Boethius can be seen as a source or origin of this criterion. Green-Pedersen supported this claim by referring to a passage in *In Ciceronis Topica*. As the title already reveals, this work does not deal with consequences, but with topics. In this section I show how topics and consequences are connected.

¹⁰ One might object that Eland referred to the terms 'man' and 'animal' as the antecedent and consequent, which suggests he is not thinking about propositions. This will be picked up again in section 4, where I will discuss it in much more detail.

¹¹ For epistemic readings see I. Boh, "Four Phases of Medieval Epistemic Logic," *Theoria* 66 (2000), 129-44, at 138; C. Normore, "The Necessity in Deduction: Cartesian Inference and Its Medieval Background," *Synthese* 96 (1993), 437-54, at 449; C. Dutilh Novaes, *Formalizing Medieval Logical Theories: Suppositio, consequentiae and obligationes* (Dordrecht, 2007), 83. For semantic readings see Read, "Inferences," 177-78; Green-Pedersen, *The Tradition of the Topics in the Middle Ages*, 276-78.

The history of the theory of topics begins, as do so many things, with Aristotle. Whilst many works were written on the topics between Aristotle and Boethius – Theophrastus, Strato, Eudemus, Themistius, Alexander of Aphrodisias, and Ammonius Hermiae all wrote commentaries on the *Topics* – little remains of them. The two works that are still extant are Alexander of Aphrodisias' commentary and Cicero's *Topics*.¹² Boethius himself wrote two works on the topics, *De topicis differentiis*, in which he incorporates both Cicero's and Themistius' views on topics, and *In Ciceronis Topica*.¹³ The latter, a commentary on Cicero's *Topics*, is especially relevant here, since it is the main candidate for being a source of the containment criterion.¹⁴

Boethius entertains two different definitions of 'topic'. On the one hand, a topic (*topos*, *locus* or place) is a general statement that provides the warrant for an argument – Boethius calls these maximal propositions. This is the definition Aristotle himself uses in his *Topics*, Boethius says. On the other, a topic is the universal differentia that several maximal propositions have in common, such as 'genus' or 'definition'.¹⁵ An example is helpful here: one can argue that someone who boycotts Shell because their oil is obtained through immoral means should also boycott BP, since it is similar in this respect. In doing so, we appeal to a maximal proposition along the lines of 'What is appropriate for one similar is appropriate for another similar too'. The corresponding universal differentia is 'similar', so Boethius will say that we have just used the topic from similarity. In *In Ciceronis Topica* Boethius mostly uses this second sense of 'topics' as universal differentiae, since, so Boethius explains, this is how Cicero uses the notion in his *Topics*.

The purpose of a theory of topics is to provide a means for the discovery of arguments.¹⁶ But topics do more than that. Boethius also seems to think

12 Alexander Aphrodisiensis, *In Aristotelis Topicorum libros octo VIII commentaria*, ed. H. Diels and M. Wallies (Berlin, 1981); Marcus Tullius Cicero, *Topica*, ed. et trans. T. Reinhardt (Oxford, 2006). For the lost commentaries, cf. Green-Pedersen, *The Tradition of the Topics in the Middle Ages*, 37-38; M. Spranzi, *The Art of Dialectic between Dialogue and Rhetoric: The Aristotelian Tradition* (Amsterdam, 2011), 39.

13 Boethius, *In Ciceronis Topica* (ed. J.C. Orelli, Turin, 1833; trans. E. Stump, Ithaca, NY, 1988). All translations in this paper are based on Stump, but have been altered where deemed fit.

14 Since *In Ciceronis Topica* is a commentary on Cicero's *Topics*, one might wonder if Boethius is not drawing on Cicero when speaking of containment. As it turns out, there is no mention of containment in Cicero at all.

15 Boethius, *In Ciceronis Topica* I (ed. Orelli, 281).

16 Boethius, *In Ciceronis Topica* I (ed. Orelli, 275-76). Boethius explains that the purpose of the *Analytics* is to explain how to judge arguments, whereas that of the *Topics* is to provide a means for the discovery of arguments. In looking for an argument, one is looking for a middle term to connect the minor and major terms in the conclusion. Hence later

that topics ground the validity of consequences¹⁷ – hence they are sometimes referred to as the “seat” of an argument (*argumenti sedes*). This is not an uncommon view. Some theories of consequence developed later on explicitly state that certain consequences hold in virtue of certain kinds of topics. We have, in fact, already come across an example of such a theory in Walter Burley. In the passage cited in section one we find him explicitly stating that natural consequences, which are the consequences defined in terms of the containment criterion, hold in virtue of an intrinsic topic.

How do Boethius’ topics ground consequences? Some more examples may be useful. Suppose one wants to argue that the moon is currently eclipsed because the earth is placed between the sun and the moon. One can do so by appealing to the conditional ‘If an eclipse of the moon occurs, the earth is placed between the sun and the moon’. In that case, one has used the topic from conditionals, more specifically the topic from antecedents.¹⁸ This topic can be used to argue that one thing follows another on the basis of a conditional proposition. If the conditional and the antecedent of this conditional are given, one can use these to argue to the consequent. So given the conditional ‘If an eclipse of the moon occurs, the earth is placed between the sun and the moon’ and the fact that the moon is currently eclipsed, one can use the topic from conditionals to argue that this means that the earth is placed between the sun and the moon.

Another example: suppose Socrates leaves all his silver to Plato. Upon Socrates’ death, the question arises whether his coins are for Plato too. Since these coins are a species of the genus silver, Boethius argues, the coins are to be given to Plato too. This topic is a topic from genus. These topics, then, are general rules based on the relationship between the terms used in an argument (or more properly, between what these terms designate). They are adduced to validate the transition from premises to conclusion. It is important to note, though, that there is a difference between what kinds of arguments these two topics validate.

philosophers will also say that the purpose of the *Topics* is the discovery of such a middle term.

- 17 Which is not to say that the theory of consequences developed from the theory of topics. This is a completely different issue, which Green-Pedersen discusses in quite some detail in *The Tradition of the Topics in the Middle Ages*, 265–95.
- 18 The topic from conditionals encompasses three topics: the topic from antecedents, the topic from consequents, and the topic from incompatibles. The topic from antecedents is a forerunner of *modus ponens* arguments, whereas the topic from consequents resembles *modus tollens*.

Suppose one tries to argue that sea anemones are alive, and does so by appealing to the fact that they are animals, saying that ‘If they are animals, they are alive’. It seems we could construe this argument both as a topic from conditionals, because it appeals to a conditional, and as a topic from genus, since it appeals to the genus animal. In fact, Boethius says, we may worry that the topic from conditionals is superfluous, for conditionals will always be drawn from wholes, parts, similars, species, genus, and all the other topics.¹⁹ For example, ‘If the family is ill, the mother is ill’ is drawn from a whole, and ‘If one boycotts Shell, one should boycott BP’ is drawn from similars. Now what then, one might wonder, does the topic from conditionals add? If the conditional always encompasses another topic, can we not just use that other topic instead?

No, Boethius says, it is crucial to distinguish between these topics, since there is a difference in their force (*vis*). Arguments drawn from the other topics are suited for categorical syllogisms, since they use predicative propositions in which something is asserted (*proponitur*) to be the case. Now, of course, predicative propositions can be turned into conditionals, but they are thereby “undoubtedly rendered a different proposition.”²⁰ For conditionals state that *if* something is the case, something else follows. Hence the topic from conditionals, Boethius goes on to explain, is not superfluous, because it leads to a different kind of argument than the other topics. And “even if a conditional argument might be drawn from the other topics, it nevertheless has a certain form of its own, inasmuch as it consists in preceding and following [...] the Topic [of a conditional argument] consists in the condition.”²¹ So whereas those other topics ground categorical arguments, hypothetical arguments are grounded in the topic from conditionals.²²

19 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 350): “Nam quodcumque ab antecedentibus et consequentibus ducitur argumentum, id uel a toto, uel a partibus, uel a coniugatis, uel ab aliquo reliquorum tractum esse perpenditur [...]”

20 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 351): “Cum uero praedicatiua est propositio, si ea uertetur in conditionalem, alia nimirum redditur propositio.”

21 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 351): “Quo fit ut etiamsi per caeteros locos conditionale argumentum proferatur, tamen suam quamdam habeat formam, quandoquidem in antecessione et consecutione est constitutus [...] locus uero in conditione est constitutus.”

22 Just as Boethius here contrasts categorical and hypothetical syllogisms, in his *De topicis differentiis* Boethius contrasts predicative and hypothetical questions. He there says that “in a predicative question what is in doubt is whether the predicate *inheres* in the subject term. But in hypothetical questions, what is questioned is only whether what is proposed as the consequent *accompanies* the thing that precedes.” *De topicis differentiis* I (PL 64, col. 1177B25-29): Quae cum ita sint, in praedicatiua quaestione dubitatur an subiecto termino

Topics, then, can be said to ground certain consequences. Most topics ground categorical arguments, but the topic from conditionals grounds hypothetical arguments. As we will see in the next section, the passage Green-Pedersen adduces deals with this topic from conditionals, which makes the passage very pertinent. After all, this is *the* topic explicitly connected to conditionals, and consequently, to antecedents, consequents, and consequences.

3 Topics and Containment

Green-Pedersen argues that Boethius is the source of the containment criterion by referring to two passages, one in *De hypotheticis syllogismis*, the other in *In Ciceronis Topica*. I quote Green-Pedersen in full:

Anyway, the origin of this definition of consequence [*i.e.*, in terms of containment] or rather of valid (*bona*) consequence is plainly found in Boethius' manner of defining a conditional sentence, in the *De hypotheticis syllogismis*. He explains that the meaning (*sententia*) of a conditional sentence – which is constituted by connecting two categorical sentences by 'if' (*si*) or an equivalent – consists in the fact that if the antecedent is, then the consequent necessarily must be too. Boethius states the same definition of a conditional sentence in the *ICT* when he discusses the locus 'from antecedents' etc., *i.e.* the inference-forms of conditionals, but here in words which bring it even closer to the medieval phrasing. He says that the nature of a conditional is such that we cannot grasp or understand (*intellegi*) the antecedent without understanding the consequent.²³

In the first half of this passage Green-Pedersen discusses Boethius' definition of the conditional in *De hypotheticis syllogismis*. According to this definition, a conditional is good or true iff whenever the antecedent is the case, the consequent must necessarily be the case too. This is indeed how Boethius defines a conditional in *De hypotheticis syllogismis*:

In a conditional, on the other hand, we understand this, that if something were to exist which is said to be a man, then necessarily something

praedicatus inhaereat. In hypotheticis uero quaestionibus, illud tantum quaeritur an illam rem quae praecedat comitetur id quod sequens esse proponitur.)

23 Green-Pedersen, *The Tradition of the Topics in the Middle Ages*, 276.

would exist which is called an animal. [...] the meaning of a conditional proposition is this, that something only is, if something else is.²⁴

Yet I do not see how this connects to the notion of containment. All that is claimed is a certain relation of necessity: whenever the antecedent is the case, so too *must* the consequent. The criterion present here is one of necessary truth-preservation or necessary concomitance of truth, not one of containment. There is no mention of containment, nor any implication of it, in *De hypotheticis syllogismis*.

Hence I focus on the *In Ciceronis Topica* passage Green-Pedersen refers to. In the first subsection I argue that there is no trace of (a precursor of) the containment criterion in that passage, despite the presence of the verb *intellegere*. Next, I present a different passage in *In Ciceronis Topica* that uses the notion of containment in a sense that comes very close to its use in the containment criterion, even though it is not used in the exact same sense. Working from this passage I present two notions of containment based on other works of Boethius.

3.1 *What is Not There*

Green-Pedersen refers to a passage discussing the topic from antecedents, where Boethius argues that the topics from antecedents, from consequents, and from incompatibles should all be one topic, namely the topic from conditionals. Here is the passage to which Green-Pedersen is referring:

So the same thought and the same reasoning of the understanding understands what precedes and what follows; for it cannot happen that something is understood as an antecedent unless at the same time it is considered what the consequent is; and in the same way something cannot be understood as a consequent unless it is clear what the antecedent is.²⁵

24 Boethius, *De hypotheticis syllogismis* I, c. 2, §2 (ed. L. Obertello, Brescia, 1969, 210.14-20): “In condicionali uero illud intellegimus, quod si fuerit aliqua res quae homo esse dicatur, necesse sit aliquam rem esse quae animal nuncupetur. [...] condicionalis uero propositionis haec sententia est, ut ita demum sit aliquid, si fuerit alterum.”

25 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 347): “Ergo eadem mens, eademque intelligentiae ratio id quod praecedit et id quod comitatur, intelligit. Neque enim fieri potest ut antecedens aliquid intelligatur, nisi in eodem quid sit consequens consideretur: eodem quoque modo nec consequens, nisi appareat quid praecedat.”

Green-Pedersen interpreted this passage as providing (a precursor of) the containment criterion. It is not evident at all, however, that Boethius here uses the term '*intelligere*' in the same sense in which it is used in the containment criterion later on. It is crucial, I would argue, to distinguish between two ways in which one can interpret '*intelligere*' – *understanding in* and *understanding as*. On the one hand, one could interpret it in the sense of 'containing conceptually': when something is *understood in* something, it is contained conceptually in it. In this sense we can say, for example, that animality is contained in humanity. This is how *intelligere* is used in the containment criterion later on. On the other, however, one can interpret 'understanding' in the sense of 'grasping' or 'seeing as'. In that sense, one can *understand* something *as* an antecedent only because one 'considers the consequent'; in other words, one can only see something as an antecedent when one knows it is accompanied by a consequent; these are relational concepts. Similarly, I can only see or understand myself as a sister when I 'consider' my brother.

There are two reasons to believe that Boethius uses 'understanding' in the second sense here. First, one should consider the context of the passage: Boethius is explaining why the topics from antecedents, from consequents, and from incompatibles are all one topic.²⁶ He discusses an argument – we do not know from whom he got it – which argues that they should be one topic because they are all processed by the same thought or reasoning.²⁷ So in the passage cited Boethius is arguing that antecedents, consequents, and incompatibles are all *understood (intellegi)*²⁸ – this is the term he uses – by the same kind of reasoning. This is an instance of the intellectual faculties grasping or seeing these topics, instead of them containing those topics.

Second, and more importantly, Boethius follows the debated sentence with "in the same way, something is not understood as consequent unless it is apparent what precedes."²⁹ He clearly considers there to be a parallel here ("in the same way"): the described relation between antecedent and consequent is symmetrical. Just as it has to be clear what the consequent is in order to

26 The paragraph starts, Boethius, *In Ciceronis Topica* IV (ed. Orelli, 348): "Antecedentium igitur, atque consequentium, et repugnantium, unum esse locum praediximus, qui quomodo sit unus, paucis ostendam."

27 Mind you, the argument is not a good one. As Boethius says, *In Ciceronis Topica* IV (ed. Orelli, 347): "Quae ratio non ualde uidetur idonea, nec explicat quod demonstrare conabatur."

28 He also uses the term 'consentire' to describe the fact that they are understood by the same faculty: Boethius, *In Ciceronis Topica* IV (ed. Orelli, 347).

29 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 347): "eodem quoque modo nec consequens, nisi appareat quid praecedat."

understand something as antecedent, it has to be clear what the antecedent is in order to understand something as consequent. If Boethius were speaking of containment here, the antecedent would have to be contained within the consequent as well. This is, of course, not the case. So what Boethius wants to say is that one can only think of something as an antecedent if one ties it to its consequent. This passage, then, seems to say that the terms ‘antecedent’ and ‘consequent’ are interdefined or interrelated, not that the consequent is contained in the antecedent.

Therefore, we have to conclude that Boethius neither uses the containment criterion nor a precursor of it in a context of the topic from conditionals. And yet this was the topic that could be related directly to conditionals or consequences.³⁰ This does not mean that Boethius was of no influence at all for the development of the containment criterion. For one thing, medieval philosophers may very well have read the passage above in the same way as Green-Pedersen and found (something akin to) the containment criterion in this very passage. As is clear from Green-Pedersen’s work, Boethius had a major influence on the later development of theories of topics.³¹ Moreover, this interpretation would be strengthened by Boethius’ use of a phrase closely resembling the criterion in another context. For as I will show next, Boethius does introduce something very close to the containment criterion in his discussion of the topics from genus and species.

3.2 *What is There: Two Interpretations of Containment*

Shortly after having argued that the topics from antecedent, consequent, and incompatibles should all be one topic, Boethius turns to a new subject: explaining that this new topic ‘from conditionals’ is different from the topics from genus and species. Boethius appeals to a notion of containment to explain the difference:

So you see that we are here talking about the antecedents and consequents that are located in a conditional proposition and are understood either to precede or to follow. But when an argument arises from a genus, we intend to prove something about a species; we take the genus in the minor premise *not as something preceding but as something containing, so that whatever is observed to be in the genus should also be applied to the species*, for as long as a genus persists, it does not leave its species. And

30 I have found no other references to containment in the *In Ciceronis Topica* and *De topicis differentiis*, except, of course, the one coming up in the next subsection.

31 See especially Green-Pedersen, *The Tradition of the Topics in the Middle Ages*, 81, 198, 209.

when we take an argument from species, it is a genus about which there is some question, and we exert ourselves in order that what we are trying to show about the genus might be more readily known on the basis of the species.³²

Arguments based on the topic from conditionals, Boethius says, involve preceding and following, but an argument based on the topic from genus involves a notion of containment. In such an argument the genus is taken to contain something that the species is then also inferred to contain. For example, since all mammals are mortal, we can infer that human beings are mortal too. This is not exactly the same as the containment criterion proper, but it is closely related to it. To see how, we have to take a closer look at the notion of containment at play.

This relationship of containment holds between a genus and its species. One is probably immediately reminded of the Porphyrian tree: a genus contains its proper species, i.e., the species that are located directly under it in the tree. It is indeed the case that the genus contains the species. This is confirmed by a later passage: “from a genus, from something that contains; from a kind (species), from that which is contained.”³³ It also conforms with Boethius’ *De divisione*.³⁴

Looking back at the passage from *In Ciceronis Topica*, however, we actually want the genus to contain something else – we do not know what – which is then also contained by the species. For “whatever is observed to be in the genus should also be applied to the species.” If the genus were to contain only its species, the species would then have to contain itself. That, however, Boethius explicitly states, is impossible. Container and containee cannot be identical: “For nothing could inhere in itself, and therefore what inheres in something

32 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 350): “Vides igitur ut de his praecedentibus et consequentibus nunc loquamur quae in condicionali propositione posita, uel praecedere uel consequi intelliguntur. Cum uero fit ex genere argumentum, species quidem est de qua aliquid probare contendimus; genus uero assumimus *non quasi praecedens sed quasi continens, ut quidquid esse consideratur in genere, id formae quoquo debeat aptari*. Genus enim quoad permanet, a sua specie non recedit: cum uero de specie sumimus argumentum, genus quidem est de quo aliud quaeritur; sed id laboramus, ut quod de genere conatur ostendere, id ex specie possit facilius agnosci.”

33 Boethius, *In Ciceronis Topica* IV (ed. Orelli, 352): “a genere; a continenti; a forma, ab eo quod continetur.”

34 Cf. Boethius, *De divisione liber* (ed. J. Magee, Leiden, 1998, 20), especially: “Hae igitur differentiae propter quas species consistit ipsae et in definitione speciei et in generis eius divisione quod continet speciem collocantur.”

is different from that in which it inheres.”³⁵ What, then, are the relata of the containment relationship here?

An answer to this puzzle can be found in an appeal to the notion of *per se* inherence. In his commentary on Porphyry’s *Isagoge* Boethius distinguishes between two kinds of inherence: *per se* and *per accidens* inherence:

Something is said to inhere *per se* which informs the substance of something. For if the reason that a species exists is that it is constituted by a substantial differentia, then that differentia is present *per se* to the subject, and not *per accidens* or by any other means. Rather its presence informs the species which it maintains, in the way that rationality [informs] human being.³⁶

Whatever belongs to the substance or nature of a thing inheres in it *per se*. Among the things that inhere *per se* are (substantial) differentiae. The differentia ‘rationality’, for example, belongs to the nature of human being, it is essential to it, and hence it inheres *per se*. A differentia, then, inheres *per se* in the species that it specifies.

Going back to the notion of containment as used in *In Ciceronis Topica*, this seems to be what Boethius is thinking of. A genus contains all the differentiae located above it in the Porphyrian tree, and so do its species. An example: the genus animal contains several species under it, all divided by their own differentiae. But animal itself is already specified by several differentiae: it is a substance that is corporeal, animate, and sensible. All these differentiae inhere in the genus animal *per se*. And these differentiae, which are contained in the genus animal, are all also contained in the proper species of animal, such as human, horse, and giraffe. The containers, then, are both the genus and the species, and the containees are differentiae. On such a reading containment is interpreted metaphysically.

This metaphysical interpretation of containment is mirrored by a semantic (or conceptual) interpretation. Related to the distinction between two kinds

35 Boethius, *In Ciceronis Topica* 1 (ed. Orelli, 285): “Nihil enim in se ipso haerere potest, ac per hoc quod in aliquo haeret ab eo in quo haeret diuersum est.”

36 Boethius, *In Isagogen Porphyrii commenta* IV (ed. S. Brandt, Vienna, 1906, 250): “Per se autem aliquid inesse dicitur quod alicuius substantiam informat. Si enim idcirco quaelibet species est, quoniam substantiali differentia constituitur, illa differentia per se subiecto adest neque per accidens aut per quodlibet aliud medium sed sui praesentia speciem quam tuetur informat, ut hominem rationabilitas.” As translated in C.J. Martin, “The Logical Textbooks and Their Influence,” in *The Cambridge Companion to Boethius*, ed. J. Marenbon (Cambridge, 2009), 56-84, at 57.

of inherence is a distinction between two kinds of inseparability: real and conceptual inseparability. When something is separable in reality, it is a property or differentia that can, so to say, come and go, such as the leaves on this ash tree being green. When it is inseparable in reality, it is a difference that cannot be lost, such as my eyes being blue. Both examples given here, however, are separable conceptually, for one can imagine the tree's leaves being yellow and my eyes being brown without thereby changing anything essential.

In contrast, something is conceptually inseparable when we cannot imagine something without that property. My rationality, for example, is conceptually inseparable from me, since I would not be a human being without it. The things that are conceptually inseparable are exactly those that inhere in something *per se*. This notion of conceptual inseparability is already a semantic notion, since for Boethius the meaning of a term is determined by the concept that it signifies.³⁷ Meaning, that is, is a characteristic of concepts. And concepts are what determine whether something is conceptually (in)separable.

Because of this relation between the notions of *per se* inherence and conceptual inseparability there is a close parallel between the metaphysics and the semantics of containment in Boethius. Just as one can say that the genus animal contains a number of differentiae that hence also have to be contained by its species human being, so the concept animal contains a number of, so to say, 'conceptual differentiae' that should also be ascribed to the concept of human being. Another way to phrase this is to say that these differentiae are part of the definition of human being. The elements of a concept's definition, in turn, are the properties that belong to the essence of the thing of which it is a concept, i.e., the properties that belong to it *per se*.³⁸

Now that we have seen which notions of containment can be found in Boethius, the question remains whether they could have been a source for the containment criterion. So we have to see whether the metaphysical and semantic notions of containment can be connected to the containment criterion and, if so, how.

37 Cf. Martin, "The Logical Textbooks and Their Influence," 61-62.

38 Cf. Boethius, *De divisione liber* (ed. Magee, 16), where Boethius explains that division and definition "are in essence concerned with the same thing, since a unified definition is a conglomeration of linked divisions." (*[I]n eodem divisionis definitionisque ratio versetur, nam divisionibus iunctis una componitur definitio.*) This again shows that there is a close link between the metaphysical and semantic levels.

4 Containment and Term – Sentence Ambiguity

According to the containment criterion, the antecedent of a valid consequence is said to contain the consequent. In the topic from genus the genus is said to contain something that the species is then also said to contain. It is clear that the notions of containment used in this passage from *In Ciceronis Topica* and in the containment criterion are not exactly the same. Yet both of these notions can be explicated metaphysically by appealing to the notion of *per se* inherence. We have already seen that in the case of *In Ciceronis Topica* what inheres *per se* in both the genus and the species are differentiae. In the case of the containment criterion matters are a bit more complicated.

The reason why becomes clear when one reflects on the rather remarkable nature of the containment criterion. According to this criterion one proposition, the antecedent, contains another proposition, the consequent. Contemporary logicians generally do not think of the relationship between antecedent and consequent in terms of containment.³⁹ Instead, they would say that the one proposition follows from the other. And as we have seen in the previous sections, Boethius too thinks of the relationship between antecedent and consequent as a relationship of preceding and following. Moreover, the notion of containment as analysed above is more properly applied to concepts or terms (or to the things they designate), and not to propositions. So where does this idea of the antecedent *containing* the consequent come from?

My suggestion is that this is due to an ambiguity between term and sentence logics. In contemporary philosophy there is a clear distinction between propositional and predicate logics. In ancient and medieval logics the distinction is not so clear. Consider a consequence of the form ‘If A, B’. On the one hand, we could substitute these variables with sentences, e.g., ‘If it is light, it is day’. This would be a grammatically correct substitution. On the other, we could see the consequence as elliptical and substitute the variables with terms, e.g., ‘If (*x* is a) man, (*x* is an) animal’. And indeed, Boethius himself often tends towards this latter option. In his *De hypotheticis syllogismis*, for example, he refers to variables like A and B as terms (*termini*). This ambiguity between substituting the variables with terms or propositions, especially in the case of hypothetical syllogisms, was common amongst the Peripatetics. This has been set out in quite some detail by Jonathan Barnes.⁴⁰ Since Boethius leans heavily

39 The obvious exception being compound propositions. But we are clearly not thinking of compound propositions here, but of a proposition like ‘Socrates is a man’ containing ‘Socrates is an animal’.

40 Cf. J. Barnes, *Logical Matters. Essays in Ancient Philosophy II* (Oxford, 2012), 443–449.

on this tradition, he too appears to combine term and sentence logics. It would be too uncharitable, however, to say that he conflates or confuses these logics, since they were not clearly distinguished to begin with.

In fact, not making this distinction has arguably had one major advantage. I believe that the fluidity between terms and sentences may have facilitated the transfer of the concept of containment, which was originally a notion only applied to terms (and their designates), to the realm of sentences and consequences. And indeed, if we look back to the canonical formulations of the containment criterion cited at the beginning of this paper, we see that this ambiguity is still present in the fourteenth century. Robert Eland said that the consequence 'There is a man, so there is an animal' is formally valid because the consequent 'animal' is understood in the antecedent 'man'. So he too still thinks of the antecedent and consequent as terms (as well as propositions).

Now that we know that antecedent and consequent are often seen as terms as well, we can see how Boethius' metaphysical and semantic notions of containment can be applied to the containment criterion. Consider the oft-used example 'If he is a man, he is an animal'. On a metaphysical level the genus animal inheres *per se* in the species man, in the sense that the genus is a part of the essence or form of the species. As we have seen, there is a close connection between the metaphysical and the semantic interpretations of containment. It comes as no surprise, then, that the notion of containment used in the containment criterion can also be interpreted semantically. The species human being has as its definition 'rational mortal animal' – so its genus, animal, is a part of this definition, and hence the genus is contained conceptually in the species. As we saw in section one, this is one of the main interpretations of the containment criterion in the thirteenth and fourteenth centuries.

Conclusion

The question where the containment criterion as used in medieval theories of consequence originates has not been studied in great detail. Green-Pedersen, who was the first scholar to consider this matter, suggested that Boethius was the source of the criterion and pointed to a passage in his *In Ciceronis Topica* to support this claim. In the course of this paper I have argued that Boethius does not use the containment criterion, nor a precursor of it, in said passage. But I have also shown that Boethius used a notion of containment in another passage in *In Ciceronis Topica*, when defining the topic from genus. I then presented two interpretations of containment on the basis of other works by

Boethius, and I connected these interpretations to both Boethius' definition of the topic from genus and to the containment criterion as it was formulated later on.

It was the aim of this paper to investigate whether Boethius could have been a source for the development of the containment criterion. While it is now clear that Boethius himself did not use the containment criterion, the notions of containment that are present in *In Ciceronis Topica*, in his commentary on Porphyry, and in *De divisione* can be connected to the containment criterion. This connection can be made because of the fluidity between term and sentence logics that permeates ancient and medieval logics. Of course, these notions of containment are not unique to Boethius. But since he was a major source for later medieval discussions, and considering the close overlap between the notions of containment at stake, it is certainly plausible that the development of the containment criterion was influenced by his works.