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# Causality, contingency and science in Robert Kilwardby

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**Abstract:** This paper examines Robert Kilwardby's (ca. 1215-1279) treatment of causal necessity and contingency. In his Commentary on Aristotle's *Posterior Analytics* and in his *De ortu scientiarum*, Kilwardby seems to be particularly concerned with the precarious epistemological status of ethics and physics insofar as these disciplines deal with contingent events. In order to reconcile strictly scientific knowledge with conjectural forms of knowledge, Kilwardby sets the problem of contingency in a genuinely gnoseological rather than metaphysical context, arriving at a highly original account of contingency.

**Keywords:** Causality, contingency, knowledge, science, Robert Kilwardby.

**Resumen:** El presente artículo examina el concepto de necesidad causal y de contingencia en Roberto Kilwardby (ca. 1215-1279). Este autor, en su Comentario a los *Segundos Analíticos* de Aristóteles y en el *De ortu scientiarum*, parece particularmente interesado en el precario estatuto epistemológico de la ética y de la física en tanto que estas disciplinas versan sobre acontecimientos contingentes. Con el fin de reconciliar el conocimiento científico en sentido estricto con formas conjeturales de conocimiento, Kilwardby sitúa el problema de la contingencia en un contexto auténticamente gnoseológico, más que metafísico, llegando así a una explicación altamente original de la contingencia.

**Palabras clave:** Causalidad, contingencia, conocimiento, ciencia, Roberto Kilwardby.

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## 1. INTRODUCTION

Although Robert Kilwardby (ca. 1215-1279) is generally acknowledged to be among the most significant figures of the 13<sup>th</sup> Century, he has not received much scholarly attention during the last decades<sup>1</sup>. Thus, his most outstanding work, the *De ortu scientiarum*, which was published in a critical edition more than 30 years ago, still awaits a thorough doctrinal study<sup>2</sup>.

However, it seems that, recently, interest in Kilwardby both as a theologian and as a philosopher has been on the rise. As far as theology is concerned, we now have at our disposal a critical edition of the Archbishop of Canterbury's *Sentences Commentary*<sup>3</sup>, while Inos Biffi has made the first attempt to give a survey of his theological teachings<sup>4</sup>. And also with respect to the historiography of philosophy, highly important advances in our understanding of Kilwardby are being made: In this regard, we should mention first of all the works by Debora Cannone, who has prepared an edition of Kilwardby's Commentary on Aristotle's *Posterior Analytics*<sup>5</sup>, and has also presented a specimen of his exegetical *modus procedendi* in that Commentary in an article published recently in *Documenti e studi sulla tradizione filosofica medievale*<sup>6</sup>.

My concern in this article is to make a modest contribution to the study of Kilwardby, by examining his treatment of the problem of causal necessity and contingency within his epistemological ac-

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1. The only monographical study devoted to Kilwardby of which I know, dates from 1937: E. M. F. SOMMER-SECKENDORFF, *Studies in the Life of Robert Kilwardby O.P.* (Istituto Storico Domenicano, Roma, 1937).
  2. The most comprehensive study of this work still remains that of Sharp, a study published long before the critical edition of the text and which is in fact but a summary of its contents: D. E. SHARP, *The 'De ortu scientiarum' of Robert Kilwardby (d. 1279)*, "The New Scholasticism" 8 (1934) 1-55.
  3. Cfr. the recent edition: E. GÖSSMANN, G. HAVERLINK, G. LEIBOLD, R. SCHENK y J. SCHNEIDER (eds.), *Quaestiones in quattuor libros sententiarum* (Bayerische Akademie der Wissenschaften, München, 1982-1995), 6 vols.
  4. I. BIFFI, *Figure medievali della teologia* (Jaca Book, Milano, 1992) 261-334.
  5. D. CANNONE (ed.), *Le 'Notule Libri Posteriorum' di Robert Kilwardby nella tradizione esegetica latina medievale del XIII secolo*, Vol. 2 (unpublished doctoral thesis, Cas-sino/Rome, 2003-2004).
  6. D. CANNONE, *Le 'Notule Libri Posteriorum' di Robert Kilwardby: il commento ad 'Analitici posteriori' I, 4, 73a34-b24 (per se)*, "Documenti e studi sulla tradizione filosofica medievale" 13 (2002) 71-135.

count, as this is developed in his Commentary on Aristotle's *Posterior Analytics* and in his *De ortu scientiarum*. Both of Kilwardby's texts are related to his philosophical period, i.e. the time before his entry into the Dominican Order, even though they are situated at some distance in time from each other: It seems that Kilwardby's Commentary on the *Posterior Analytics* should be dated around 1240, when he started to teach at the Arts Faculty in Paris: Kilwardby, therefore, together with Robert Grosseteste, being among the first to comment upon this book. The *De ortu scientiarum*, on the other hand, which is an encyclopedic division of philosophy in the tradition of Gundissalinus' *De divisone philosophiae*<sup>7</sup>, is usually dated right at the end of Kilwardby's teaching career in Paris, that is to say, approximately 1250, when he joined the Dominican Order, or shortly afterwards.

## 2. THE TYPES OF KNOWLEDGE IN THE COMMENTARY ON THE *POSTERIOR ANALYTICS*

Let us begin with Kilwardby's Commentary on the *Posterior Analytics* or his *Notulae*, as they are called. This work draws heavily upon Robert Grosseteste and his Commentary on Aristotle's text as a source<sup>8</sup>.

As far as the epistemological problem of causal necessity and contingency is concerned, Kilwardby's first engagement with this theme can be found in a passage where, on the occasion of Aristotle's definition of *epistasthai* in *Analytica posteriora* I, 2, Kilwardby distinguishes different kinds of knowing or, as he puts it, of "scire". The passage, which we are going to quote, clearly echoes Grosseteste's Commentary and his wording<sup>9</sup>:

7. R. KILWARDBY, *De ortu scientiarum*, ed. A. G. JUDY (Pontifical Institute for Mediaeval Studies, Toronto, 1976). For some remarks on this work's relation to Gundissalinus' *Divisio* see A. FIDORA, *Domingo Gundisalvo y la teoría de la ciencia arábigo-aristotélica* (Eunsa, Pamplona, 2009) 113-115.

8. However, as D. CANNONE, *Le 'Notule Libri Posteriorum' di Robert Kilwardby: il commento cit.*, 76-77, points out, Kilwardby rearranges and enriches considerably the material he has taken over from Grosseteste.

9. Cfr. the corresponding passage in R. GROSSETESTE, *Commentarius in Posteriorum Analyticorum Libros*, ed. P. B. ROSSI (Leo S. Olschki, Firenze, 1981) 99-100.

“Furthermore, it should be understood that ‘to know’ is said in four ways: (1) in its broadest sense, it refers to the comprehension of the truth about something, of any kind whatsoever, and in this sense can one even know contingent events which are neither probable nor improbable; (2) in its proper sense, it refers to the comprehension of the truth about something which occurs with a degree of frequency regarding both modes, and thus are we able to know contingent events that are prone to a certain regularity; (3) in a sense more proper still, one speaks of ‘knowing’ in relation to the comprehension of the truth about something which always behaves in the same way and is immutable, and this type of knowledge encompasses the principles as well as the conclusions; (4) in the most proper sense, however, it refers to the comprehension of the truth about something which always behaves in the same way, insofar as it is understood by means of something which is prior to it, and from which it derives its truth and being, as is the case with the conclusions in a demonstration”<sup>10</sup>.

Most evidently, Kilwardby takes up Aristotle’s *sensu stricto*-definition of knowledge or science in terms of knowledge of causes and necessity—the last in his enumeration—, while introducing, in advance of this, three *sensu lato*-concepts of knowledge. These are:

First, knowledge regarding “*contingentia ad utrumlibet*”, that is to say, contingent events, which are neither probable nor improbable, but are wholly indefinite<sup>11</sup>.

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10. D. CANNONE (ed.), *Le ‘Notule Libri Posteriorum’* cit., 31-32: “Praeterea sciendum, quod hoc ipsum ‘scire’ dicitur quadrupliciter: (1) communissimo autem modo dicitur comprehensio veritatis rei, qualiscumque sit res, et sic etiam sciuntur contingentia ad utrumlibet; (2) et proprie dicitur comprehensio veritatis rei, quae frequenter et utroque modo se habet, et sic sciuntur contingentia nata; (3) magis proprie autem dicitur ‘scire’ comprehensio veritatis rei, quae semper uno modo se habet et est immutabilis, et iste modus sciendi communis est principiis et conclusionibus; (4) maxime proprie dicitur comprehensio veritatis rei, quae semper uno modo se habet, per acceptionem alterius prioris, a quo habet suam veritatem et suum esse, et iste modus appropriatur conclusionibus in demonstratione”.

11. For a survey of the different types of contingency featuring in medieval discussions and their respective definitions, see A. MAIER, *Die Vorläufer Galileis im 14. Jahrhundert. Studien zur Naturphilosophie der Spätscholastik* (Ed. di Storia e Letteratura, Roma, 1949) 219-250.

Second, knowledge of “*contingentia nata*”, that is to say, events that will or tend to occur with certain regularity, and are therefore “*frequenter*”.

And, third, knowledge of what is immutable or necessary, and is therefore “*semper*”.

I cannot go into detail here as regards comparing this account with that of Grosseteste, which latter has been analyzed thoroughly in an article by Pietro B. Rossi<sup>12</sup>; suffice it to say, however, that there are certain differences in terminology, e.g. Kilwardby here prefers to speak of “*contingentia ad utrumlibet*” rather than of “*contingentia erratica*”, as Grosseteste does. But these do not appear to have any doctrinal implications<sup>13</sup>.

It is true that Grosseteste is more explicit in the corresponding passage from his *Commentary* about how these kinds of knowledge should be related to the different sciences. Thus, he mentions that the second type of knowledge concerns “*naturalia*”, i.e. is related to physics, whereas the third type of knowledge is said to be characteristic of mathematics.

But if we continue to read Kilwardby’s text, it becomes clear that, in fact, he had the very same correlation or classification as Grosseteste in mind. Thus, regarding the knowledge of “*contingentia nata*”, he states that they are susceptible of demonstration, that is to say, insofar as they occur with a certain regularity, and he goes on to identify them with the realm of nature and physics:

“The most powerful demonstration is a demonstration of things which exist always and which are necessary, as has been shown above; it can be extended, however, to those things which occur with a degree of frequency, even though they do not always exist, for which reason we say that contingent events

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12. P. B. ROSSI, *Robert Grosseteste and the Object of Scientific Knowledge*, in J. McEVOY (ed.), *Robert Grosseteste: New Perspectives on His Thought and Scholarship* (Brepols, Turnhout, 1996) 53-75.

13. In fact, Kilwardby, seemingly without distinction, will also use the term “*contingentia erratica*” at other points, cfr. *infra*, for instance, text corresponding to note 21.

prone to a certain regularity are demonstrable, something which occurs mainly in the natural sciences”<sup>14</sup>.

Likewise, with regard to the third kind of knowledge, namely that which concerns the immutable or the necessary, Kilwardby not only states that its objects are most suited to demonstration, but he also establishes a clear relation of this kind of knowledge and one of the theoretical sciences, namely mathematics, in contrast to physics: “In the most powerful demonstration, e.g. in mathematics, there are only necessary principles; in the natural sciences we sometimes find contingent events that are prone to a certain regularity”<sup>15</sup>.

Therefore, both physics and mathematics have their place in Kilwardby’s modal division of knowledge, as we might term it. As far as the third theoretical science, i.e. metaphysics, is concerned, one may guess that, for Kilwardby, this discipline is equivalent to his fourth kind of knowledge, implying, as it does, knowledge of the cause that confers truth and being —*veritas* and *esse*— to the object under consideration, as well as its necessity.

But what about the first kind of knowledge, the one which deals with “*contingentia ad utrumlibet*”? In fact, Kilwardby seems to be more critical with respect to this form of knowledge, denying that those “*contingentia*”, which he proceeds to call “*contingentia indefinita*”, can ever become objects of demonstration. Thus, following Aristotle he writes:

“As Aristotle states in the *Prior Analytics*, there can be no demonstration of contingent events, because they do not possess a means ordered thereto<sup>16</sup>; however, the things under consideration are infinite, stretching from being to non-being; hence there is no demonstration thereof; but since artificial and

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14. D. CANNONE (ed.), *Le 'Notule Libri Posteriorum'* cit., 294: “Demonstratio potissima semper est eorum, quae semper sunt et necessaria, sicut supra ostensum est; extendendo tamen est eorum, quae frequenter et non semper sunt, prout nos dicimus, quod contingentia nata esse demonstrabilia, quod accidit maxime in naturalibus”.

15. *Ibidem*, 304: “In demonstratione potissima, ut in mathematicis, principia tantum necessaria sunt; in naturalibus sunt quandoque contingentia nata”.

16. This refers to *Analytica posteriora* I, 13, where Aristotle states that there is no *epistêmê* and no *sylogismos apodeiktikos* concerning contingent events.

moral issues are of this kind, they cannot be susceptible of any demonstration”<sup>17</sup>.

As a consequence, ethics as well as the arts, i.e. the mechanical arts, are expressly excluded from the domain of demonstration, since this type of knowledge is related neither to causal or necessary nor to regular phenomena. This deliberate exclusion of ethics and the mechanical arts from demonstrative science, on the one hand, and their inclusion within the list of the four types of knowledge at the beginning of Kilwardby’s *Notulae*, on the other, gives rise, it is true, to a certain tension. However, Kilwardby does not appear to be greatly concerned about this, at least not in his *Notulae*.

### 3. OPINION AND SCIENCE IN THE *DE ORTU SCIENTARUM*

Turning to Kilwardby’s *De ortu scientiarum*, that is to say, a work written some ten years later, one can observe that he maintains many of his earlier positions regarding causality, contingency and their relation to knowledge. But it seems that what ten years earlier had appeared to him to be a half-filled glass, now appears to be half empty.

At first glance, if we take a look at the section on physics in the *De ortu scientiarum*, it seems to raise no obvious problems. Kilwardby does not question the epistemological status of the science of nature here; though he does go on to do so when he comes to discuss the matter of ethics, which, as we have seen, is problematic with regard to its epistemological status, namely insofar as it can be included within a certain kind of *scientia* or *scire*, while it is excluded from demonstrative science.

Now, in his chapter on ethics, Kilwardby brings about a rapprochement between ethics and physics by saying that:

“And just as we have already shown that the practical disciplines are not based on necessary things, likewise must it be said that

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17. D. CANNONE (ed.), *Le ‘Notule Libri Posteriorum’* cit., 416: “Ut dicit Aristoteles in *Prioribus*, de contingentibus non fiunt demonstrationes, quia in illis non est medium ordinatum, sed ea, quae sunt a proposito, sunt infinita, de esse scilicet et non esse; ergo de hiis non demonstratur; quare, cum artificialia et moralia sint huiusmodi, de ipsis non erit demonstratio”.

physics does not always conclude from necessary principles either, nor even from a partial necessity alone [...] as a result of which there is a high degree of diversity in terms of opinion concerning natural philosophy. Often conclusions are based on probable principles, which in truth are false”<sup>18</sup>.

Indeed, physics, like ethics, does not always conclude from necessary causal relations, but also from what is contingent. This is totally consonant with Kilwardby’s account in the *Notulae*. However, the attentive reader will detect another argument concealed in this passage, for, when speaking of the “*diversitas opinionum circa naturalia*”, Kilwardby is, actually, alluding to Ptolemy, who in his *Almagest* had put forward serious doubts as to whether to call physics (alongside theology) a science at all, adding that there could hardly ever be agreement about the different opinions philosophers held about nature. For Ptolemy, physics was guesswork (*eikasia*), it was purely conjectural, hence the diversity of opinions<sup>19</sup>.

Of course, the passage quoted merely alludes to this discussion. However, Kilwardby does go on to state the matter in more explicit terms:

“The contingent events which fall within the scope of the practical arts are infinite and therefore erratic, since, in most cases,

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18. R. KILWARDBY, *De ortu scientiarum* cit., 136-137: “Et sicut iam ostensum est, quod practicae non sunt ex necessariis, similiter dicendum, quod physica non semper ex necessariis concludit, neque ex necessitate alteram partem conclusionis tantum, [...] quod testatur tanta diversitas opinionum circa naturalia. Multotiens etiam concludit per probabilia, quae in veritate sunt falsa”.

19. Cfr. G. J. TOOMER (ed.), *Ptolemy’s ‘Almagest’* (Princeton University Press, Princeton, 1998) I, 1, 36: “From all this we concluded: that the first two divisions of theoretical philosophy should rather be called guesswork than knowledge, theology because of its completely invisible and ungraspable nature; physics because of the unstable and unclear nature of matter; hence there is no hope that philosophers will ever be agreed about them”. A more detailed discussion of this passage can be found in Albert the Great’s *Physica* I, 1, 2: “Ptolemaeus propter ultimam rationem dicit de naturis non haberi scientiam certam propter sui mutabilitatem. Sed potius esse opinionem de ipsis, cuius signum esse dicit, quia plurimi in naturis diversa opinati sunt”. *Alberti Magni Ordinis Fratrum Praedicatorum Physica*. Edidit Paulus Hossfeld (Aschendorff, Münster, 1987) 4. However, in what follows, Albert clearly rejects Ptolemy’s view.



they derive from human intentions and deliberation. Yet sometimes it is a matter of contingent events that are prone to a certain regularity, as occurs in the conjectural arts, such as medicine and navigation, as we have previously stated. Ethics, therefore, and the mechanical arts do not provide any certain knowledge about the things which are their concern, nor does physics always do so<sup>20</sup>, although in most cases it does, but they provide rather opinion and conjectural knowledge<sup>21</sup>.

Taking once again as his starting point the precarious epistemological status of ethics (and the mechanical arts), Kilwardby is led to a problematization of the epistemological status of physics as well. Thus, not only do ethics and the mechanical arts not belong to true science, *certa scientia*, but also physics is said to belong, at least partly, to the domain of opinion and conjecture, as do they.

It is clear that, with regard to the *Notulae*, Kilwardby has arrived here at a turning point, for while in his rather optimistic half-filled-glass account of the *Notulae* ethics and physics were, in a broad sense, parts of knowledge, now, in his more critical half-empty-glass account, both are related to the epistemic concept of opinion rather than science.

It goes without saying that a half-filled glass is the same as a half-empty one, but what is the case with science and opinion? In other words, are ethics and, more importantly, physics, when conceived as a certain form of opinion, the same as when they are conceived as a certain form of scientific knowledge?

Apparently Kilwardby himself did not feel all that comfortable with this rapprochement of ethics and physics, for it clearly weakens

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20. Two out of the twenty manuscripts used by A. G. JUDY for his edition omit "*physica*". One may guess that the scribes did not feel at ease with the relegation of physics to the domain of opinion and conjecture, and therefore decided to elide the reference to physics.

21. R. KILWARDBY, *De ortu scientiarum* cit., 137: "Contingentia autem, quae cadunt in consideratione artium practicarum, sunt infinita et ideo erratica, eo quod ab humano proposito et consilio proveniunt—dico ut multum. Aliquando tamen [contingentia] sunt nata sicut accidunt in coniecturalibus artibus, ut in medicina et navigatione, ut praedictum est. Et ideo ethica et mechanica non faciunt certam scientiam eorum, quae ostendunt, sed nec physica in omnibus, licet in multis, sed magis faciunt opinionem et coniecturalem cognitionem".

the epistemological status of physics. Therefore, he hastens to indicate some important differences between ethics and physics.

In the first place, he reminds us that the contingency of the objects of physics differs from that of ethics in the following manner:

“It should be known, however, that while physics very often deals with contingent events, as do the practical arts, they both do so in different ways. The contingent events which fall within the scope of physics are contingents prone to a certain regularity, and which frequently behave in a similar manner”<sup>22</sup>.

To a great extent, this is in line with his explanations from the *Notulae*, where the regularity of the objects of physics was said to guarantee their demonstrability.

More interesting than this, however, is a second thread of argument which he develops immediately after this, and which distinguishes the different types of contingency in ethics and physics not according to their probability, i.e. whether they show a certain regularity or not, but according to their universality, which is defined in terms of their distance from the sensible world:

“Furthermore, the contingent events considered by physics are more remote from the senses and more universal than those which are considered by the practical arts. The reason for this is that while the former persists in pure speculation, the latter reaches down into the realm of operations which are in single sensible things or are concerned with them. Physics, therefore, is more akin to the definition of philosophy and of true science than that part of philosophy which is called practical”<sup>23</sup>.

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22. *Ibidem*: “Verumtamen sciendum, quod cum physica plerumque sit de contingentibus et practicae de contingentibus, dissimiliter tamen. Contingentia enim, quae cadunt in consideratione physica, sunt contingentia nata, quae ut frequentius se habent uno modo”.

23. *Ibidem*: “Item contingentia, de quibus considerat physica, sunt magis remota a sensu et magis universalialia quam illa, quae considerant practicae, et causa est, quia illa stat in sola speculatione, et istae descendunt ad operationes, quae sunt in sensibilibus singularibus et circa illa. Et ita plus habet physica de ratione philosophiae et verae scientiae quam pars philosophiae, quae dicitur practica”.

It seems that this second account of the distinction between different types of “*contingentia*” is meant to be a complementary one, which would explain why the “*contingentia*” involved in human action are “*ad utrumlibet*”, whereas those which feature in nature are “*frequenter*”. If this is true, Kilwardby’s basic account of contingency does not rely primarily on different probabilities, but rather on the relation of the phenomena under consideration to the sensible world and, ultimately, to matter. While the object considered by physics is distant from matter and more universal, and thus capable of demonstration, the object considered by ethics has an involvement with material conditions insofar as it is related to actions being put into practice. This is also, in my eyes, the key to understanding how opinion and science can eventually be brought together by Kilwardby, that is to say, how his half-empty-glass account can be harmonized with the half-filled one. To this end, a passage from the *Notulae* commenting upon Aristotle’s concept of opinion or *doxa* as expounded in *Analytica posteriora* I, 33, is most revealing. For here Kilwardby explains how opinion and science are related to each other by way of the object’s relation to matter. In this passage, Kilwardby distinguishes two types of opinion. The first has no connection with science at all:

“One mode of opinion—and this is how the word ‘opinion’ is mainly used—concerns the uncertain behavior of things capable of behaving otherwise. And in this sense it is clear that opinion and science cannot be the same nor pertain to the same thing”<sup>24</sup>.

The second type of opinion, however, is in a certain way identical with science:

“Another mode of opinion concerns our understanding of things which are actually necessary, even though they are not

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24. D. CANNONE (ed.), *Le ‘Notule Libri Posteriorum’* cit., 316: “Uno modo est opinio, secundum quod maxime usitatum est nomen opinionis, rerum quae possunt aliter se habere habitus incertus; et hoc modo manifestum est, quod non sunt idem opinio et scientia, nec etiam eiusdem”.

considered as being necessary, as may become clear from the following: There are things which are entirely separate from material conditions and mutable qualities, and our understanding them as such amounts to scientific knowledge or to a state of mind possessing certainty. Yet when someone understands such things by means of sensory images and combines them with mutable qualities, by which they are not actually accompanied, then this person opines, and his understanding is merely opinion, and he does not understand as necessary that which is indeed necessary, and therefore his understanding is false. [...] This, however, is the substantial difference between opinion and science; and from this it becomes clear that with regard to the very same terms and assertions both can be the case, since the diversity of the subject matter, namely of the necessary or contingent terms and assertions, does not introduce a diversity among that which constitutes the object of science and that which constitutes the object of opinion”<sup>25</sup>.

This passage clearly establishes a qualified identity between opinion and science, insofar as they are both directed at the very same object, namely those things or states of affairs which are free from matter and changeable conditions and are thus necessary. Yet, while scientific knowledge has access to these things as such, opinion can attain

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25. *Ibidem*: “Alio modo est opinio acceptio eorum, quae in veritate sunt necessaria, non tamen ut necessaria, quod patet sic: sunt res, quae penitus sunt absolute a conditionibus materialibus et dispositionibus transmutabilibus, quarum acceptio et ut talium scientia est vel certior habitus; sed si aliquis accipiat illas res sub fantasmatibus et concernat ipsas cum dispositionibus transmutabilibus, cum quibus non sunt in sua veritate, iste opinans est, et ista acceptio est opinio, et accipitur non ut necessarium, quod in veritate est necessarium, et ideo mendax est accipiens. [...] Haec igitur est substantialis differentia scientiae et opinionis; et ex hoc patet, quod circa eosdem terminos et circa idem enuntiabile potest esse utraque, quia diversitas materiae, sicut terminorum vel enuntiabilium necessariorum vel contingentium, non diversificat scibile et opinabile”. Again, Kilwardby draws on Robert Grosseteste’s *Commentary*; this time, however, his account differs quite significantly from that of his predecessor. For he reduces Grosseteste’s threefold distinction to a binary one, eliding Grosseteste’s third definition of opinion as knowledge of contingent objects as such. Cfr. R. GROSSETESTE, *Commentarius in Posteriorum Analyticorum Libros* cit., 278-281.

them only in combination with their material and changeable conditions. As a result, the propositions of the former will be necessary, whereas those of the latter are contingent; but this does not mean that there is any difference between the objects upon which they depend for their truth, for these are the same.

If one takes this account of opinion and science, it seems that, strictly speaking, contingency is a problem of the knowing subject rather than of the knowable object, for, from a God's-eye view, namely from the perspective of one who perceives the causal relations as they are, in the absence of any material or mutable conditions, there will not be any contingency at all. One might mention, in passing, that this is quite in line with Article 93 of the 1277 Paris Condemnations according to which it is not the case "that with respect to the first cause anything can come about by chance, and that it is false that everything is preordained by the first cause, since this would imply that it occurred by necessity"<sup>26</sup>.

But Kilwardby does not go into this question; instead, he continues his argument, and derives from the qualified identity of opinion and science a form of equivalence between dialectic (or topical) propositions based on probable assumptions and demonstrative propositions founded on necessary causal relations:

"From this it follows that, if being probable and resting on opinion are the same thing, then being probable and being open to demonstration are not substantially different in terms of the diversity of their subject matter, and hence a dialectical proposition and a demonstrative one are identical in substance, and this is necessary"<sup>27</sup>.

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26. Cfr. R. HISSETTE (ed.), *Enquête sur les 219 articles condamnés à Paris le 7 mars 1277* (Publications Universitaires, Louvain, 1977) 160: "quod aliqua possunt casualiter evenire respectu causae primae; et quod falsum est, omnia esse praeordinata a causa prima, quia tunc evenirent de necessitate".

27. D. CANNONE (ed.), *Le 'Notule Libri Posteriorum'* cit., 316: "Et ex hoc sequitur, quod si idem est opinabile et probabile, tunc probabile et demonstrativum non differunt substantialiter per diversitatem materiae, et tunc eadem in substantia est propositio dialectica et demonstrativa, et hoc est necessarium".

In short, this is how the half-filled glass account coincides with the half-empty one: ethics and, in particular, physics, when conceived as opinion-based or dialectical forms of knowledge, are scientific knowledge insofar as opinion and science both depend on the very same object, which gradually proceeds from being the object of opinion and dialectical propositions to being the object of demonstrative science according to its relation to the sensible world and matter.

Against this background, it is possible to understand how, in keeping with his *Notulae*, Kilwardby can conclude at the end of his discussion of the epistemological status of ethics and physics in the *De ortu scientiarum*, that both are, in fact, in a certain manner, parts of the hierarchy of philosophy and of true science:

“True and certain science is found first and foremost in metaphysics and mathematics: in metaphysics principally because of the dignity of its subject matter, in mathematics principally because of the certainty of its mode of demonstration; only secondly and to a lesser degree in physics; thirdly and to an even lesser degree in ethics; and lastly and to the least degree in the mechanical arts, as is clear from what has been said”<sup>28</sup>.

#### 4. CONCLUSION

The preceding remarks can be summed up in the following way:

First, in his *Notulae*, even though Kilwardby lays down the foundations for his later discussion of the epistemological problem of causal necessity and contingency, he does not seem to be aware of or, at least, is not concerned about possible problems arising from his account.

Second, in the *De ortu scientiarum*, however, which takes as its starting point the precarious epistemological status of ethics and

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28. R. KILWARDBY, *De ortu scientiarum* cit., 137: “Prius enim et magis invenitur vera et certa scientia in metaphysica et mathematica, magis tamen in metaphysica pro dignitate subiecti, magis autem in mathematica pro certo modo demonstrandi; deinde minus et posterius in physica; tertio adhuc minus et posterius in ethica; ultimo autem et minime in mechanica, sicut patet ex dictis”.

Ptolemy's rather critical account of physics, Kilwardby tackles a central issue deriving from the opposition of necessary causal knowledge on the one hand and contingent knowledge on the other, namely the tension between science and opinion.

Third, Kilwardby's solution is based upon a novel account of contingency, which seems to operate in a more fundamental manner than the one which assesses different probabilities of contingent events. This novel account is embodied by his explanation of contingency in terms of matter-relatedness and the latter's negative consequences for our apprehension of the existing causal relations.

Fourth, this account allows him to place and to discuss the problem of contingency in a genuinely epistemological context, relating it to opinion and science, and showing that the problem of contingency is a problem of the knowing subject, rather than a metaphysical issue, since from a God's-eye view it would be possible to identify the determinant causal structures of reality.

Finally, Kilwardby's treatment of the epistemological problem of causal necessity and contingency finds its solution in an "*analogia philosophiae*"<sup>29</sup>, as he calls it, which is capable of reconciling strictly scientific knowledge with opinion-based or, rather, conjectural forms of knowledge, insofar as he states a qualified identity between opinion and science with regard to their object.

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29. *Ibidem*.