The *Glosa* as Instrument for the Development of Natural Philosophy: William of Conches' Commentary on Boethius[1]

Lodi Nauta

Introduction

The rise and development of natural philosophy in the early twelfth century is a fascinating event in medieval intellectual history. Not surprisingly, such a crucial period has been interpreted in many different ways by different scholars, but most would agree that this period witnessed the emergence of a rational approach to nature.[2] This approach is characterized by a search for first principles and elements out of which the cosmos was believed to be constructed, and which were conceived as still governing the natural processes. God's part in the creation of the cosmos was largely limited to having set the *machina mundi* in motion, and it was especially its unfolding according to God's rational plan that was of major concern to twelfth-century scholars. Their aim was to discover and describe this divine blueprint, to read the Book of Nature *secundum physicam*.[3]

In doing so they drew on a host of texts from their own native Latin tradition as well as on medical, astronomical and mathematical treatises,

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[1] Research for this article and for my work towards an edition of William of Conches' commentary on Boethius' *Consolatio* for *Corpus Christianorum* is funded by the *Netherlands Organization for Scientific Research* (NWO). A first draft of this article was conceived at the Warburg Institute (London) in the Spring of 1996, when I held a Frances A. Yates Research Fellowship, and I would like to thank members and staff of the Warburg and especially Dr Charles Burnett for having made my stay so pleasant and fruitful. I also thank my coeditor, Dr Maarten Hoenen, for his pertinent criticisms of a first draft of this and the following article.

[2] The bibliography is vast. Several aspects are dealt with in *A History of Twelfth-Century Western Philosophy*, ed. Peter Dronke, Cambridge 1988 (henceforth abbreviated as *HTWP*), and *Aufbruch, Wandel, Erneuerung. Beiträge zur `Renaissance' des 12. Jahrhunderts*, ed. G. Wieland, Stuttgart 1995; A. Speer, *Die entdeckte Natur. Untersuchungen zu Begründungsversuchen einer `scientia naturalis' im 12. Jahrhundert*, Leiden 1995 (Studien und Texte zur Geistesgeschichte des Mittelalters, 45) is a recent monograph on the subject and contains a full bibliography. Among the older literature see esp. M.-D. Chenu, *La théologie au douzième siècle*, Paris 1976 (1957[1]); R. W. Southern, *Medieval Humanism and Other Studies*, Oxford 1970; W. Wetherbee, *Platonism and Poetry in the Twelfth Century: The Literary Influence of the School of Chartres*, Princeton, New Jersey, 1972.

[3] This phrase occurs for example in Thierry of Chartres' *Tractatus de sex dierum operibus*, ed. N. M. Häring, *Commentaries on Boethius by Thierry of Chartres and His School*, Toronto 1971, *555*: "De septem diebus et sex operum distinctionibus primam Geneseos partem secundum phisicam et ad litteram ego expositurus (...)."

recently translated from Greek and Arabic. Parallel to the search for first principles or elements in nature, was a search – inspired by (among others) Boethius' theological treatises, Euclid's *Elements* and Aristotle's *Posterior Analytics* – for first principles, postulates, axioms or common notions, not only in mathematics (which had always been Aristotle's favourite example of a demonstrative science), but also in other branches of learning that lent themselves to a construction *more geometrico*, for example in theology.[4] Striking advances in the sciences of the quadrivium were achieved in astronomy due to the wider employment of the astrolabe, translations and adaptations of astronomical tables, and the development of the relevant mathematical equipment. Even so, natural science in the twelfth century remained a bookish affair, based as it was on texts, but the introduction of new texts from different traditions at least stimulated critical thinking and argumentation, as one had to choose between various alternative explanations of the same phenomena, or try to reconcile different points of view.

The form in which this learning was transmitted could be of several kinds. As to the old learning, much information was still retrieved from encyclopedic works such as Pliny's *Natural History*, Seneca's *Natural Questions*, Isidore's *Etymologies*, and Bede's *De natura rerum*. Much relevant material could also be found in a group of texts that were more or less widely studied and commented on in the cathedral schools of the tenth and eleventh centuries: Plato's *Timaeus*, Boethius' *Consolation of Philosophy* and his *On Arithmetic*, Macrobius' *Commentaries on the Dream of Scipio*, and Martianus Capella's *On the Marriage of Mercury and Philology*. Natural science could sometimes be developed to a rather advanced level in glosses on these texts, witness for example manuscripts on Martianus Capella.[5]

The new learning too could be encountered in texts of various kinds: translations of systematic treatises, collections of questions, commentaries, introductions to astronomical tables, and so forth. An important source was formed by collections of questions (sometimes accompanied with answers) on mainly medical and biological issues – known as the Salernitan Questions (named after

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[4] Cf. Charles Burnett, `Scientific Speculations', *HTWP*, 151-176; G. R. Evans, *Alan of Lille*, Cambridge 1983; M. Dreyer, *Nikolaus von Amiens: Ars fidei catholicae – Ein Beispiel axiomatischer Methode*, Münster 1993 (*Beiträge GPhThMA*, NF, 37); *ibid.*, `Regularmethode und Axiomatik. Wissenschaftliche Methodik im Horizont der artes-Tradition des 12. Jahrhunderts', *Scientia und ars im Hoch- und Spätmittelalter*, eds. I. Craemer-Ruegenberg and A. Speer, Berlin and New York 1994 (Miscellanea Mediaevalia 22/1-2), 145-157.

[5] On these MSS (containing astronomical diagrams for planetary phenomena), see Bruce Eastwood, `Plinian astronomical diagrams in the early Middle Ages', *Mathematics and its applications to science and natural philosophy in the Later Middle Ages*. ed. E. Grant and J. Murdoch, Cambridge 1987, 141-172; *ibid.*, `The Astronomies of Pliny, Martianus Capella and Isidore of Seville in the Carolingian World', *Science in Western and Eastern Civilization in Carolingian Times*, ed. P. L. Butzer and D. Lohrmann, Basel 1993, 161-180.

Salerno, the centre of the famous medical school) that began to percolate through the West at this time.[6] Related to this Salernitan material is a group of medical texts known as the *Articella*, which was put together at the end of the eleventh century and used as introductory courses in medicine. Commentaries on these texts are known from the beginning of the twelfth century.[7]

The appropriation of new and traditional sources as well as the employment of different genres in which natural philosophy could be developed are well illustrated by the work of William of Conches (born about 1080), who is widely regarded as one of the foremost natural philosophers of the first half of the twelfth century.[8] His literary output includes commentaries on school authors such as Boethius, Macrobius, Plato, Priscian and possibly Martianus Capella, Virgil, and Juvenal, a systematic treatise on natural philosophy, *De Philosophia* (about 1120/25), and a strongly revised version of this work in the form of a dialogue, entitled *Dragmaticon* (about 1144/49). Such traditional learning as derived from the encyclopedic tradition and glossed school texts, went hand in hand with the new learning which William had already begun to explore in his early *Philosophia*, and upon which he drew more extensively in the *Dragmaticon*.

William's maturation as natural philosopher is thus illustrative for trends within early twelfth-century natural philosophy in general. Between the composition of his first work, the Boethius commentary, and the *Dragmaticon*, lie only a 25-odd years, but these were vital years for the development of the natural philosophy witness the growing confidence with which William and some of his contemporaries made use of the new learning, thereby contributing to its dissemination. Oddly enough, only a few scholars seem to have realized that William's natural philosophy must not be studied solely on the basis of the *Philosophia*. Tulio Gregory was the first who recognized interesting differences, amidst a great number of similarities in thought and style, between the

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[6] On this material see B. Lawn, *I quesiti salernitani*, Salerno 1969 (revised edition of *The Salernitan Questions. An Introduction to the History of Medieval and Renaissance Problem Literature*, Oxford 1963); *ibid.*, *The Prose Salernitan Questions*, London 1979 (Auctores britannici medii aevi, 5).

[7] See Lawn, *The Prose Salernitan Questions*, 2-16; D. Jacquart, `Aristotelian Thought in Salerno', *HTWP*, 407-428 (with further bibliography).

[8] The best studies of William's natural philosophy are T. Gregory, *Anima mundi. La filosofia di Guglielmo di Conches e la Scuola di Chartres*, Florence 1955, and esp. D. Elford's unpublished dissertation, *Developments in the Natural Philosophy of William of Conches: A Study of the `Dragmaticon' and a Consideration of its Relationship to the `Philosophia'*, Cambridge 1983 (with critical discussion of older literature); I am grateful to her for having made available her thesis to me; cf. her `William of Conches' in *HTWP*, 308-327, and Speer, *Die entdeckte Natur*, 130-221. Still useful are H. Flatten, *Die Philosophie des Wilhelms von Conches*, Koblenz 1929 and J. M. Parent, *La doctrine de la création dans l'École de Chartres*, Paris-Ottowa 1938, 122-136.

Philosophia and the *Dragmaticon*, thereby showing that the latter was not merely a redaction of the earlier *Philosophia*. These developments in William's later natural philosophy have recently been explored in more detail,[9] although it is still possible to find claims to the effect that William `never substantially added to or improved [the *Philosophia*]'.[10]

What remains to be studied is the *early* development of William's natural philosophy up to its first mature expression in the *Philosophia*. For this we must turn to the Boethius commentary in which long explanations of natural phenomena are incorporated. In what follows I shall suggest that already in the Boethius commentary William could draw on material that later found its way into the *Philosophia*. This fact in itself is not surprising given William's practice of copying whole blocks of text from one work to another, but the presence of these detours on natural philosophy in a work which was primarily devoted to the exposition of the *Consolatio Philosophiae*, may tell us something about the extent to which a commentary could function as a vehicle for exploring natural philosophical issues.

This may also explain why scholars have focused their attention mainly to the *Philosophia* (sometimes in combination with William's commentary on Plato's *Timaeus* and his *Dragmaticon*) for bringing out the significant features of William's philosophy. The development of twelfth-century natural philosophy is usually associated with independent, systematic treatises such as Thierry of Chartres' *De sex dierum operibus* (although formally a commentary on the opening of *Genesis*), William's own *Philosophia* and the *Dragmaticon*, Adelard of Bath's *Quaestiones Naturales* and *De eodem et diverso*, Hermann of Carinthia's *De essentiis*. Although most scholars have no wish to deny the significant role of glosses and commentaries in the development of learning, it has not been for long that, for example, systematic study is made of commentaries on the group of medical texts, known as the *Articella*, and that editions appear of commentaries, for example, on Martianus Capella, Virgil and Plato, in which natural philosophical issues are addressed.[11] A second

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[9] Gregory, *Anima mundi*, 223-231; Elford, *Developments in the Natural Philosophy*, *passim*; I. Ronca, `The Influence of the *Pantegni* on William of Conches' *Dragmaticon*', *Constantine the African and Ab_ ibn al-`Abb_s al-Ma__s_. The Pantegni and related Texts*, ed. Ch. Burnett and D. Jacquart, Leiden 1994 (Studies in ancient medicine, 10), 266-285.

[10] R. W. Southern, *Scholastic Thought and the Unification of Europe. Vol. 1. Foundations*, Oxford 1995, 82. Cf. also T. Boiadjiev, `Die Naturwissenschaft als Metaphysik der Natur bei Wilhelm von Conches', *Scientia und ars im Hoch- und Spätmittelalter*, eds. I. Craemer-Ruegenberg and A. Speer, 369-380, whose inadequate discussion conflates the two works.

[11] For example, *The Commentary on the First Six Books of the `Aeneid' Commonly Attributed to Bernard Silvestris*, ed. J. W. Jones and E. F. Jones, Lincoln, Nebraska, 1977; *The Commentary on Martianus Capella's De nuptiis Philologiae et Mercurii attributed to Bernard Silvestris*, ed. H. J. Westra, Toronto 1986 (Ponticial Institute of Mediaeval Studies, Studies and

objective of this article therefore is to look more closely at the genre employed by William: the *glosa*. The first and primary function of a commentary was of course to explain and elucidate the text that was being read. But a second function, that of drawing on current debates for developing one's own theories, became increasingly more important by the end of eleventh century and, as we will see below, was already exploited by William in his first work.

Another reason for this neglect of the Boethius commentary must be sought in the absence of an integral edition. While the *Philosophia* has been readily accessible, his earlier works – the commentaries on Boethius and on Macrobius – have not been edited so far, and it is only recently that an *Opera Omnia* edition has been planned.[12] William's own practice of repeatedly revising his works has not made it easier for scholars to see clear lines along which his philosophy was developed. Many of his works exist in more than one redaction. Even the term `redaction' may already suggest too much unity where in fact manuscripts differ in small but sometimes significant aspects, each manuscript being rather a version of its own.[13] Concomitant to this is the problem of authenticity of the interpolations, additions and other alterations in the manuscripts. Can they be ascribed to William himself or to later copists or both? This fluidity and complexity of the manuscript tradition may have put scholars off from editing these commentaries, with the consequence that they do not play any role in treatments of William's natural philosophy.

In concentrating on the natural philosophy in William's Boethius commentary and the way in which the *glosa* was instrumental for its presentation and development, I shall have nothing to say on topics such as William's employment of the concept of *integumentum* (`veil', `covering') in his exposition of mythological lore and Platonic philosophy, and his handling of Platonic notions such as the World Soul, the preexistence of the soul, and knowledge as anamnèsis. These issues represent indeed crucial and representative aspects of William's philosophical outlook, but they have figured more prominently in the literature on William's Boethius commentary, and have

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Texts, 80); *The Berlin Commentary on Martianus Capella's `De Nuptiis Philologiae et Mercurii Book 1*, ed. H. J. Westra with the assistance of C. Vester, Leiden 1994 (Mittellateinische Studien und Texte, 20); *Bernard of Chartres. The Glosae super Platonem*, ed. P. E. Dutton, Toronto 1991 (Pontifical Institute of Mediaeval Studies, Studies and Texts, 107).

[12] This edition, under the general editorship of E. Jeauneau, will appear in *Corpus Christianorum Continuatio Mediaevalis* (Turnhout). I. Ronca's edition of the *Dragmaticon* is in print (at the time of writing this); my edition of the Boethius commentary is scheduled for 1999. Other editions are due later.

[13] Cf. e.g. Dronke, `Thierry of Chartres', *HTWP*, 358-385, on 364 (on versions of Thierry's works); Christopher Baswell, *Virgil in Medieval England. Figuring the* Aeneid *from the twelfth century to Chaucer*, Cambridge 1995, (Cambridge Studies in Medieval Literature, 24), 64 (on Virgil MSS).

been discussed elsewhere.[14]

The `glosa'

i. commentum/glosa

When William of Conches started his teaching career at about 1120, his choice to read and comment on Boethius' *Consolatio* was not a surprising one.[15] A commentary tradition had already existed from the time that Alcuin of York had legimitized the reading of the *Consolatio* by setting it within a Christian framework (late eighth century). The most influential glossator before William was Remigius of Auxerre, whose work (about 900) was in fact so popular that it went through several redactions and was mixed with other sets of glosses in the later tenth and eleventh centuries, leaving future editors in bewilderment.[16] These Remigian commentaries consisted of concatenations of marginal and interlinear glosses, and were drawn from several different sources. Most of the glosses focused on grammatical, lexical and other linguistic phenomena, or elucidated Boethius' references to mythological and historical events. A glossator could occasionally devote more extensive glosses to philosophical themes, in particular to the Neoplatonic treatment of the World Soul and human souls in the famous hymn, `O qui perpetua' (III metre 9). Some authors, most notably Bovo of Corvey and Adalbold of Utrecht (about 1000), wrote even exclusively on this metre, and their glosses take on the appearance of a running exposition of Boethius' Platonic philosophy.

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[14] For a recent discussion (with further bibliography) see A. J. Minnis and L. Nauta, `*More Platonico loquitur*: What Nicholas Trevet really did to William of Conches', *Chaucer's "Boece" and the Medieval Tradition of Boethius*, ed. A. J. Minnis, Cambridge 1993 (Chaucer Studies, 18), 1-33 (with appendices by Nauta in *ibid.*, 189-196). E. Jeauneau, `L'usage de la notion d'*integumentum* à travers les glosses de Guillaume de Conches', *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 24 (1957), 35-100 (repr. in *ibid.*, *"Lectio philosophorum". Recherches sur l'École de Chartres*, Amsterdam 1973) and Peter Dronke, *Fabula. Explorations into the Uses of Myth in Medieval Platonism*, Leiden 1974 (Mittellateinische Studien und Texte, 9), 1-78, remain fundamental.

[15] The start of William's career has been variously put between 1115 and 1130. Most scholars tend to put it at about 1120-5 in view of William's own statement in the *Dragmaticon* (to be dated between 1144-49 or more probably 1146-49) that he had taught in the schools for "twenty years and more" (ed. Gratarolus 1567, 210).

[16] On the Remigian commentaries, see P. Courcelle, *La Consolation de Philosophie dans la tradition littéraire. Antécédents et postérité de Boèce*, Paris 1967, 241-299, to be read in conjuntion with: D. K. Bolton, `Remigian Commentaries on the *Consolation of Philosophy* and their Sources', *Traditio* 33 (1978), 381-394 and *ibid.*, `The Study of the *Consolation of Philosophy* in Anglo-Saxon England', *AHDLMA* 44 (1977), 33-78; J. Wittig, `King's Alfred's "Boethius" and its Latin Sources', *Anglo-Saxon England* 11 (1983), 157-198. The last two scholars were intending to edit the Remigian glosses, but understandably considered the task impracticable.

This is not to place to review the attitudes of these earlier readers; they varied from an enthousiastic endorsement of Boethius' Platonism to a rejection of it, but most tried to take the sting out of it by christianizing Boethius' allegedly heterodox views.[17] What is important here is that the early-twelfth century *glosa* as it was developed William of Conches and his master Bernard of Chartres, combined the best of both worlds and held middle between an exclusive attention to individual words and phrases, that is the *littera*, and an exclusive attention to the deeper meaning, that is the *sententia* of the text. As is well-known, it was William himself who was instrumental in disseminating these distinctions between *commentatores* (paying solely attention to the *sententia*) and *glosatores* (focusing primarily on individual words), and between *commentum* and *glosa*. In his Plato commentary, for instance, he writes that `nowadays we call *commentum* only an exposition of another text. It therefore differs from the *glosa*; for *commentum* deals only with the *sententia* but says nothing about the continuation (*continuatio*) or the exposition of the *littera*. The *glosa*, however, deals with all these factors'.[18] William clearly favours this last type of commentary which enables him to pay attention to individual words, the overall argument (or sequence of thought) as well as the deeper meaning of the text.

This new type of glossing, the *glosa*, also required a new type of format. The commentary was not written along the margins anymore or between the lines, but as a separate work that had to be used alongside a copy of the text glossed. (In later manuscripts the commentary could of course be used for furnishing glosses to be written in the margins again.) The majority of manuscripts of William's commentary on Boethius, for example, are of this form, that is without the text of the *Consolatio*, and the same is true for the manuscript tradition of Bernard of Chartres' glosses on Plato's *Timaeus*.[19] This

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[17] See Courcelle, *La Consolation*, 290-299; J. Marenbon, *Early Medieval Philosophy (480-1150). An Introduction*, London 1988 (revised edition), 85-87. For a history of these Platonic notions, see my `The Preexistence of the Soul in Medieval Thought', *Recherches de Théologie ancienne et médiévale* 63 (1996), 93-135.

[18] See *Glosae super Platonem*, ed. E. Jeauneau, Paris 1967 (Textes philosophiques du moyen âge, 13), 67, and the passages cited in Jeauneau, `Gloses et commentaires de textes philosophiques (IX^{e}-XII^{e} s.)', *Les genres littéraires dans les sources théologiques et philosophiques médiévales: definition, critique et exploration: Actes du Colloque international de Louvain-la-Neuve, 25-27 mai 1981*, Louvain-la-Neuve, 1982, 117-131. Cf. P. E. Dutton's introduction to his edition of Bernard of Chartres, *Glosae super Platonem*, 45-49; see also N. M. Häring, `Commentary and Hermeneutics', *Renaissance and Renewal in the Twelfth Century*, ed. R. L. Benson and G. Constable, Cambridge, Mass. 1982, 173-200, esp. 174-180 on the hardly fixed terminology employed by twelfth-century masters for denoting the genre of commentaries.

[19] See the edition of Dutton, *Glosae super Platonem*, 49-50. Cf. also C. H. Kneepkens, `The Priscian Tradition', *Sprachtheorien in Spätantike und Mittelalter*, ed. Sten Ebbesen, Tübingen 1995 (Geschichte der Sprachtheorie, 3), 239-264, on 242, and Baswell, *Virgil in*

format seems to have been popular particularly in the twelfth century. A thirteenth-century revision of William's commentary – extant in at least seven manuscripts – exploys a different format, one that became standard for several types of texts in the later Middle Ages: the commentary, which had to be revised in the light of the new learning and augmented to suit the new format, is now being divided into sections, each section followed by the relevant portion of the commentary.[20]

ii. Characteristics of the glosa

Since *glosae* often circulated as independent works (at least in twelfth-century manuscripts), separate from the text glossed, an organizing principle was required that would give them structure and coherence. This was achieved by structuring each part of the *glosa* in more or less the same way, starting with a general introduction and ending with an exposition of individual words. We know from John of Salisbury, a former pupil of William of Conches, that William and Richard "the Bishop" had modelled their teaching (*ad formam*) on the educational methods of Bernard of Chartres.[21] When comparing Bernard's Plato commentary (dated at 1100-15) and William's Boethius commentary, which is the closest in date of William's works to Bernard's work, we begin to appreciate John of Salisbury's phrase `ad formam': William's debt to his master concerns clearly the structure and style rather than the substance of his teachings.[22]

Both commentaries belong to the lemmatic type, since lemmata from the text glossed are the constituent elements. In both the glossing moves from the general level to the specific. A typical passage begins with a lemma to mark the beginning of a section, sometimes introducing a survey of the main issues at stake. The commentator then focuses on the `continuity' of the passage, that is its relationship with the previous and next sections. Such formula's as

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Medieval England, 86-91 and 102. Many more texts could be adduced to illustrate this change in structure and function of the commentary from the ninth till the twelfth century.

[20] On this revision see Minnis and Nauta, `*More Platonico loquitur*', and my Appendix I to that article in which it is shown that this is a thirteenth-century revision. The change in format from a twelfth-century *glosa* to a *divisio textus* may be illustrated by other texts as well, for example Gilbert of Poitier's commentaries on Boethius' *Opuscula Sacra* (personal communication by the late M. T. Gibson).

[21] *Metalogicon* I.24, ed. J. B. Hall, Turnhout 1991 (CCCM, 98), 54.

[22] According to Dutton, *Bernard of Chartres*, 48-49 and 54, Bernard's commentary on Plato must be dated between 1100-1115. Apart from a common phrase or two, I have not found striking similarities between the two works. For the following I am indebted to Jeauneau, `Gloses et commentaires' and Dutton's introduction to his edition, esp. 45-56, where Bernard's method is analysed.

Continuatio, *Vel sic continua*, *Vel sic*, *Quod uero sic incipit* and *Et hoc est quod sequitur* mark this second stage. They are also used to pick up the argument after a digression. The third and last stage is the explanation of individual words, and is often introduced by formula's such as *Et hoc est* or *Et hoc est quod ait*. William and Bernard pass over the second step frequently and use the phrase *Et hoc est* for rounding off the section before moving on to the next one.[23]

Other technical phrases that are employed by both Bernard and William are *Vel sic* or *Vel aliter* when an alternative interpretation is given; *Quasi diceret* when a faithful paraphrase of the text is given or the implicit meaning of the author is made explicit; and *Bene dicit* in order to state agreement with the *auctoritas*. Another important feature of their commentaries is the incipient *Quaestio* form of disputation, which seems to link the *glosa* to the classroom of the twelfth-century cathedral school. Such phrases as *Ne quis uellet*, *Si quis quaerat*, *Obicitur* and *Respondeo* occur frequently, and may suggest a lively contact between the master and his pupils. It is thus that Dutton, following Jeauneau's statement that `la glose est, en principe, l'écho de l'enseignement vivant', has claimed: `Bernard in his classroom at Chartres may stand close to the beginning of a tradition of the scholastic question-and-answer method that was to figure so prominently in the universities of the next century'.[24] Dutton further claims that Bernard must be credited with the development of this `Chartrian conception of the *glosa*', and that one of the first and formative uses of this comprehensive and systematical *glosa* can be found in Bernard's work.

iii. Some criticisms

Although it is certainly true that the lemmatic commentary turned out to be a suitable tool for providing a sustained and well-organized reading of a text, I would like to enter some caveats against this perhaps too rosy depiction of the *glosa* as a `new and richer Chartrian conception', and as a principal vehicle for the `emergence of an incipient *Quaestio* form of disputation'.[25]

First, debate and conflict, accompanied by their fitting terminology, had always been a characteristic feature of the schools long before the twelfth century. We are much less informed about this period than about the twelfth century, but one need only to think about the vexed debates, fought out in the early medieval monastic and cathedral schools, for example, on Boethius' Neoplatonism, the nature of the soul, universals, the philosophy of Eriugena,

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[23] Cf. Dutton, *Bernard of Chartres*, 54.

[24] Dutton, *Bernard of Chartres*, 55; Jeauneau, `Gloses et commentaires', 128, who had already drawn attention to these expressions which "introduisent, sous forme embryonnaire, la *Quaestio*, genre destiné, comme on sait, à une grande fortune" (p. 123).

[25] Dutton, *Bernard of Chartres*, 48 and 54.

the nature of the Trinity, predestination, natural philosophical themes and so forth, to make one cautious in laying too much emphasis on one particular master or school as the initiator of an entire genre. To give just one example. A passage on the souls from a Macrobius commentary, dating from the late eleventh century, is almost entirely constructed around disputation terms: *Queritur... Obicitur... Quod soluit... Rursus opponitur... Solutio... Obicitur iterum (...).*[26]

Is the *glosa* indeed an `écho de l'enseignement'? An echo without doubt, but are we allowed, for example, to jump from the occurrance of phrases such as *Ne quis uellet*, *Si quis quaerat* and *Obicitur* to the conclusion that the *glosa* tells us something about the *lectio* or the actual teaching in the class, or about the rise of an incipient *Quaestio* form of disputation? We need to be cautious here. The works by Bernard and William seem to me to be polished products written for and addressed to *lectores* rather than *auditores*. In the prefaces to several of his commentaries, William is keen to emphasize his own role in the commentary traditions, and many of his polemical remarks are aimed at earlier and, less obviously, contemporary *authors* (that is commentators). Opinions that could be collected in abundant number from encyclopedic works and other sources, were often introduced with *quidam dicunt* and similar phrases, not necessarily implying any existing persons, and many of the objections raised have a studied form (*sed si aliquis diceretur*).[27] These and other features such as cross-references, the occurrance of the term *lector* rather than *auditor*, and William's distinction between *scribere* and *docere*[28] point to the *glosa* as instrument of convehing ideas by writing rather than by oral teaching. Although in origin it certainly belonged to the class, its composition seemed to have been

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[26] *Pseudo-Bede: De mundi celestis terrestrisque constitutione. A treatise on the universe and the soul*, ed. and transl. Ch. Burnett and others, London 1985 (Warburg Institute Surveys and Texts, 10), 76-78. On the *quaestio* in the twelfth century schools and earlier, see Beryl Smalley, *The Study of the Bible in the Middle Ages*, 72-73; E. Lesne, *Histoire de la propriété ecclésiastique en France. Vol. V: Les écoles de la fin du VIII siècle à la fin du XII*, Lille 1940, 630-633; G. Paré, A. Brunet, and P. Tremblay, *La Renaissance du XII siècle: les écoles et l'enseignement*, Paris 1933, 124-128.

[27] It should be noticed that these disputation terms often occur in the more philosophical parts, that is in the detours where it is more likely that the author's reading of several, different sources formed the basis of the discussion in the text rather than a discussion in the class; see e.g. in Bernard of Chartres' *Glosa super Platonem*, where four of the six instances occur in the *Tractatus de primordiali materia* (the last part of the glosses; 8.11-13; 8.264-65; 8.276; 8.295-305 in Dutton's ed.).

[28] *Philosophia* III § 1, ed. Maurach, 73: "Etsi studiis docendi occupati parum spatii ad scribendum habeamus (...)." If William's commentaries belong to the category of *scribere*, which I think is likely given his high view on the art of glossing, then teaching (*docere*) turns out to be something different from writing commentaries, with the implication that his commentaries are one or more steps removed from the actual teaching.

one or more steps removed from the actual teaching.[29]

Second, William's Boethius commentary often incorporates material from his predecessors (Remigius and his revisors), and like them he omitted a lot. Many phrases, even whole sections of the *Consolatio* are not glossed. The result is that in some places explanations kept their structure as separate glosses, which only differ from the (post-)Remigian ones by having been written in succession and not as marginal glosses alongside the authorial text.[30] In other words, there is often more continuity than meets the eye between earlier commentary traditions and the twelfth-century lemmatic commentary. Such `individual' glosses could alternate with digressions on natural philosophical and mythological subjects, thus giving the commentary not the impression of being a comprehensive, systematic and continuous *glosa*. That the commentary still has coherence and cohesion is due to William's unabated attention to the overall structure of the argument of the *Consolatio*, for which the *glosa* method was a suitable instrument, and here it was surely an improvement vis-à-vis the Remigian sets of glosses. Such phrases as `Ostenso..., modo ostendit...', `Hic est conclusio totius probationis', `Adhuc est probatio...' and their equivalents, often introduce summary accounts of sections which are further left unglossed.

Third, William used his commentaries not only for commenting on old texts but also for expounding, communicating and developing areas of knowledge that are only remotely relevant to an understanding of the immediate context of the argument. Most of these detours found their way into several of his commentaries, but they seem primarily to have been written for his systematic work in natural philosophy, as I shall suggest below. The *glosa* as a vehicle for exploring new theories and ideas was as important as limited, and it may be that William himself recognized its limits for this purpose.[31] Although much material that was carried from one work to another, was, so to speak, independent of the genre employed, in his last major natural philosophical work, the *Dragmaticon*, William chose to present his theories and ideas in the

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[29] Dutton, *Bernard of Chartres*, 56 sees a difference between the work of Bernard and those of William in the sense that the former is livelier and less polished, and still more reflecting the specific setting of the class. I cannot see much difference, however, despite William's lament, expressed in his Priscian glosses, of the breakdown of the relationship between master and pupils in his time (see Dutton, *ibid.*).

[30] This is especially true of his commentaries on the metres. The commentary on II m. 1 is a short gloss on the narrow strait Euripus; the commentary on II m. 2 consists of only two glosses (one on Hercules, inspired by the word `cornu' in line 6, and one on `frena' in line 15). These examples can be multiplied *ad infinitum*. More on this in my forthcoming edition of the commentary.

[31] Cf. Dutton, *Bernard of Chartres*, 48 and J. Cadden, `Science and Rhetoric in the Middle Ages: The Natural Philosophy of William of Conches', *Journal of the History of Ideas* 56 (1995), 1-24.

form of a dialogue, a choice that fitted with the introduction of question-literature whether of Salernitan origin or not, and which was better suited to explore (natural) philosophical problems than a commentary.[32]

One could even argue that William's work belongs to the last generation of commentaries that could still function as a vehicle for extending the body of (received) knowledge. As was already noticed, the twelfth century witnessed a rise of the number of more or less technical astronomical and mathematical treatises and translations, based on Arabic and Greek works, and closely related to the spread of astronomical tables and the astrolabe. Commentaries on texts such as Boethius' *Consolatio*, Plato's *Timaeus* or Macrobius' *In Somnium Scipionis* could no longer provide a forum for presenting and developing this new learning; there was a parting of the ways of (technical) quadrivial science and the more popular accounts, although the boundaries remained fluid for a long time.[33]

But also in other fields of learning, specialisation was accompanied by the emergence of new genres of texts and, consequently, with a loss of importance of the *glosa* in the form it had acquired in the early twelfth century. Here too, William, perhaps *malgré lui*, helped to transform the *glosae* into more specialized text books. His commentary on Priscian, for example, still belongs to the old tradition of the *glosulae* on that work, but the work of his pupil Petrus Helias, who was much indebted to William, bears clearly a `Janus face' looking backward to the old tradition and looking forward to the spread of specialised text books such as the *summa* that covered the main tenets of a discipline.[34]

Thus, while building on older traditions, Bernard of Chartres, William of Conches and some of their contemporaries went beyond these traditions by developing a way of reading and interpreting the ancient texts that tried to do justice to the educational demands that they as masters had to meet, but that enabled them to make significant contributions to the current philosophical discussions as well, thereby exploring the limits of a genre they had helped to develop. This dual function of the *glosa* is reflected by William's

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[32] Cf. Cadden, `Science and Rhetoric', 24.

[33] The twelfth-century master Petrus Alfonsi, for example, urged students in France to study the Arabic texts in their astronomical studies rather than an obsolete text as Macrobius' *In Somnium Scipionis*, because the first were considered to be superior; see his `Epistola ad peripateticos', edited in John Tolan, *Petrus Alfonsi and his Medieval Readers*, Florida 1993, appendix 1. The same sentiments were expressed by scholars as Adelard of Bath and Hermann of Carinthia, but the fluent boundaries between the two categories are well demonstrated by Hermann's *De Essentiis* in which the Platonic cosmology of the *Timaeus* was complemented by (technical) astronomical learning; cf. Charles Burnett, *Hermann of Carinthia. De Essentiis*, Leiden 1982 (Studien und Texte zur Geistesgeschichte des Mittelalters, 15), 25.

[34] Kneepkens, `The Priscian Tradition', 246.

reinterpretation of the famous metaphor of dwarfs sitting on the shoulders of giants. In his Priscian commentary, William writes on the one hand that he and his contemporaries are *relatores et expositores veterum, non inventores novorum*, but on the other hand that although the *veteri* were wiser, the *moderni* are able to see sharper (*perspicaciores*) since the last have a bird's eye view of the entire tradition that was being built on the foundations that the ancients had raised.[35] This subtle mix of self-confidence and reverence is, of course, a characteristic feature of the entire approach of William's generation towards the *auctoritates* and their profound texts.

The early development of William's natural philosophy: from the Boethius Commentary to the Philosophia

A consideration of the natural philosophy in William's Boethius commentary offers a perfect illustration of this dual function of the *Glosa*. In the *Consolatio* the natural order of the cosmos, while not a predominant ingredient of Boethius' return to his spiritual *patria*, is often alluded to by the author as a contrast to the confusion and ill-founded opinions, expressed by the *dramatis persona* that Boethius also is, about the allegedly immoral and random constitution of the human world. In order to clarify these allusions, William is happy to digress on topics such as the tides, the winds, thunder, comets, planets, and the stars, thereby showing his natural philosophical bent of mind that scholars have known primarily from his *Philosophia*.

It may be useful here to give a very brief general outline of William's natural philosophy, since we shall be considering some examples in more detail below. The developments in William's natural philosophy notwithstanding, it is generally characterized by his use of only a limited number of basic physical principles that must explain a wide variety of natural processes and phenomena in both the microcosmos (the human body) and the macrocosmos (the lower and higher regions of the cosmos). Of great importance are the minimal particles which occur in four varieties: dry and hot (predominant in fire), hot and moist (air), moist and cold (water), and cold and dry (earth). Due to these elementary qualities, the four visible elements are able to change into one another, and these changes are a recurrent theme in William's picture of a stable but dynamic cosmos. William saw these qualities (and other pairs of qualities, such as blunt/sharp, fine/corpulent and mobile/immobile) also at work

[35] See the text in Jeauneau, `Deux rédactions des gloses du Guillaume de Conches sur Priscien', *Recherches Théologie ancienne et médiévale* 27 (1960), 212-247; reprinted in *ibid*, *"Lectio Philosophorum"*, 335-370, on 358. Cf. by the same author in the same collection of articles: `Nani gigantum humeris insidentes. Essai d'interprétation de Bernard de Chartres', 53-73, on 58-59 where the passages from both redactions are cited. See also Speer, *Entdeckte Natur*, 76-81 with further bibliography on this theme.

in four basic forces (retentive, attractive, digestive and expulsive), which he had encountered in the *Pantegni*, a medical encyclopedia translated in the eleventh century by Constantine the African from an Arabic original.[36] He did not limit the working of these forces to physiological processes but also applied them to areas such as cosmology and meteorology, drawing parallels between phenomena from different levels of the natural world.[37] William's analogies were also inspired by processes observed in everyday experience, such as freezing, melting, frying, baking and perspiring. For example, the freezing of the ground in winter and its relaxation in spring were described in the same terms as the opening of the pores of the human body in warm conditions and their closure in cold conditions, and functioned as an explanatory mechanism for several different phenomena (why men have to eat more in winter than in summer; why well-water is colder in summer than in winter, why it is dangerous to make love after a copious dinner, why the roots of plants stay alive during the winter). We will consider some other examples below. Thus, by admitting only a few basic mechanisms and principles for explaining a wide variety of natural phenomena, William was able to breathe new life in old formulae and to refine the traditional and large-scale correspondences between elements, humours, ages and seasons by underlining the physical mechanisms (in terms of the elements, elemental qualities, forces) that these different domains had in common. Dijksterhuis' praise of William's natural philosophy is still valid: `there is much in the conceptions involved which later science will have to reject as insufficient, but nothing that need be rejected as fundamentally unphysical'.[38]

Although it is likely that William started to develop his natural philosophy independent from his commentary on Boethius, the incorporation of large blocks of texts in this work was not accidental nor served a purpose of mere dressing up his lecture notes. Our sense of relevance may be different, but to William a text such as the *Consolatio* embodied profound truths, which had to be clarified with the aid of all possible branches of learning. As he writes in his commentary on the Orpheus myth in Book III metre 12: `One should not believe that there is anything superfluous or of no account in such a perfect work as the *Consolatio* written by so perfect philosopher as Boethius is'; a

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[36] See the works cited in n. 9 *supra*.

[37] This was noticed by H. Liebeschütz, `Kosmologische Motive in der Bildungswelt der Frühscholastik', *Vorträge der Bibliothek Warburg 1923-4*, Leipzig 1926, 83-148, and in particular to Elford, *Developments of the Natural Philosophy*, *passim*, and her `William of Conches'. I have briefly commented on the use of analogies by William and Descartes in `De rol van analogie in de natuurfilosofie van Willem van Conches en Descartes', *Congresbundel Filosofiedag Groningen 1995*, ed. M. ter Hark *et al.*, Groningen/Delft 1995, 113-117.

[38] E. J. Dijksterhuis, *The Mechanisation of the World Picture*, Oxford 1961 (translated from the Dutch), 120.

variety of different interpretations of the same myth is to be greeted rather than spurned – and this seems to hold true for explanations of natural phenomena as well. In the prologue William writes that the *Consolatio* pertains to ethics,[39] but ethics itself was closely linked to the natural order because the *positiva iustitia* – laws, customs and rules by which human society is governed – should ideally be a reflection of the *naturalis iustitia*, that is the rational order that God had implanted into his creation and that man could discover through a study of the natural world.[40] This belief in the rational foundations of the cosmos and man's capacities to grasp and understand them, was fundamental to twelfth-century thinkers (it is of course a pervasive belief throughout history), and was forstered by the reading of such texts as Boethius' *Consolatio* and Plato's *Timaeus*.

It thus comes as no suprise to see William seizing the opportunity to use the Boethius commentary as a first forum for presenting his views on natural philosophical issues. Some of these passages found their way almost unaltered into the *Philosophia*, others underwent revision and augmentation to a more or less extent. A fuller or more mature exposition in the *Philosophia*, however, does not necessarily imply that William had actually developed his views on a particular subject. The Boethius commentary was a commentary after all, while in the *Philosophia* he could pay exclusive attention to natural philosophy. I have therefore divided the passages on natural philosophy from the Boethius commentary into three categories:

1) those which do not have corresponding passages in the *Philosophia*, in which case a comparison does not yield any conclusive evidence for a possible change of mind on William's part.

2) those which have been taken over in the *Philosophia* down to the level of phrasing and words, but are augmented with new sections. These additions need not necessarily reflect a more mature position. William could as well had abbreviated his text for inclusion in the Boethius commentary when he deemed a full treatment unnecessary and irrelevant.

3) those which are similar to the corresponding passages in the *Philosophia*, but now (unlike the passages in category 2) a comparison between the two works suggests that William has modified or developed his views.

By discussing some passages from group 3 in some detail below, I hope

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[39] "Ethicae supponitur quia de moribus sermo". I shall quote from MS Leipzig, Universitätsbibliothek, Cod. lat. 1253 (henceforth abbreviated as Leipzig 1253), which is the *manuscrit de base* of my forthcoming edition. Among other MSS that have been consulted in my edition are the following: Troyes, Bibl. mun. 1101; Troyes, Bibl. mun. 1381; Heiligenkreuz, Bibl. abbat. 130; Orléans, Bibl. mun. 274 (230) and Leiden, BPL 191A. Unless otherwise indicated, I shall not notice any variant readings from these or other MSS in this article.

[40] See William's *Glosae super Platonem*, ed. Jeauneau, 59-60: "Non uni tantum parti philosophie supponitur sed de pluribus aliquid in eo continetur"; Bernard of Chartres's *Glosae super Platonem*, ed. Dutton, 139-141 and elsewhere.

to show that even minor changes of style, presentation or argumentation may tell us something about the first phase of William's maturation of natural philosopher. First I shall give some examples of the first two categories.[41]

* Category 1

Old Age (I metre 1, lines 8-9)
Boethius' reference to two symptoms of old age, grey hair and loose skin (*Intempestivi funduntur vertice cani / et tremit effeto corpore laxa cutis*) in the opening song of the *Consolatio*, elicited a brief comment by William. Old age is characterized by coldness, he writes, due to the diminution of natural warmth (*calor*) in the human body. The dying of the roots of hair (which cause them to become grey) and the looseness of the skin (due to the dimimution of flesh and blood, which is warm and humid by nature) are two effects of this lack of warmth.[42]

These short explanations do not have a corresponding passage in the *Philosophia*. Old age is often referred to in Book 4 of the latter work but always in a more general context of the human physiology. The growth of hair and its different colours are mentioned, and the effect on memorizing capacities by the extinction of natural warmth in old age is held to be responsible for the diminishing of the faculty of memory[43], but there are no verbal similarities with the two short explanations in the Boethius commentary.

* Category 2

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[41] In order not to expand too much the length of this article, I shall only quote from the Latin when necessary, and paraphrase as much as possible. The *Philosophia* is quoted from the edition of G. Maurach, Pretoria 1980; the *Consolatio* from L. Bieler's edition (CCSL 94, Turnhout 1984). The translations are taken come from S. J. Tester in the Loeb edition prepared by H. F. Stewart and E. K. Rand, Cambridge, Mass. 1973.

[42] At least one MS, Troyes, Bibl. mun. lat. 1101, fol. fol. 1^{vb} has two interpolations here, which are possibly authentic ones: "Naturale enim est homini prius canescere in anteriori parte capitis ubi est cellula fantastica, sc. uis intelligendi. Et ideo merito dicuntur cani intempestiui, cum in uertice prius apparuissent". And: "Vel *tremit* ideo dicit [i.e. Boethius], quia senectus naturaliter frigida est, ex frigiditate constringit et contrahit humores. Quia ergo contracti et constricti sunt, sanguis non habet viam discurrendi per eos. Vnde quia fere expers sanguinis est, ex ponderositate pene uertitur in terream substantiam; sic eius ponderosa natura eius membra cogit descendere. Vita autem et spiritus que adhuc sunt in eadem membra, facit leuare et inde fit tremor". Cf. Lawn, *The Prose Salernitan Questions*, B 303 (posterior to William's work), and Adelard of Bath, *Quaestiones naturales*, ed. Martin Müller, 24-25 (BGPTMA 31/2), but there are no verbal similarities between William's passage in the Boethius commentary and these works.

[43] ed. Maurach, 105, 106 and 113-114.

Tides and winds (I metre 2, line 14)

In I metre 2 Boethius alludes to the winds that howl and stir up the waves of the sea (*flamina sollicitent aequora ponti*), and this occasions a long discussion on the winds and tides. After having said that the sea is located in the middle of the world, William explains that it produces two currents, one in the West (flowing South and North) and one in the East (similarly flowing South and North). He goes on to describe the origin of the tides in terms of the coming together of two currents. There follows a brief section on the origin of the winds, which mentions Eurus and Zephyrus: winds are generated by surges at the places where the currents collide.[44] William adds another explanation (winds entering and coming out of caves in the earth), he answers the question why we do not always feel the wind while there are tides daily which cause them, and in one sentence he deals with the saltiness of sea water that becomes less salty when filtrating through the earth.[45]

When we compare this section with the corresponding paragraphs in the *Philosophia*, it becomes clear that William has added more material in the latter work, and now explains in more detail the generation of the cardinal winds as well as the collateral winds. The differences, however, are not such that we can conclude that William had taken his views any further. He may simply have opted for a shortened account in the Boethius commentary of a longer section which was already available.

Eclipse of the moon (IV metre 5, lines 7-8)

The same is true for William's commentary on Boethius' references to the moon and her eclipses in Book I metre 5 and IV metre 5. The two passages from the Boethius commentary form together the section on the moon in the *Philosophia* where it is complemented with a section on the phases of the moon. In his commentary on IV metre 5 lines 7-8 (*Palleant plenae cornua lunae / Infecta metis noctis opacae*), William enumerates three figures of shadows (cilinder, cup/basket, and cone: *chilindroides, calathoides* and

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[44] "Cum ergo illae refluxiones, quae fiunt ab illo mari magno, exeunt et a se inuicem separantur, fit magnus motus. Sed una uice maior alia. Qui motus quando est maximus, facit uentum qui uocatur Eurus; eodem modo illae quae fiunt ab occidente, faciunt Zephirum. Cum autem in capite terrae incurrunt sibi refluxiones duae a parte septemtrionis, si maximus fit impetus, faciunt uentum qui uocatur Boreas; eodem modo ex alia parte duae aliae faciunt Austrum. Si uero illae refluxiones non in medio incurrunt sibi sed ultra, collaterales uenti fiunt" (Leipzig 1253, fol.).

[45] "Ita habemus qualiter ex refluxionibus maris uenti habeant esse. Ex cauernis terrae ita fit, quia aer labilis naturae est, subintrat cauernas terrae et exit. Cum autem una pars aeris intrat et alia exit, fit conflictus et mouetur aer et inde procreatur uentus. Vnde Eolia dicitur regio uentorum, quia cauernosa terra est" (Leipzig 1253, fol.). MS Troyes, Bibl. mun. 1101 fol. 4[va] adds "per characteres", which must be misreading for "per cataractas" (cf. *Philosophia* III § 34, ed. Maurach, 85).

conoides) and explains the moon's eclipse at full moon.[46] The other passage (on I metre 5) discusses briefly the moon's path vis-a-vis the sun, and why the moon does not shine herself.[47]

* Category 3

This is the most interesting category. Even small-scale revisions in style, terminology and argumentation (sometimes based on new sources) in otherwise identical passages, yield positive evidence that William had changed his mind on a number of issues. The examples suggest that William began to allot a greater role (even more than he had already done) to the elementary qualities in explaining natural processes. Due to the reading of medical texts recently translated — especially the writings of Constantine the African (*Pantegni*, *De oculis*) and Theophilus' *De Urinis* —, he could augment and revise his earlier views as presented in the Boethius commentary, and refine and embellish his style and terminology.

The brain (I prose 1, lines 2-3)
In his exposition of the appearance of Lady Philosophy above Boethius' head (*adstitisse mihi supra verticem visa est mulier*), William comes to speak about the three faculties of the brain, each located in one section. The *cellula phantastica*, containing the power of understanding, is located at the front; the *cellula logistica*, containing the power of discernment, is in the middle; and the *cellula memoralis* is at the rear, containing the power of memory. William follows Solinus in writing that this can be proved experimentally by injures of a part of the head: for example, someone who was injured at the rear, was not able to remember his own name but had retained the other mental faculties.

The same passage is found in the *Philosophia* book 4, but there the *cellulae* with their faculties are explained in terms of the elemental qualities:[48] for

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[46] "Omnis umbra quam de se emittit aliquod rotandum corpus aut chilindroides aut calathoides aut conoides est (...) Ergo umbra terrae ex sole in inferiori hemispherio currente uel chilindroides uel chalathoides uel conoides est. Chilindroides non est, quia terra non est aequalis soli, nec calathoides, quia non est maior sole. Et hoc sic potest probari. Si enim chilindroides uel calathoides esset, numquam stellae super terram uiderentur. Est igitur conoides. Cum ergo in plenilunio, ut diximus, sol et luna sunt disposita, tunc luna in cono umbrae existens deficit, et patitur eclipsim. Sed si in plenilunio ita disponantur ut alterum sit uersus aquilonem, alterum uersus austrum, tunc conus umbrae non dirigitur ad lunam nec tangit eam. Et ideo non patitur eclipsim. Et quare non est in omni" (Leipzig 1253, fol.). William's source is Calcidius; cf. *Timaeus a Calcidio translatus commentarioque instructus*, ch. XC, ed. J. H. Waszink, London and Leiden 1962 (Plato Latinus, 4), 141-142.

[47] *Philosophia* II §§ 68-70 (ed. Maurach, 66-67) corresponds roughly with the gloss on I m. 5 lines 5-9, and *Phil.* II §§ 73-77 (ed. Maurach, 66-72) with the gloss on IV m. 5 lines 7-8.

[48] IV §§ 37-38, ed. Maurach, 106-107.

instance, the *cellula phantastica* is warm and dry in order to attract the forms and colours of things (*formas rerum et colores attrahat*), and the *cellula memoralis* is dry and cold in order to retain well (*Ista est frigida et sicca, ut melius retineat*). Another noteworthy addition is Constantine's definition of the brain (*Cerebrum est liquida et alba substantia sine sanguine*), with which William was not yet familiar when he wrote the Boethius commentary.

The enfolding of the cosmos and the generation of life (III metre 9)

William's long and crucial exposition, known from the *Philosophia* book 1, of the enfolding of the *machina mundi* from its beginning in chaos (when the elements were not completely separated) to the creation of man out of warm mud, has for long been taken as the supreme example of a rationalistic and naturalistic approach towards nature, which is such a typical feature of thinkers such as William and some of his contemporaries (Thierry of Chartres and Adelard of Bath come to mind).[49] It has not always been realized that most of this section, imbued with Williams' characteristically self-confident and even aggressive tone, was already inserted in the Boethius commentary as part of William's commentary on III metre 9, that is Boethius' hymn on the creation of the cosmos, based on Plato's *Timaeus* 27C-42D. He takes stance against some *moderni diuini*: in explaining how the cosmos enfolded he does not go against Scripture where it is only stated *that* God created the world but not explained *how*, and neither does William distract anything from God's power in providing his creative act with a rationalistic interpretation; on the contrary, in showing how God's rational plan was put into practice, he rather confirms God's power.[50]

Without going into details, we may note the following `internal borrowings':

issue	*Philosophia*	*in Boetium*
coniunction of the elements	pp. 31-33	III m. 9:10 (numeris...ligas)
chaos and disposition of the elements	pp. 33-36	III m. 9:5 (fluitans materia)
creation of the stars	pp. 36-37	ibid.
creation of animal (incl. human) life	pp. 37-38	ibid.

[49] Esp. Gregory, *Anima mundi*; Burnett, `Scientific Speculations', *HTWP*, 151-176, and Dijksterhuis, *Mechanization of the World Picture*, 120. In his *Tractatus de sex dierum operibus*, Thierry of Chartres offers a similarly naturalistic account of the creation (*Commentaries on Boethius*, ed. Häring, §§ 5-28, pp. 557-567).

[50] "Sed cum moderni diuini hoc audiunt, quia in libris suis ita scriptum non inueniunt, obstrepunt statim, hoc ignorantes quod auctores diuinitatis philosophiam rerum tacuerunt, non quia contra fidem esset, sed quia ad aedificationem fidei de qua laborant non pertinet. Nec uolunt quod aliquid supra id quod scriptum est inquiramus, sed ut rustici simpliciter credamus. Et ita impletum est quod dixit Propheta: `Erit plebs sicut sacerdos" (Leipzig 1253, fol. on III m. 9). And: "At dicet aliquis: `Nonne hoc est opus creatoris quod homo ex hominibus nascatur?' Ad quod respondendum <est>: nichil per hoc deo detraho" (fol.). Cf. e.g. *Philosophia* I §§ 44-45, ed. Maurach, 39-40.

There are also some differences however. The creation of human life is treated more fully in the *Philosophia*, and includes William's controversial statement that the making of Eve out of Adam's side should not be taken literally but understood as meaning that she was created from the ground beside the spot where Adam originated – a statement which is still absent from the Boethius commentary. And the authority of Constantine the African, whom he quotes in the corresponding passage in the *Philosophia*, was not yet discovered by William when writing his first version of this section.[51]

`Cold moon' (I metre 2, line 9)

In Book I metre 2, Boethius refers to the cold moon (*gelida luna*), and this requires an explanation on the commentator's part, since planets are usually regarded as bright and mobile, which point to their being fiery and hot by nature. In the Boethius commentary, William gives the following explanation: The moon is said to be cold, not because it is cold by nature (*natura*), but from effect (*effectu*): it effects cold and moist on earth; just like wine is said to be warm, not because it is warm but because it causes heat when drunk. William then gives an alternative explanation which seems to contradict the solution just given: the moon is cold because of its slowness, since coldness arises from slowness, and warmth from movement (compare a resting and a running man, he says). Therefore, the earth is the coldest planet, because it is immobile, and the closer a planet is to the earth, the less mobile and, hence, the less warm it is.[52]

To the objection that all planets are of the same speed, as Calcidius and Macrobius had said,[53] William replies that one may save the authority (*auctoritatem seruare*) while at the same time argue that one planet is less

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[51] *Philosophia* §§ 43-46, ed. Maurach, 38-40, have no equivalent in the Boethius commentary. Related to the passage under discussion is the section on the World Soul. It is well-known that William changed his views on the role of the World Soul through the years. William had identified the World Soul with the Holy Spirit in the Boethius commentary, but ascribed the identification to others in the *Philosophia* (ed. Maurach, 23). The concept did not play a role anymore in William's later work, the *Dragmaticon*.

[52] "Vnde autem hoc contingat quod luna sit frigida, dicam scilicet ex tarditate illius, quia omnis calor ex motu est et frigiditas ex tarditate, quod per hoc potest uideri quod homo currens sudat et calet, quiescens friget. Inde terra, quia immobilis est, frigidissima est; omnia autem quae sunt propinquiora immobili minus mobilia sunt et ita frigidiora. Vnde et aqua quae est propinquior terrae minus mobilis est; unde est frigidior. Aer similiter uicinus terrae minus mobilis est; unde est frigidior et spissior. Luna igitur, quia de planetis immobili, id est terrae, uicinior est, minus mobilis est, et inde frigida" (Leipzig 1253, fol.).

[53] *Commentarii in Somnium Scipionis* I.xxi.6, ed. J. Willis, Leipzig 1970, 86; Calcidius, *Commentarius* CXV, ed. Waszink, 160; cf. Martianus Capella, *De Nuptiis Philologiae et Mercurii* VIII.861, ed. A. Dick, revised by J. Préaux, Stuttgart, 1978, 454.

mobile than another: a planet is said to be less mobile, when it moves less air below it. But in that case one would expect more warmth to be generated from the more remote planets above the sun, since these are further away from the immobile (and hence cold) earth and have more air below them. To this William replies that they are so remote that their effects cannot reach the earth. A still different (and more evasive) answer would be that the natures of these planets are `different' (*habent alias naturas*) so that they, while being very mobile, are not warm. Still others think that frozen waters above the firmament offer the key to the solution: The sun is located between the immobile, very cold earth and the frozen waters, and hence is hotter than any other planet; the moon (being closest to the earth) and Saturn (being closest to the frozen waters) are therefore the coldest planets. William does not reject this opinion nor does he state his agreement with it.[54]

This section should be compared with the paragraphs on Saturn in the second book of the *Philosophia*. Here Saturn's reputation for cold leads to a consideration of the same issue how fiery bodies can be cold or are able to cause cold.[55] An explanation in terms of its possible proximity to the frozen waters is now dismissed since William had proved earlier in the *Philosophia* that no such waters exist in the heavens.[56] Others try to account for fiery planets that nevertheless cause cold by saying that fire has several qualities to the effect that something may be glittering (*splendidum*) without being warm (*calidum*): only when something fiery works in dense material, it produces warmth, which may be proved by the difference in warmth in valleys (where the air is dense and humid) and on top of the mountains (where the air is fine). Although the importance of this Senecan principle was recognized by William – he used it at several other occasions –,[57] he ascribes it here to others without committing

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[54] "Vel secundum alios qui dicunt super firmamentum esse aquas congelatas et immobiles. Et ita uolunt duo esse immobilia: inferius, id est terram, et superius, id est aquas congelatas praedictas. Sol uero ita locatus est quod aequaliter distat ab utroque immobili. Ceteri uero planetae propinquiores sunt quidam inferiori immobili, id est terrae, ut Venus, Mercurius, luna; quidam superiori immobili ut Mars, Iupiter, Saturnus. Vnde Saturnus frigidissimus est quia est propinquior superiori immobili, quemadmodum et luna quia ipsa propinquior est inferiori immobili. Vnde sol merito calidior est ceteris, quia ab utroque immobili aequaliter distat; ceteri minus, quia alicui immobilium propinquiores sunt" (Leipzig 1253, fol.).

[55] *Philosophia* II §§ 22-26, ed. Maurach, 49-51. Saturn's reputation for cold was an issue often treated in encyclopedic works, cf. Cicero, *De natura deorum* II.xlvi.119; Seneca, *Naturales Quaestiones* VII.iv.2; Pseudo-Bede, *De mundi celestis terrestrisque constitutione*, ed. Burnett, 44. The section in the pseudo-Bede text on Saturn offers some parallels to William's discussion. The author, like William, enumerates a host of opinions but, unlike William, does not try to explain the phenomena in terms of underlying principles. It is especially this feature that distinguishes William's work from an otherwise similar work as the pseudo-Bede text.

[56] II § 4, ed. Maurach, 42-43: "Restat igitur ibi non esse aquas congelatas."

[57] e.g. *Philosophia*, ed. Maurach, 74-76, *Dragmaticon*, ed. Gratarolus 1567, 180 and 226.

himself explicitly to this position. His own explanation (*Nos vero dicimus...*) follows the account in the Boethius commentary: there are three ways of attributing names of qualities to things: according to effect (*propter effectum*), sense (*propter sensum*) or sign (*propter signum*). Saturn is cold *propter effectum*, for although warm in itself (being a planet), it is termed cold since it causes cold. The question how fiery planets are cold or are able to cause cold is not answered now in terms of proximity to the cold earth and the frozen waters, because he had rejected the very existence of frozen waters. He first suggests that Saturn, unlike the sun, is too far away to make its effects felt on earth, but as if realizing the weakness of this explanation he gives an alternative explanation: although each planet is warm by nature, some have other qualities, unknown to us, which stop heat descending. Baffled by these contradictory views, William leaves it to the reader, however, to solve this question.[58]

Compared to the treatment in the Boethius commentary, William has now cleared his mind on the issue of frozen waters above the firmament. But he still has not applied wholeheartedly, it seems, the principle that heat can only be generated in something dense and humid to the phenomena of `cold' and yet fiery planets, and rather sticks to his own description of several ways of applying adjectives of qualities.[59] Because he has now rejected the existence of the frozen waters and hence the explanation in terms of the proximity of a planet to a cold earth or frozen waters, he need not reply to the objection that all planets have the same speed, and this objection is therefore omitted; but he still retains the suggestions that a) effects may not be felt on earth because the distance is too great, and that b) qualities, unknown to us, may be responsible for heat to stop descending.

Much later in the *Dragmaticon*, William is still found puzzled by this whole issue of how fiery bodies can be cold or are able to cause cold. Perhaps out of frustration of not being able to provide a satisfactory physical mechanism of the qualities and effects of the planets in terms of elements and elemental particles, he suggests at last that Saturn may be cold *propter signum*: it merely signifies cold (and evil).[60] Particularly, on this score of the relationship between

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[58] "Sed quia in medio proposuimus quaestionem nec omnia possumus omnes, sit ingenii uniuscuiusque inquirere, quid pro solvenda hac quaestione possit invenire" (II § 26, ed. Maurach, 51).

[59] Later in the *Philosophia*, however, he did employ this same principle: Although there is fire in the supralunar world, it has no *fervor* because there can be no heat in the absence of thick material (III § 8, ed. Maurach, 75-76).

[60] *Dragmaticon* IV, ed. Gratarolus, 101-102; R. Klibansky, E. Panofsky and F. Saxl, *Saturn and Melancholy*, London 1964, 118 considered this theory to be a revival of the idea of the stars as symbols rather than active forces; see Elford, *Developments in Natural Philosophy*, 118-119 for William's change of mind (cf. her `William of Conches', 322). Elsewhere in the *Dragmaticon* (ed. Gratarolus, 82-83), however, William had `proven' Saturn's cold through its effects on the air. It is apparently very hard to account for the coldness of a planet in terms of elements and

the upper and the lower world, explanations in terms of elements and elemental particles, which were William's key concepts, turned out often to be inadequate.

Wandering planets (I metre 2, lines 10-11)

The wandering movements of the planets are mentioned by Boethius in the next lines of Book I metre 2 (*quaecumque vagos stella recursus / exercet varios flexa per orbes*). In the course of his career William came to accept and dismiss several theories of the apparent halts (*stationes*) and retrograde movements (*retrogradationes*) of the planets on their way from west to east, and again the Boethius commentary was used as a stepping stone to explore the issue.[61] In this passage William mentions two explanations: some people, considering these movements as real, attribute them to the influence of the sun, which makes them halt or move backwards depending on their position in relation to the sun.[62] Others say that the halts and retrograde movements are only appearances, and explain them in terms of `elevations' and `depressions' when the planets move away or, respectively, towards the earth. These elevations and depressions can be `straight' (in this case the planet seems to stand still) or `oblique' (in this case the planet seems to move backwards).[63]

To the objection that in this case philosophers have lied in speaking about these movements when they are merely appearances, William replies that one may speak in three ways about the planets: *fabulose* (as Nemroth, Hyginus and Aratus have done), *astrologice* like here (as Martianus Capella, Macrobius and `almost everyone else' have done in describing the appearances), and *astronomice* (as Ptolomy and Iulius Firmicius have done in providing physical explanations of the appearances).

The difference with the discussion in the *Philosophia* is small but significant.[64] The formulation of the first theory is slightly different but the main

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elemental qualities.

[61] This issue was often touched on in the literature, see e.g. Calcidius, *Commentarius* LXXIV, ed. Waszink, 122ff.; Macrobius, *Commentarii in Somnium Scipionis* I.xxi.10, ed. Willis, 86-88.

[62] Cf. Pseudo-Bede, *De mundi celestis terrestrisque constitutione*, ed. Burnett, 38: "Causa autem huius stationis perhibetur Sol esse."

[63] "Alii dicunt quod numquam stant uel retrogradantur, quia contra naturam earum hoc est, sed ita aliquando uidetur, uel ex arsi uel thesi, i.e. eleuatione uel depressione earum, quia dicunt eas aliquando eleuari quando excedunt circulos suos plus solito elongantes a terra, aliquando deprimi plus solito infra suum circulum propinquantes terrae. Sed eleuatio illa aliquando fit recta, aliquando fit flexa aliquantulum retro; similiter depressio. Quando eleuantur uel deprimuntur recte uidentur stare, quando uero flexe uidentur retroire, et ita neque stant neque retroeunt, sed ita uidetur" (Leipzig 1253, fol.).

[64] *Philosophia* II §§ 33-35, ed. Maurach, 53-54.

point has remained the same, that is that the sun causes them to stop or to go backwards (§ 33). Of the second theory William now provides an explanation: Sometimes the planets draw up more moisture from the earth than usual when they have been dried up by the sun. This makes them heavier, so that they descend.[65] Some manuscripts of the *Philosophia* still attribute this explanation to others (*alii*), but in the text as printed by Maurach, it seems to be William's own preferred view (*Nos vero dicimus...*).[66] Interestingly, one manuscript of the Boethius commentary inserts this explanation, and together with the group of manuscripts of the *Philosophia* just mentioned, it may represent an intermediate stage in William's thinking.[67] At a much later stage, in the *Dragmaticon*, William can still be found toying with the same set of physical explanations, but a major new theory is presented as well, one which is not based on elements and elemental qualities: a version of the `Chaldeans' epicycle and eccentric theory, that William may have encountered in al-Batt_n_ or al-Fargh_n_. He does not, however, wish to denounce or to affirm any of the four theories he discusses (*nullam de his confirmo vel damno*).[68]

It has been inferred from William's distinction between astrological and astronomical descriptions of the planetary movements in the *Philosophia* (but as was seen above, the passage already occurs in the Boethius commentary), that William `accomplished a thorough transformation of Latin astronomy, changing its character by making way for reasoned theory, which would fit well with the mathematical Greco-Arabic texts to appear over the next decades of twelfth century'.[69] This is exaggerated. William (unlike Adelard of Bath and Hermann of Carinthia) was not an expert in astronomy nor widely read in this field; and his natural philosophy, based on a ubiquitous role for the elements and elemental qualities, often hindered rather than forstered an unconditioned acceptance of astronomical-mathematical theories like the eccentric-epicycle theory.

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[65] "Cum enim sit fons totius caloris, aliquando plus solito desiccat superiora et inferiora, unde desiccata corpora stellarum, plus solito levia, ascendunt. Si iterum ad nutrimentum sui plus solito attrahat humorem, plus solito humida et gravida reddit ea, unde plus solito descendunt. Quod ergo dicuntur stare, astrologicum est, quia sic videtur" (II § 35, ed. Maurach, 54).

[66] *ibid.*, *app. crit.*, 53.

[67] Troyes, Bibl. mun. lat. 1101, fol. *** Cf. *supra* n. 42.

[68] *Dragmaticon* IV, ed. Gratarolus, 108-109. See Gregory, *Anima mundi*, 228-230; R. Lemay, *Ab_ Ma'shar and Latin Aristotelianism in the Twelfth Century*, Beirut 1962, 97 cites Ab_ Ma'shar's *Introductorium Maius* IV 4.

[69] Bruce Eastwood, `Celestial Reason: The Development of Latin Astronomy to the Twelfth Century', *Man and Nature in the Middle Ages*, ed. S. J. Ridyard and R. G. Benson, Sewanee, TN 1995, 157-172, on 171. But see Elford, *Developments in the Natural Philosophy*, 120ff. and Burnett, *Hermann of Carinthia. De Essentiis*, 24-25.

Thunder and lightning (I metre 4, lines 9-10)

William's discussion of thunder and lightning is found in his commentary on Book I metre 4, where Boethius mentions the `blazing thunderbolt that strikes down lofty towers' (*celsas soliti ferire turres / ardentis via fulminis movebit*). William's explanation runs as follows. Departing from the Senecan principle that warmth needs moisture (*humor*) for its preservation, William writes that this rising moisture is the cause of turbulance in the air. We may compare this, he writes, with the turbulance of the sea which also starts at the botton and then moves upwards. The appearance of seals at the sea surface (or dolphins in at least one manuscript), that usually sleep at the botton of the sea, is a sign to sailers that a storm is at hand. So also in the case of air: when the turbulant movement (*impetus*) has reached the upper parts of the air, the air particles begin to move and by colliding cause thunder and lightning (like a collision of stones cause *splendor* et *fragor*). Because light (that is, *visus*, sight) is quicker than sound, we first see the lightning, then hear the thunder. The *impetus*, when moving upwards or moving downwards without reaching anything, is a thunder without lightning (*tonitrus sine fulmine*). When it reaches the earth (that is, in general, an obstacle), it is a *fulmen*. It depends on the humidity in the lower regions whether the thunder will be able to ignite and becomes a *findens et fulmen urens* (splitting and burning) or whether it will remain a *fulmen findens* (splitting only). In summer, when the lower air is less humid, there will be more often thunder and lightning than in other seasons.

A comparison with the corresponding passage in the *Philosophia* shows that William has retained much of the text, but also altered some details.[70] While the mechanism of the rising vapour that causes turbulance in the air is the same in both passages, William now employs the `technical' term *fumus*, which was to play an important role in his system, instead of `warm moisture' (*humor*).[71] The entire discussion in the *Philosophia* is slightly more systematic and terminologically more worked out[72], and the analogy between the turbulance of the air and that of the sea is now inserted further on in the discussion where the question is raised why there is no thunder and lightning in every season. An interesting addition is William's reference to a theory of thunder in terms of stony substance, which he rejects (III §§ 16-17). If Elford is right in suggesting that William could have drawn on Adelard of Bath's *Quaestiones naturales*, where a version of this theory is found, its absence in an

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[70] *Philosophia* III §§ 14-21, ed. Maurach, 77-79.

[71] He may have derived the term *fumus* from Constantine's *Pantegni*. Rising *fumus* plays a role in the explanation of wind (*Dragmaticon*, ed. Gratarolus, 160), rain (*ibid.*, 170; cf. *Philosophia*, ed. Maurach, 74) and thunder and lightning (*Dragm.*, 181; *Phil.*, 77-78). On *fumus*, see Elford, `William of Conches', *HTWP*, 326 plus notes.

[72] E.g. "Est ergo fulmen... Tonitruum vero est... Coruscatio vero est ..." (ed. Maurach, 78).

otherwise very similar passage in the Boethius commentary may indicate that Adelard's work became available to William around this time.[73]

Elements (III metre 9, lines 5 and 10-12)

One of the most discussed themes of William's natural philosophy are the elements, but here again the discussion has always taken the *Philosophia* as its starting-point. While the later development in William's thinking on the elements from the *Philosophia* to the *Dragmaticon* has now been explored by several scholars, it remains to be seen in what way the discussion in the Boethius commentary, which has largely gone unnoticed, prepared the way for William's well-known discussion in the *Philosophia*.[74] For the sake of clarity I now start with the later work.

In the *Philosophy*, as is well known, William had introduced a distinction between *elementata* and *elementa*, that is between the four visible elements and the elemental particles which compose all bodies and which occur in four varieties: warm and dry (fire), warm and moist (air), cold and moist (water), and cold and dry (earth). William's debt, as he himself points out, is to Constantine's *Pantegni*. William took over Constantine's definition of *elementum* as a simple and minimal particle, but the interpretation of it in terms of simple as to quality and minimal as to quantity was his own. From where he got the term *elementatum* is unknown – he may have coined it himself –, but the most likely explanation is, I think, that he had found it in a commentary on some medical text from the *Articella* corpus (see below).[75]

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[73] Elford, *Developments in the Natural Philosophy*, 166-167. On the relationship between Adelard and William, see below note 84.

[74] Only H. E. Rodnite has taken the Boethius commentary into account; see her *The Doctrine of the Trinity*, 15-37; 108-111; 290-294. T. Silverstein, `*Elementatum*: Its appearance among the twelfth-century cosmogonists', *Mediaeval Studies* 16 (1954), 156-162 mentions the work but does not discuss it. For the later developments (between the *Philosophia* and the *Dragmaticon*), see Elford, *Developments in the Natural Philosophy*, 1-64 (with discussion of older literature), summarized in her `William of Conches', 311-317. Still fundamental is Gregory, *Anima mundi*, 201-212; Speer, *Entdecte Natur*, 163-192 is a recent good survey, although he hardly pays attention to William's complicated use of Constantine. B. Pabst, *Atomtheorien des lateinischen Mittelalters*, Darmstadt 1994, 107-132 (on William) must be used with caution (cf. Speer's justly critical remarks, 186 n. 159).

[75] See Silverstein, `Elementatum', and *ibid.*, `Guillaume de Conches and the Elements: *Homiomeria* and *Organica*', *Medieval Studies* 26 (1964), 363-367; R. McKeon, `Medicine and Philosophy in the Eleventh and Twelfth Centuries: The Problem of the Elements', *The Thomist* 24 (1961), 211-256; R. Lemay, *Ab_ Ma'shar and Latin Aristotelianism*, 178ff. argued that William took it from John of Seville's 1133 translation of Ab_ Ma'shar's *Introductorium Maius*. Its occurrance in an early twelfth-century commentary on Johannitius' *Isagoge ad artem Galeni* in MS Oxford, Bodleian Library, Digby 108, fol. 5` (see B. Lawn, *The Prose Salernitan Questions*, 2-3) points, however, to a medical-philosophical context.

The clarity of the discussion in the *Philosophia* is not enhanced by the shift of perspective halfway William's treatment, for in § 24 he writes that the true elements are the four visible elements: earth with its animal life, water with its fishes, air with its birds, and fire.[76] How is this to be reconciled with the Constantinian definition of an element as a simple and minimal particle? William's answer is that Constantine as *physicus* spoke about the nature of corporal bodies, and thus came to his definition of elements as minimal and simple bodies. *Philosophi*, however, speak about the creation of the world and its first principles, and hence use elements in the sense of its four constituent parts, namely fire, air, water and earth. The two positions are therefore not contrary; it is just a difference of perspective. What is called *elementata* in one approach, may still be called *elementa mundi* in the other.[77]

Leaving aside William's further discussion of the elements and the elemental particles in the *Philosophia*, we may now turn to the Boethius commentary, where a long discussion is occasioned by Boethius' reference to the elements in his hymn on the creation of the world (III metre 9). Almost all people, William begins his discussion, say that earth, water, air and fire that are seen by us are not the elements (*elementa*) but *elementata* [*elementa* in the majority of manuscripts, however], namely what is composed out of elements (*Dicunt enim fere omnes non esse elementa quae uidentur a nobis, scilicet terra aqua aer ignis, sed elementata, id est ab elementis composita*).[78] They claim the

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[76] "Sunt alii qui dicunt ista quae videntur esse elementa comprobantes hoc auctoritate Iuvenalis..., in terra scilicet venationes, in aqua pisces, in aere volucres" (p. 28).

[77] "Constantinus igitur ut physicus de naturis corporum tractans simplices illorum et minimas particulas elementa quasi prima principia vocavit; philosophi vero de creatione mundi agentes, non de naturis singulorum corporum, ista IIII quae videntur elementa mundi dixerunt quia ex istis constat... Nulla ergo inter hos contrarietas" (I § 24, ed. Maurach, 29).

[78] This is a striking opening, for the distinction drawn looks very similar to the one in the *Philosophia*. There has been much debate about when and how the term *elementatum* was introduced in the medieval West (see note 51). Most scholars have thought that it was William who had used the term for the first time in the *Philosophia*, or had even coined it himself. Its occurrance in the Boethius commentary has hardly been noticed and must therefore be briefly discussed here.

First we must notice that only a few manuscripts of the Boethius commentary have this reading *elementata*; the majority of manuscripts reads *elementa*. Both readings present serious difficulties. The reading *elementa* gives an odd sentence: "earth, water, air and fire that are seen by us are not *elementa* but *elementa*, namely what is composed out of elements" – the sentence obviously needs contrasting terms. The reading *elementata* seems to fit the context much better, but the problem with this reading is that William here ascribes the distinction between *elementa* / *elementata* to *other* people ("almost all people") and *rejects* it, while in the *Philosophia* he presents the distinction as something new and is clearly proud to introduce such uncommon notion as *elementata*. One could argue, however, that William objects not to the term *elementata* but to doctrine implied by that term. Given William's own preferred view (the elements are visible fire, air etc.), however, he would have been against any distinction between the visible elements and something more basic, and thus against any term that implies the

authority of Plato for their view, who is supposed to have said (*Timaeus* 49D-E) that because the visible elements can be dissolved into each other (for example, earth in water), they cannot be the true elements: true elements must be unchanging, hence what does dissolve is not the element *terra* but *terreum* (`earthy'), not the element *ignis* but *igneum* (`fiery'). All that visible fire, earth etc. deserve to be called is *igneum*, *terreum* etc. These philosophers, William continues, also have other reasons for stating that the visible elements consist of all the other elements (and hence cannot be the true elements): water and earth could never become hot nor fire be obtained from a stone if the element fire were not originally in their composition. These people even go so far as to claim, rather foolishly, that they have fire in their beard and hair; they should be called *philosofolli* rather than *philosophi*.[79]

In refuting this view,[80] William points out that one should distinguish between something inhering *naturaliter* in something and inhering *accidentaliter* (cold earth may become hot, but this does not mean that warmth inheres *naturaliter* in earth; it just enters it from the outside). William further says that they have falsely appropriated Plato's authority. According to him, Plato was not referring to something more basic than the four elements: *terreum* means just

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existence of something more basic.

William may of course have changed his views – as he did all the time – but in this case one would at least have expected the term used commonly in early twelfth-century treatises – *quod non*.

What at least shall become clear is that whatever reading we choose, there is surely no distinction made in the Boethius commentary between elements and elemental particles as is done in the *Philosophia*.

[79] Cf. *Glosae super Platonem*, ed. Jeauneau, 224 (on *Timaeus* 42E): "Et nota quod non dicit [i.e. Plato] ex qualitatibus elementorum humanum corpus constare ut quidam gartiones confingunt, garrientes quod si ex igne constaret homo, haberet ignem in barba et sic exureretur (...)." Cf. also the passage from William's Macrobius commentary, which is, however, not entirely clear to me: "Non est enim corpus quod non constet ex IIII elementis, etsi non omnia in eo dominantur. Concedimus etiam quod in hoc lapide sunt omnia elementa et ignis et aer etc. Similiter in hoc ligno et in hoc ere et ita de singulis quidem rationibus phisicis in loco suo facile potest probari. Hec tamen sententia postposita est a multis propter huiusmodi vulgares obiectiones quod tunc in barba mea est ignis. Hec enim secundum vulgare habet dicere quod in barba habeam ignem et in manu aquam" (ed. in Rodnite, *The Doctrine of the Trinity*, 290-291). William's cursory treatment of the elements in this work suggests that it antedates the Boethius commentary, but Rodnite is right in saying that the passage is "too short for us to judge with any certainty the place of a work with such a complicated textual tradition in the corpus of our author [i.e. William]" (p. 37). I have therefore omitted it from further consideration.

[80] Is Hermann of Carinthia refuting the same opinion in his *De Essentiis* where he writes: "(...) these same men [i.e. the *medici*] write that each of the four elements is made from all of them, but at the same time they profess that the elements are the `the same' in their essence" (*De Essentiis*, ed. and transl. Burnett, 95)?

that part of the element *terra* that dissolves into water.[81]

William rejects others theories on the true nature of the elements as well.
a. *elementa* as properties of the four visible elements (this theory is discussed in more detail and rejected in the *Philosophia* I § 23)[82];
b. *elementa* as species of which things which are seen are the individuals[83];
c. *elementa* as pure forms (pure fire, pure air, etc.) without the properties of the others; these pure forms, however, do not exist as such (*nusquam esse pura actu*) but only in composition.[84]

What all these theories have in common is a distinction between the visible elements and the true elements (whatever their precise status) that constitute them. William does not adhere to any such theory in the Boethius

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[81] "Quod uero Plato quaerit quare magis dicatur terra quam aqua, et postea affirmat terreum non terram, et sic de aliis, intelligendum est Platonem hoc dixisse non de elementis, immo partibus eorum, quae in alia dissoluuntur. Numquam enim totum elementum in aliud resoluitur. Dicatur igitur secundum Platonem quod dissoluitur in aquam terra non est, sed terreum, i.e. pars terrae; quod uero remanet, terra est et elementum" (Leipzig 1253, fol. on III m. 9). But in roughly the same passage in the *Philosophia* I § 26 (ed. Maurach, 29-30), the term *elementatum* is not used, which may suggest that we should read *elementa* rather than *elementata* in the passage quoted above. In the *Glosae super Platonem* (ed. Jeauneau, 272) William uses the term *elementatum* to denote what is dissolving into another element: "Alii dicunt istud visibile numquam dissolvi, sed minorem partem dissolvi, maiorem remanere. Quod ergo de unoquoque dissolvitur, non est elementum sed elementatum [but these last two words are omitted from two MSS - see app. crit. ad loc.]; sed quod remanet semper, est elementum. Quod ergo dissolvitur de igne est igneum; quod remanet, ignis est. Et sic de aliis intelligatur."

[82] But in his commentary on II m. 8, lines 3-4 (*pugnantia semina*) William writes however: "*semina*, id est quattuor elementa, quia omnia corpora ex eis ut ex semine habent esse; *pugnantia*, quia habent pugnantes et contrarias proprietates, cum quedam sint calida, quedam frigida... " (Leipzig 1253, fol. ; Leiden BPL 181A, fol. is the only MS that has "elementatas").

[83] This theory is also mentioned in the *Glosae super Platonem* (ed. Jeauneau, 272). William may be alluding to a version of the theory propounded by Hermann of Carinthia (see *De Essentiis* 61rE-62rC, ed. Burnett, 98-104), although Hermann's work, finished in 1143, seems to be too late to be the object of William's criticisms. Hermann favoured a view of the elements as incorporeal `universal singles', and strongly opposed any suggestion of elements as *corporeal* first particles.

[84] He may have Adelard of Bath in mind who held such a view (see *Quaestiones naturales* I, ed. Müller, 6). Dr Charles Burnett from the Warburg Institute (London) pointed out to me that there are some striking similarities between the discussions of both philosophers. Both scholars summarize Plato's view of the elements in a similar way; both mention the inhabitants of the four elements; and both discuss the accidental and natural qualities of the elements. I have already pointed to a possible link between Adelard and William above (on the cause of thunder). The precise relationship between the two scholars remains a puzzle in the absence of any literal correspondence between the *Quaestiones naturales* and the works of William, but it seems clear that from the time of the composition of the *Philosophia*, William was able to draw increasingly on Adelard's work or at least on the same sources that Adelard employed.

commentary, for he continues to give as his own view that the elements are the ones we find in the world. His formulation is much the same as in the *Philosophia*: elements are fire, air, water and earth, which are seen by us as separated; earth is inhabited by men and reptiles, water by aquate animals, air by birds, and fire by celestial beings.[85]

Thus, William's own theory that `the matter of the world are the four elements, not the fantasies of stupid people' (*materia ergo mundi sunt ista quatuor elementa, non illorum stultorum ficticia*), is basically the same as the one presented in the *Philosophia*, but there it is complemented, as we have seen, with the definition of an element as a simple and minimal particle, which he had derived from Constantine's *Pantegni* (both perspectives are summed up and `reconciled' in the statement at the beginning of *Philosophia* I § 27: *Sunt ergo elementa corporum praedictae particulae ut ait Constantinus, sed elementa mundi quae videntur*; resembling William's summary statement in the Boethius commentary just quoted).

When comparing the two texts, we clearly see not only that William, at the time of writing the Boethius commentary, had not yet discovered Constantine's *Pantegni*, but also that, after his discovery of Constantine's "physicist's" approach of the elements, he takes pain to present this approach as complementary to and in no way irreconcilable with his own "philosopher's" view of the elements as being the four visible elements, which he had already defended in the Boethius commentary. The reason why he felt the need to state so vigorously that the two approaches are complementary, may be the appreciation that began to dawn upon him of all those scholars who had argued for a distinction between the visible elements and something more basic (whatever the precise character of that more basic level) were not so foolish after all. But William was clearly not the type of scholar who would gladly give other people the credits they deserved.

Further comparison reveals the following similarities. Just as in the Boethius commentary when William, after having presented his own theory, went on to refute the arguments of those who had argued that visible earth, water etc. cannot be the true elements because of their impurity (each is composed out of the other elements), so in the *Philosophia* (I §§ 25-26) too he follows that same order of argumentation.[86] He also gives the same

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[85] "Immo placet michi elementa esse quae uidentur a nobis separata, scilicet terra et aqua et cetera. Et unum de elementis inhabitant homines et reptilia, scilicet terram; sed aliud aquatilia, scilicet aquam; aliud uolatilia, scilicet aera; aliud caelestia, uidelicet ignem" (Leipzig 1253, fol. on III m. 9).

[86] Cf. III § 7, ed. Maurach, 75 where William also rejects the view that an element is composed out of the other elements. Again, this may suggest that we have to read *elementa* rather than *elementata* in the opening sentence of the entire passage on the elements discussed above; see *supra*, notes 78 and 81.

interpretation of the Plato quotation, and employs the same distinction of *naturaliter* (now termed *substantialiter*) and *accidentaliter*, and rejects the same set of the theories on the true nature of the elements.

Thus, the most striking difference between the two works is the absence in the Boethius commentary of Constantine's definition of the element as a simple and minimal particle, and William's elaboration of this definition. The entire first part of William's discussion of the elements in the *Philosophia* (I §§ 19-23), therefore, does not find a parallel in the Boethius commentary.

Conclusion

The evidence presented above gives the following picture of the early development of William as natural philosopher. From an early age William must have been interested in questions concerning the workings of the cosmos, for already in his first work, the commentary on Boethius, he was able to insert long passages by way of exposition of Boethius' allusions to natural phenomena. Much of this material was later used for incorporation in the *Philosophia*, and it is very likely that they were originally written with that aim in mind. The fact that William did not consider these digressions irrelevant to or out of place in a commentary on a work such as the *Consolatio* tells us much about the William's conception of the *glosa* as tool for presenting views on a variety of philosophical issues. Most of the material had underwent revision and modification by the time William used it for incorporation into the *Philosophia*. These modifications, minor though they may seem, form an significant indication of William's readiness to adapt himself to new knowledge and, in general, to the momentum of change in the intellectual climate of the early twelfth century.[87] The new knowledge was derived mainly from medical texts recently translated. We have encountered several instances in the *Philosophia* of William's acquaintance with the works of Constantine (one should, however, not forget the increasing degree of appropriation of `native' works such as Plato's *Timaeus* and Marobius' *In Somnium Scipionis*). Due to the reading of these texts, William began to see more uniformity behind the manifold phenomena in the cosmos. His explanations involved the use of the four elements, the elemental particles, the concept of *fumus*, and basic principles such as that heat is only generated in something dense. A comparison between the Boethius commentary and the *Philosophia* has shown small but significant differences in his treatment of the brains, the winds and tides, the elements, the movements and qualities of the planets, thunder and lightning, and the enfolding of natural life.[88]

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[87] Cf. Lemay, *Ab_ Ma'shar and Latin Aristotelianism*, 169, who however does not distinguish sufficiently between the different works of William.

[88] Added to this, William not only revised his material, but also polished his style and

This brings me to the difference in genre between the two works. The way in which his natural philosophy evolved is reflected to some extent by the structure of his works. William became acquainted with a growing number of opinions and theories, which he found in `new' as well as `old' sources. These alternative views, often ascribed to *quidam* and *alii* (which is not surprising, given the fact that many texts circulated anonymously) could be introduced, changed, and omitted as often as one wished. Such expressions as `uel aliter', `quidam dicunt' and `alii dicunt' were the pegs on which all these alternative opinions could be hung, and which facilitated the circulation of already used material or the insertion of new material in later redactions. It was essentially the job of any commentator to collect and select alternative glosses and readings, and in this respect, I think, the evolution of William's natural philosophy can be fruitfully seen against the background of the traditional practice of glossing and commenting on the ancient texts. The *glosa* was a suitable form for bringing together different ideas and opinions from a great variety of sources, thereby itself becoming a sort of encyclopedia from which other commentators on their turn could pick out what they wished. This process, which was not only accumulative (for material was lost, and opinions rejected and omitted), already started with the Carolingian glossators (to restrict ourselves to the Latin West), and William clearly stood with one foot in these age-old traditions. He extracted his theories not only from encyclopedic works but also from glossed copies of the works of Boethius, Macrobius, Plato and Martianus Capella. What was innovative in William (apart from much else) was his attempt to put his own stamp on this heterogeneous material. Because of this very attempt to explain the multifaceted world with the aid of a limited number of principles and mechanisms, William was bound to reach sooner or later the limits of the *glosa* as forum for advancing `new' ideas. While it remained largely a bookish affair, natural philosophy was becoming a field that went beyond the traditional practice of glossing school texts. The *glosa* as it was developed by Bernard of Chartres and William of Conches out of older commentary traditions, could accompany the evolution of Latin speculation on natural philosophical themes only to a certain point. Viewed from this perspective, William's commentary is an exemplary text of its time, and in comparison with the *Philosophia* shows the possibilities as well as the limitations of the *glosa*.

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terminology.