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Urso of Salerno on Prime Matter between Plato and Aristotle

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I

MATIÈRE PREMIÈRE ET HYLÉMORPHISME

PRIMARY MATTER AND HYLOMORPHISM

1

Urso of Salerno on prime matter between Plato and Aristotle

Urso de Salerne
sur la matière première
entre Platon et Aristote

RÉSUMÉ DÉTAILLÉ

L'article fait d'abord le point sur les renseignements connus concernant la vie et l'œuvre du médecin Urso de Salerne, actif à la fin du ^x^e siècle et au début du ^{xiii}^e siècle. Il est l'auteur d'au moins quatre ouvrages touchant soit à la théorie soit à la pratique médicale : *De effectibus qualitatum opusculum*, *De Aphorismis libellus*, *De commixtionibus elementorum libellus*, *Glosulae in Aphorismos*. En développant des indications fournies dans les travaux de Danielle Jacquart sur l'école médicale de Salerne, l'article examine ensuite les relations entre l'œuvre d'Urso et les traductions gréco-latines et arabo-latines des *libri naturales* d'Aristote effectuées au ^{xiii}^e siècle en Italie et en Espagne. Il est en effet difficile de détecter des emprunts précis et certains de la part d'Urso aux ouvrages d'Aristote, bien que ses écrits dégagent une ambiance aristotélicienne qui pousse à croire qu'il a bien dû lire les *libri naturales*. En particulier, Urso recourt très souvent au concept aristotélicien de mouvement

des quatre éléments vers leurs lieux naturels : le feu et l'air se dirigent loin du centre de l'univers tandis que l'eau et la terre se dirigent vers le centre de l'univers. Urso applique ce principe théorique à sa physique sublunaire : la direction des mouvements des éléments rend compte de phénomènes naturels et explique les effets de certains corps composés et des substances qui peuvent être employés dans la pharmacopée. Cependant, Urso n'est pas le premier à se servir au XII^e siècle du concept de lieux naturels, les mouvements des éléments étant déjà évoqués dans le *Dragmaticon philosophiae* de Guillaume de Conches rédigé dans les années 1147-1149. Après ces mises au point indispensables, l'article étudie le concept d'*yle*, la matière première, dans le *De commixtionibus elementorum libellus*, un ouvrage qu'Urso lui-même rattache à la partie théorique de la médecine. C'est en effet le seul ouvrage où Urso parle de la *yle*, précisément dans le premier chapitre. Certains passages sont très proches du *De processionem mundi* du traducteur et philosophe toledan Dominique Gundisalvi ainsi que du *Commentaire sur l'Isagoge Iohannitii* du médecin Marurus de Salerne. Urso explique que la *yle* est créée *ex nihilo* par l'*opifex* et il décrit longuement ses caractéristiques qui sont reprises du *Commentaire sur le Timée* de Calcidius : elle est entre le rien et quelque chose, elle n'a pas de forme mais elle est capable de recevoir des formes, et ainsi de suite. La *yle* d'Urso présente une coloration à la fois aristotélicienne et platonicienne, comme déjà chez Calcidius d'ailleurs. De la *yle* naissent les éléments purs qui se mélangent aussitôt, instantanément, entre eux donnant naissance aux élémentés. Chaque élémenté est en effet formé des quatre éléments et c'est l'élément prépondérant qui détermine la nature de l'élémenté, c'est-à-dire que l'élémenté feu est appelé de la sorte parce qu'il contient plus de feu que d'air ou d'eau ou de terre. Une fois les processus naturels entamés, la *yle* disparaît totalement : les transformations réciproques des élémentés s'effectuent directement entre eux, sans intermédiaires et surtout sans passer par la *yle*.

The physician Urso of Salerno occupies an important place in twelfth-century medicine and physics*. Yet only his *De commixtionibus elementorum libellus* is readily available in a reliable critical edition; other of his works were edited in German publications in the early twentieth century, but these were based on just a few manuscripts (selected following insufficiently scholarly criteria) and are somewhat inaccessible. As a result, Urso's work remains unknown to most medievalists. The present article proposes to study the concept of *yle* or prime matter in Urso's *De commixtionibus elementorum*, the only one of his works to include a lengthy development on *yle*. Given the lack of systematic studies on Urso of Salerno, the article begins by briefly outlining a tentative chronology for his theoretical works. It then studies Urso's work in the context of such of Aristotle's writings on natural philosophy as were available in translation in the twelfth century, as Urso frequently draws on Aristotelian notions such as motion and elementary qualities to explain natural phenomena.

Urso's work

Information on the life of Urso of Salerno is scarce¹. The necrology of the *Liber confratrum* at the cathedral of San Matteo in Salerno indicates "obiit magister Urso" on November 19, 1225, and "obiit Matheus de Raynaldo frater magistri Ursonis" on May 20,

* Transl. by Michael Chase (CNRS, Paris) and Susan Pickford (University of Paris 13). I am grateful to Barbara Obrist (CNRS, Paris) for her valuable remarks on a first draft of this article.

1. W. Stürner includes an account of Urso's biography in his introduction to Urso Salernitanus, *De commixtionibus elementorum libellus* (Stuttgart, 1976), p. 7-9. W. Stürner uses C.A. Garufi's edition of *Necrologio del Liber Confratrum di S. Matteo di Salerno* (Rome, 1922); following Garufi, p. 181, he mentions a *magister Urso philosophus* who died on November 15 of an unspecified year in the late twelfth or early thirteenth century.

1193². Fortunately, information is more readily forthcoming about his writings, since Urso lists his own works in the prologue to *De commixtionibus elementorum libellus*. He notes that the Latins have many works on practical medicine, but lack theoretical works. He then goes on to explain that he has already composed works of theory entitled *De Aphorismis libellus* and *De effectibus qualitatum opusculum* and that he has decided to write the *De commixtionibus elementorum libellus*, an arduous work of theory, at the behest of his “socii”³. Urso again refers to his *De effectibus qualitatum* at the beginning of chapter II⁴. Furthermore, several of the *Glosulae* he composed on his own *Aphorismi*⁵ refer the reader to the *De*

2. See M. Galante’s corrections to Garufi’s edition of the *Necrologio*, “Un necrologio e le sue scritture: Salerno, secoli XI-XVI”, *Scrittura e civiltà*, 13 (1989), p. 49-328 (death of Urso, *ibid.*, p. 178-179; death of Urso’s brother, *ibid.*, p. 174-175). M. Galante classifies the notices in the necrology according to the different scripts (Beneventan script, Caroline, Gothic, etc.), and in chronological order.

3. Urso of Salerno, *De commixtionibus elementorum*, Prologus, p. 37-38.

4. *Ibid.*, p. 51: “*In presenti vero negotio de effectibus, qui nascuntur ex qualitibus elementorum nullo medio, nostra intentio est. De illis enim effectibus, qui mediante aliquo scilicet mediantibus complexivis qualitibus ex elementorum qualitibus fiunt, in eo opere, quod inscribitur De effectibus qualitatum, tractavimus.*” In the conclusion of *De commixtionibus elementorum*, found only in the two English manuscripts, Urso refers to his *De effectibus qualitatum*, *ibid.*, p. 209: “*Habeant hec metam, que proposuimus. Docuimus enim de effectibus qualitatum ipsorum elementorum predictis similibus in alio opusculo. In presente vero tractatu pro modulo tenuitatis nostre principaliter de elementorum effectibus tractavimus immediatis decem rerum principia distinguentes.*”

5. Urso of Salerno, *Aphorismi cum glosulis* 9, ed. R. Creutz, “Die medizinisch-naturphilosophischen *Aphorismen* und *Kommentare* des Magister Urso Salernitanus,” in *Quellen und Studien zur Geschichte der Naturwissenschaften und der Medizin*, 5/1 (1936), p. 18: “*Sed quoniam pro brevitate sui non modicum omnino legentibus videbatur obscurum [scilicet libellum de aphorismis], idcirco has glosulas non minimo labore composui, quibus cuiuslibet afforismi expositio sufficiens et manifesta legenti occurrit.*”

commixtionibus elementorum libellus on issues pertaining to the mixture of elements⁶. These multiple references allow us to draw up a chronology of his theoretical works:

- 1) *De effectibus qualitatum opusculum*
- 2) *De Aphorismis libellus*
- 3) *De commixtionibus elementorum libellus*
- 4) *Glosulae in Aphorismos*

Dating the *De effectibus qualitatum* is problematic. Excerpts were included in the manuscript Breslau, cod. 1302, f. 200v-201v (under the title *De qualitibus et eorum effectibus*), which was destroyed during World War II. K. Sudhoff described the Breslau manuscript in the early twentieth century and dated it to between 1160 and 1180, holding its texts to be the most important collection of Salernitan medicine⁷. The destruction of what was presumably a highly significant manuscript represents a considerable loss for medieval medicine, particularly as Sudhoff's article only reproduces two columns from two different folios. Recently, M. Green dated the manuscript to the end of the twelfth century, on the basis of a few photographs of the manuscript preserved in a private archive; she

6. On Urso's prologue to his *Glosulae*, see D. Jacquart, "L'écriture par excellence du texte médical: les aphorismes," in C. Thomasset, ed., *L'Écriture du texte scientifique au Moyen Âge. Des origines de la langue française au XIII^e siècle* (Paris, 2006), p. 133-140.

7. K. Sudhoff, "Die Salernitaner Handschrift in Breslau (Ein *Corpus medicinae Salerni*)," *Archiv für Geschichte der Medizin*, 12 (1920), p. 101-148. C. Matthaes produced a non-scholarly edition of *De effectibus qualitatum* in *Der Salernitaner Arzt Urso aus der 2. Hälfte des 12. Jahrhunderts und seine beiden Schriften „De effectibus qualitatum“ und „De effectibus medicinarum“* (Diss., Leipzig, 1918). I wish to thank T. Ricklin (Ludwig-Maximilians-Universität, Munich) for sending me a photocopy of this text. The extracts preserved in the Breslau manuscript (see Sudhoff, "Die Salernitaner," p. 117) differ in several places from C. Matthaes's text, published on the basis of three manuscripts. I have carried out an initial survey of the manuscript sources with a view to producing a critical edition and have identified nineteen manuscripts.

also presents the case that it was written in northern France⁸. The date of the Breslau manuscript is crucial in dating the *De effectibus qualitatum* and the activity of Urso of Salerno, since Urso's other works are preserved in manuscripts dating from the thirteenth century at the earliest. It should also be noted that Alexander Nequam draws on the *Glosulae in Aphorismos* — Urso's last theoretical work — in his *De natura rerum*, written in around 1200, when Alexander was still teaching theology at Oxford before leaving for Cirencester Abbey in 1202⁹. Alexander Nequam names Urso in his poem *Laus divinae sapientiae*, written in around 1213, but it is far from clear which work by Urso he has in mind — possibly the *De commixtionibus elementorum*¹⁰. The physician Gilles of Corbeil likewise names Urso in his poem *De virtutibus et laudibus compositorum medicaminum*, which dates from the 1190s, while the historian Peter of Eboli also mentions a Doctor Urso in his *Liber ad honorem Augusti sive de rebus Siculis* at around the same time¹¹. Several convergent factors thus indicate that Urso of Salerno was active between the last quarter of the twelfth and the first quarter of the thirteenth century.

8. M. Green, "Rethinking the manuscript basis of Salvatore de Renzi's *Collectio Salernitana*: the corpus of medical writings in the 'long' twelfth century," in D. Jacquart and A. Paravicini Bagliani, eds., *La "Collectio Salernitana" di Salvatore De Renzi. Convegno internazionale Università degli Studi di Salerno, 18-19 giugno 2007* (Florence, 2008), p. 15-60.

9. Alexander Nequam, *De naturis rerum* I, 16, ed. T. Wright (London, 1863). For the quotations from Urso's *Glosulae*, see R. W. Hunt, *The Schools and the Cloister: The Life and Writings of Alexander Nequam (1157-1217)*, edited and revised by M. Gibson (Oxford, 1984), p. 71-72.

10. Hunt, *The Schools and the Cloister*, 7. Alexander quotes Urso's opinion on water in *Laus divinae sapientiae* IV, 232-235, ed. Wright, p. 425: "*Mobilis, humidus est aqueus liquor, insipidusque, / ductilis et fluidus, frigiditate potens. / Obtusus, liquidus, inundans gravis alteritati / parens diaphanus, albet ut Urso docet.*"

11. B. Lawn, *I quesiti salernitani: introduzione alla storia della letteratura problematica medica e scientifica nel Medio Evo e nel Rinascimento*, Italian translation by A. Spagnuolo (Cava dei Tirreni, 1969), p. 50-51.

Urso and Aristotle

D. Jacquart has analyzed the use of Aristotle's writings on natural philosophy in the Salernitan milieu in a number of articles, showing that it amounted to tentative efforts that cannot be said to have paved the way for genuine Aristotelianism. It is difficult to trace the exact provenance of the quotations of Aristotle in the works of the Salernitan physicians, particularly in the case of Urso, who never quotes directly from the Latin translations of the *Libri naturales*¹². The *De commixtionibus elementorum* may be quoting the *Physica*, although no word-for-word correspondence is to be found with James of Venice's Greco-Latin translation or the *translatio Vaticana*. Urso does include sentences from *De generatione et corruptione* in the *De commixtionibus elementorum* and in the *Glosulae in Aphorismos*, but in all probability his direct source was Raoul of Longchamp's *Summa de philosophia* or the works of the physician Maurus of Salerno¹³. The question of Urso's sources is still a matter of scholarly debate.

According to C. Matthaes, Urso drew on book IV of Aristotle's *Meteorologica* to write his *De effectibus qualitatum*. This question

12. D. Jacquart, "Aristotelian thought in Salerno," in P. Dronke, ed., *A History of Twelfth-Century Western Philosophy* (Cambridge, 1988), p. 407-428; Ead., "Minima in Twelfth-Century Medical Texts from Salerno," in C. Lüthy, J.E. Murdoch and W.R. Newman, eds., *Late Medieval and Early Modern Corpuscular Matter Theories* (Leiden-Boston-Köln, 2001), p. 41-56. See Lawn, *I quesiti salernitani*, p. 52. On Urso and Aristotle, see P.O. Kristeller, "La scuola di Salerno. Il suo sviluppo e il suo contributo alla storia della scienza," Italian translation in *Id.*, *Studi sulla scuola medica salernitana* (Naples, 1986), p. 46-48. See also P. Morpurgo, *Filosofia della natura nella schola salernitana del secolo XII* (Bologna, 1990); *Id.*, *L'idea di natura nell'Italia normanno-sveva* (Bologna, 1993).

13. I. Caiazzo, "Discussions sur les quatre éléments chez Alain de Lille et Raoul de Longchamp," in J.-L. Solère, A. Vasiliu and A. Galonnier, eds., *Alain de Lille, le docteur universel: Philosophie, Théologie et Littérature au XI^e siècle. Actes du XI^e Colloque international de la Société internationale pour l'étude de la philosophie médiévale, Paris, 23-25 octobre 2003* (Turnhout, 2005), p. 145-167.

cannot be fully discussed within the scope of the present article, but in the absence of a proper critical edition and a detailed study of this treatise, some preliminary observations on vocabulary can be made. Urso calls the four primary qualities *frigiditas*, *caliditas*, *humiditas* and *siccitas*. Henry Aristippus uses the terms *ariditas*, *aridus* and occasionally *siccitas* for “dryness” in the Greco-Latin translation of book IV of the *Meteorologica* he produced prior to 1160, and he apparently uses *frigidum*, *algidum* or *gelidum* interchangeably for “cold”¹⁴. Urso simply adopts the terminology long in use by the Latins, who knew of Aristotle’s doctrines indirectly well before the translation movement of the twelfth century. For example, Alfano of Salerno’s late-eleventh-century Greco-Latin translation of Nemesius of Emessa’s *De natura hominis* uses the same terminology as Urso to refer to the four qualities¹⁵, as did Isidore of Seville, Johannes Scottus Eriugena, Remigius of Auxerre, and many others. The encyclopedic Latin works of late Antiquity introduced aspects of Peripatetic physics (stripped of their context) to medieval authors, who were rarely in a position to grasp all the implications of such

14. Henry Aristippus’s translation is published at the bottom of the page in the *editio Coloniensis* of Albert the Great’s commentary on the *Meteorologica*. See Albertus Magnus, *Meteora*, ed. P. Hossfeld (Münster, 2003). The beginning of Henry Aristippus’s translation was published by F. H. Fobes, “Medieval versions of Aristotle’s *Meteorology*”, in *Classical Philology*, 10 (1915), p. 310-311. See E. Rubino, “Il IV libro dei *Meteorologica* di Aristotele tra filosofia e filologia,” in A. Beccarisi, R. Imbach and P. Porro, eds., *Per perscrutationem philosophicam. Neue Perspektiven der mittelalterlichen Forschung. Loris Sturlese zum 60. Geburtstag gewidmet* (Hamburg, 2008), p. 15-31. Since I have written the present article, a new edition of book IV has become available: *Meteorologica*, liber quartus. *Translatio Henrici Aristippi*, ed. E. Rubino, *Aristoteles latinus X*, 1 (Turnhout, 2010).

15. Nemesius of Emessa, *Premnon physicon a N. Alfano archiepiscopo Salerni in latinum translatus*, 5 (*De elementis*), ed. C. Burkhard (Leipzig, 1917), p. 63: “Necessesse est igitur esse elementum corpus et simplex corpus et secundum actum habens extremas qualitates, dico autem caliditatem, frigiditatem, humiditatem et siccitatem.”

complex theories. Moreover, Aristotle constructed his theory of the four elements to counter the teachings of the *Timaeus*, while the authors of late Antiquity, and later their medieval successors, sought to reconcile Plato and Aristotle, smoothing over their differences. In particular, they strove to achieve *symphonia* on the issue of the qualities of the elements, as will be shown in the present article.

“*Toward the center or from the center*”:
Was Urso a reader of De caelo?

W. Stürner considers that some passages from the *De commixtionibus elementorum* on the motion of the elements might be inspired by *De caelo*. Much research remains to be done on the reception of this Aristotelian treatise in the West, as translated from the Arabic by Gerard of Cremona¹⁶.

It was long thought that the Salernitan physicians were unfamiliar with the translations from the Arabic produced in twelfth-century Spain, having access only to the eleventh-century Arabic-Latin translations by Constantine the African and to the Greco-Latin translations of Aristotle. It has been demonstrated, however, that they knew Burgundio of Pisa’s Greco-Latin translations of Galen. Similarly, Bartholomaeus of Salerno quotes Qusṭā ibn Lūqā’s *De differentia spiritus et animae*, translated from the Arabic by John of Seville in the first half of the twelfth century. In around 1170, Magister Salernus wrote a summary of the *Meteorologica* based on the *translatio vetus* — the first three books translated from the Arabic by Gerard of Cremona, book IV translated from the Greek by Henry Aristippus, and an extract from the section on meteorology in Avicenna’s *Shifā, De mineralibus*, translated by Alfred of Sareshel¹⁷. Gerard of Cremona’s translation of *De caelo*

16. See Peter of Auvergne, *Questions on Aristotle’s De caelo. A Critical Edition with an Interpretative Essay by Griet Galle* (Leuven, 2003), p. 24*-44*: “The Reception of *De caelo* in the Thirteenth Century”.

17. This is the earliest known evidence of the availability of the Latin translation of the Arabic version of the *Meteorologica*: see M. Ausécache,

does not seem to have stirred much interest in the twelfth century. Does the case of Urso of Salerno shed new light on this issue? Urso's *De commixtionibus elementorum* describes the motion of the elements to and from the center. He explains that fire is substantially hot and accidentally dry; it is light and mobile, with a range of other qualities, and *motum habens de centro*. Air is substantially wet and accidentally hot, and is likewise endowed with numerous other qualities, *motum habens de centro*. Water is substantially cold, accidentally wet, and with other qualities, *motum habens ad centrum*. Earth is substantially dry, accidentally cold, and with other qualities, *motum habens ad centrum*¹⁸. W. Stürner indicates *De caelo* as the source of this passage on the motion of the elements, whose subject was the theory of the natural places of the elements and their motions toward the higher or lower parts of the universe – from the center of the universe toward the periphery, or from the periphery toward the center, according to their lightness or heaviness. In Gerard of Cremona's translation (ca. 1175), the term used is “middle” (*ad medium/de medio*), not “center” (*ad centrum/de centro*)¹⁹. The term “medium” also occurs in the *Liber celi et mundi*, i. e. Gundisalpinus and Iohannes Hispanus's Latin translation (ca. 1150-1175) of Hunayn ibn Ishāq's paraphrase of the first two books of Aristotle's *De caelo*²⁰. The *Liber celi et mundi*, often attributed to Avicenna in manuscript sources, was known to a few scholars in the twelfth

“Magister Salernus dans la *Collectio Salernitana* et au-delà,” in Jacquart and Paravicini Bagliani, *La “Collectio Salernitana”*, p. 191-226.

18. Urso of Salerno, *De commixtionibus elementorum*, p. 54.

19. Gerard of Cremona's translation is edited by I. Opelt at the bottom of the page in the *editio Coloniensis* of Albert the Great's commentary on the *De caelo*: Albertus Magnus, *De caelo et mundo*, ed. P. Hossfeld (Münster, 1971).

20. Pseudo-Avicenna, *Liber celi et mundi*, ed. O. Gutman (Leiden-Boston, 2003), p. 18: “*Invenimus etenim motum omnis corporis quod est in mundo, aut ad suum medium aut a suo medio aut circa suum medium versari; et motus qui est circa suum medium circularis est. Duo autem motus, qui sunt ad medium et a medio, recti sunt; sed qui sunt a suo medio sunt versus sursum, qui vero ad suum medium sunt versus deorsum.*”

century; it is even acknowledged as the source of some quotations from Aristotle's *De sensu et sensato* and *Physics*. In the first book of the *Meteorologica*, translated by Gerard of Cremona, the movements of the four elements are clearly explained following a reference to the circular motion of the mobile spherical bodies: the four elements move toward the middle or away from the middle²¹. The Greco-Latin translation of Proclus's *Elementatio physica*, also known in Latin as *De motu*, is another example. Its editor H. Boese argued that the translation was probably produced in Sicily by the same individual who translated Ptolemy's *Almagest* from the Greek. This translator gives us some information about his background in the preface to his version of the *Almagest*. He studied medicine in Salerno and claims to have met Henry Aristippus, who died in 1160. In the *Elementatio physica* the subject is once again the motion of the heavy elements toward the middle (*ad medium*) and of the light elements from the middle (*de medio*)²². Older sources known in the twelfth century, such as Cicero's *De natura deorum* and Priscianus of Lydia's *Solutiones ad Chosroem*, likewise discuss the motion of elements toward the middle (*medium*) and from the middle, and never from the center.

21. P.L. Schoonheim, *Aristotle's "Meteorology" in the Arabico-Latin Tradition. A Critical Edition of the Texts, with Introduction and Indexes* (Leiden, 2000), p. 6: "*Reliqua vero corpora sunt quattuor corpora, quoniam principia eorum et ipsorum capita primitiva sunt quattuor numero et habent duos motus: motum a medio ad sursum, et motum a sursum ad medium. Corporum autem levium motus est a medio ad sursum, gravium vero ad medium. Et ista quidem corpora quattuor sunt: ignis et aer et aqua et terra. Ignis autem est levior eorum et superior eis in loco, et terra est gravior eorum et inferior eis in loco, aqua autem et aer — duo elementa reliqua continua cum istis duobus elementis — sunt media inter ea.*"

22. *Die mittelalterliche Übersetzung der Stoikheîōsis Phusikê des Proclus. Procli Diadochi Lycii Elementatio physica II, VIII-IX. II, 3, ed., H. Boese, (Berlin, 1958), p. 46 and 48. On the anonymous translator of *Almagest*, see J.E. Murdoch, "Euclides Graeco-Latinus: a hitherto unknown medieval Latin translation of the *Elements* made directly from the Greek", *Harvard Studies in Classical Philology*, 71 (1967), p. 249-302.*

It might be thought that referring to the “middle” or “center” amounts to the same thing. Martianus Capella, for instance, explains the word *medium* by the word *centron*²³. However, these allusions to the center of the universe echo the famous passage from the *Timaeus* 62c-63e, where Plato begins by defining “up” and “down” to explain “heavy” and “light”. These terms seem to him to be inaccurate in describing the universe, and he therefore prefers to refer to the extremities and center (*centron*) of the universe²⁴. Yet as far as is known, this part of the *Timaeus* was not available to medieval Latin authors. Galen wrote a commentary on the medical parts of the *Timaeus* (from 41d or 42e to 92c), of which only the fragment dealing with 76d-80c is preserved in Greek, as well as a *Synopsis* of all Plato’s dialogues. All that has survived of this *Synopsis* is the section on the *Timaeus* in Hunayn ibn Ishāq’s ninth-century Arabic version. These works by Galen were not available to medieval Latin authors. To simplify, it can be stated that “middle” (*meson*) is a term used by Aristotle, while “center” (*centron*) is used by Plato.

A faint echo of the discussion over “center” vs. “middle” is found in the *Liber Marii de elementis*, a treatise composed, according to its editor, by a certain Marius in the latter half of the twelfth century. Marius writes that heaviness makes the water and the earth move toward the center, and that physicists call this “motion toward the

23. Martianus Capella, *De nuptiis Philologiae et Mercurii* 8.814, ed. I. Ramelli (Milano, 2001), p. 580-582: “Mundus igitur ex quattuor elementis isdemque totis in sphaerae modum globatus terram in medio imoque defixam [...]” *Ibid.*: “[...] quarum circa medium, quod dixerent centron, aquae primum aerisque sequens, [...]”

24. *Tim.* 62c; English translation in D. O’Brien, *Theories of Weight in the Ancient World. Four Essays on Democritus, Plato and Aristotle. A Study in the Development of Ideas.* II. *Plato: Weight and Sensation. The Two Theories of the Timaeus* (Leiden, 1984), p. 42: “The parts of whole that are set out from the centre an equal distance, and that are thereby established as extremities, must needs be constituted by nature as all to the same degree and in the same sense extreme. The centre is set away the same distance from the extremities, and must therefore be reckoned as in the opposite position to them all [...]”

middle”²⁵. In another passage, Marius affirms that air moves upwards (as can be seen in steam) while that of fire moves toward the center (as can be seen in flames). *Physici* refer to the latter as “*motus de medio*”²⁶. The identity of the *physici* referred to by Marius remains a mystery, since in the twelfth century the term “*physicus*” meant either a doctor or a philosopher of nature. Whatever their identity, however, the key point is that Marius distinguishes between those who refer to the center and those who refer to the middle.

Urso of Salerno, like his contemporaries Raoul of Longchamp, Maurus of Salerno and Daniel of Morley, refers to motion toward the center or from the center, not the “middle”²⁷. It is hard to

25. Marius, *On the Elements. A Critical Edition and Translation by Richard C. Dales* (Berkeley, 1976), p. 47: “*Quae etiam ponderositas et terram et aquam moveri facit ad centrum; quem motum vocant phisici ‘motum ad medium’.*” Scholars disagree on the date and paternity of the *Liber Marii de elementis*. In an unpublished dissertation, J. Reuter-Beaumont, following a suggestion by R. Hunt, maintains that the author is Petrus Alfonsi, who wrote the *De elementis* using Arabic sources available in Spain in the first half of the twelfth century: see J. Tolan, *Petrus Alfonsi and his Medieval Readers* (Gainesville, 1993), p. 205-208. M.-T. d’Alverny accepts this attribution in her article “Pseudo-Aristotle, *De elementis*,” in J. Kraye, W.F. Ryan and C.B. Schmitt, eds., *Pseudo-Aristotle in the Middle Ages: the Theologia and Other Texts* (London, 1986), p. 63-83. See also C. Burnett, “The works of Petrus Alfonsi: questions of authenticity,” *Medium Aevum*, 66 (1997), p. 42-79.

26. Marius, *On the Elements*, p. 55: “*De motu autem isto, dicunt phisici, quia est ‘motus de medio’.*”

27. Daniel of Morley, *Philosophia*, ed. G. Maurach, *Mittelateinisches Jahrbuch*, 14 (1979), p. 226-227. Maurus of Salerno’s commentary on *Isagoge Iohannitii* and Raoul of Longchamp’s *Summa de philosophia* has yet to be published: see Caiazzo, “Discussions sur les quatre éléments,” p. 145-167. On Maurus, Raoul and Daniel, see the pioneering article by A. Birkenmajer, “Le rôle joué par les médecins et les naturalistes dans la réception d’Aristote au XII^e et au XIII^e siècle,” in *La Pologne au VI^e Congrès international des Sciences historiques, Oslo 1928* (Varsovie, 1930), p. 1-15. On Daniel, see T. Ricklin, “Die lateinische Entdeckung

establish clear patterns of influence between these authors, since they all wrote in the latter half of the twelfth century, and the dates of composition of their works are not known with any precision. However, the chapter on the qualities and motions of the elements in Maurus of Salerno's commentary on the *Isagoge Iohannitii* is very close to Urso of Salerno's *De commixtionibus elementorum*²⁸. Maurus therefore seems to be the direct source for Urso.

In fact, a preliminary inquiry in twelfth-century works on natural philosophy and cosmology suggests that William of Conches was the first author to refer to the motion of the elements toward the center or away from the center of the universe, in his *Dragmaticon philosophiae*, written in ca. 1147-1149, during his time at the Plantagenet court as tutor to the future Henry II of England. William of Conches's earlier works had discussed the place of the elements in the universe in terms of layers (earth, water, air, fire), but had not explained their motion within the universe. William of Conches includes these considerations on the directions of the elements when distinguishing natural from accidental motion. He explains that when an external cause pushing water and earth ceases its action, the two elements return toward to the bottom in accordance with their natural motion. He further adds some observations on fire, which, being the element situated at the very top of the universe, finds itself unable to move any further upwards and therefore cannot exert its natural motion, which pushes it away from the center. In spite of this, fire does not descend toward the center, which would be a motion against its nature. The editor of the *Dragmaticon philosophiae* points

der Quintessenz: die *Philosophia* des Daniel von Morley", in A. Niederberger, A. Fidora and M. Lutz-Bachmann, eds., *Metaphysics in the Twelfth Century: on the Relationship among Philosophy, Science and Theology* (Turnhout, 2004), p. 85-112.

28. Maurus of Salerno, *Commentary on Isagoge Iohannitii*, ms. Paris, BnF, lat. 18499, f^o 6vb: "Ignis est corpus simplum, in summo calidum, ... motum habens de centro; aer est corpus simplum, in summo humidum, ... motum habens de centro; aqua est corpus simplum, in summo frigidum, ... motum habens ad centrum; terra est corpus simplum, in summo siccum, ... motum habens ad centrum."

to Macrobius's *Commentarii in Somnium Scipionis* II,14 as the source of this passage, as Macrobius's discussion of the soul and its ability to move itself by itself mentions the motions of the lower elements downward and of the higher elements upward. Macrobius does not, however, refer to the center of the universe²⁹. William of Conches's own glosses on Macrobius's *Commentarii* do not expand upon chapter II, 14, and his remarks deal with the main subject of the chapter: the motions of the soul.

The references to the center of the universe introduced by William in the *Dragmaticon philosophiae* seem to draw on the terminology used in astronomy and geometrical constructions of *figurae*, such as Māshā'allāh's *Liber de orbe*, where the word *centrum* refers to the center of the figure representing the motions of the elements toward the middle (*ad medium*) or away from the middle (*de medio*)³⁰. In his *Dialogi contra Iudaeos*, Petrus Alfonsi inserts a

29. William of Conches, *Dragmaticon philosophiae* II, 5, ed. I. Ronca, CCCM 152 (Turnhout, 1997), p. 50: "*Duo igitur inferiora elementa ad centrum moventur, duo superiora a centro. Hoc autem ex partibus eorum probari potest. Nulla enim est pars terrae vel aquae quae, si aliqua causa subleuetur, cessante causa non descendat; et quantum terra gravior est aqua, tanto in hoc motu est velocior;*" *ibid.*: "*Ignis igitur, qui naturaliter a centro est mobilis, a centro tamen non movetur. Cum enim nullus locus supra ipsum est, ascendere non potest. Nulla vero specie translationis movetur: descendere non potest, quia hoc est ad centrum moveri, quod est contra eius naturam [...]*." I. Ronca argues that the source is Macrobius, *Comm. in Somnium Scipionis* II, 14.12-13: "*Natura vero moventur vel gravia cum per se deorsum, vel levia cum sursum feruntur; sed et haec dicendum est ab alio moveri, licet a quo habeatur incertum. Ratio enim, ait [scilicet Aristoteles], deprehendit esse nescio quid quod haec moveat. Nam si sponte moverentur, sponte etiam starent, sed nec unam viam semper agerent, immo per diversa moverentur si spontaneo ferrentur agitatu. Cum vero hoc facere non possint, sed levibus semper ascensus, et descensus gravibus deputatus sit, apparet eorum motum ad certam et constitutam naturae necessitatem referri.*" In this chapter, Macrobius translates passages from Aristotle, *Phys.* VIII, 4.

30. I am grateful to Barbara Obrist for her suggestions and for bringing Māshā'allāh to my attention. See her article, "William of Conches, Māshā'allāh and twelfth-century cosmology," in *Archives d'histoire doctrinale et littéraire du*

figura in which the earth is the center of the universe, but there is no indication of the motion of the elements³¹. However, it is clear that the motions of the elements in relation to the “center” play different roles in Urso’s *De commixtionibus elementorum* and William of Conches’s *Dragmaticon philosophiae*. The latter briefly discusses the issue in a cosmological context, while Urso constantly draws on the motions of the elements, conceived as centripetal or centrifugal forces, to explain the formation and transformation of bodies made up of elements. Without wishing to over-simplify the argument, the motion of the elements in William of Conches’s macrocosm can be said to find a counterpart in Urso of Salerno’s microcosm.

De commixtionibus elementorum

The *De commixtionibus elementorum* is not an abstract treatise on the four elements. Rather, it is a description of the transformations — generation and corruption — of the *elementata* or things made up of the elements, with an attempt to identify the theoretical principles governing these transformations. Providing the key to the interpretation of the *De commixtionibus elementorum* within the scope of an article is quite a challenge, as is identifying sources clearly and unambiguously³². Bearing these difficulties in mind,

Moyen Âge, 76 (2009), p. 29-87. For a fuller discussion of William of Conches’s sources on the motion of the elements, see I. Caiazzo, “The four elements in the work of William of Conches,” in B. Obrist and I. Caiazzo, eds., *Guillaume de Conches : philosophie et science au xii^e siècle* (Firenze, 2011), p. 3-66.

31. Petrus Alfonsi, *Dialogi contra Iudaeos*, PL 157, c. 548. The *figura* is reproduced in Tolan, *Petrus Alfonsi*, p. 54.

32. In addition to the aforementioned contributions by D. Jacquart, see T. Ricklin, “Conceptions of time in twelfth-century Salernitan medicine”, in P. Porro, ed., *The Medieval Concept of Time. Studies on the Scholastic Debate and its Reception in Early Modern Philosophy* (Leiden-Boston-Köln, 2001), p. 437-458; W. Stürner, *Natur und Gesellschaft im Denken des Hoch- und Spätmittelalters* (Stuttgart, 1975), p. 48-55, and B. Pabst, *Atomtheorien des lateinischen Mittelalters* (Darmstadt, 1994), p. 202-210. See also Z. Kaluza, “La notion de matière et son

I now turn to an analysis of the concept of *yle* or prime matter, which Urso discusses in the *De commixtionibus elementorum* and nowhere else.

The creation of yle

Following the prologue of *De commixtionibus elementorum*, in which Urso discusses his work and the reasons that led him to write, the first chapter begins with a discussion of *yle* extending over several pages. According to Urso, the “ancient doctors” (a very ambiguous formulation) held that all corporeal things are governed by a three-fold principle: *opifex*, *materia* and *forma*. Urso then enumerates the functions of this threefold principle. The *opifex* – a term borrowed from Calcidius – is the effective extrinsic unmoved principle from which (*a quo*) things have their origin in a causal way. Matter is the intrinsic principle, with motion, from which (*a quo*) things receive being in an absolute (*simpliciter*) and indeterminate way. Form is the formal principle from which (*ex quo*) specific being is attributed to things; things are distinguished from each other by means of the impression of various forms and are specified in various manners (*maneries*)³³. Both matter and form derive from the *opifex*, who is the *causa causalissima*: matter derives from his will through his power, and form promotes the union of the *opifex* and of matter³⁴.

évolution dans la doctrine wyclifienne”, in M. T. Fumagalli Beonio Brocchieri and S. Simonetta, eds., *John Wyclif: Logica, politica, teologia. Atti del Convegno Internazionale Milano, 12-13 febbraio 1999* (Firenze, 2003), p. 113-151, Appendice 2: “Wyclif et Urso de Salerne”.

33. Urso uses the term *maneries*, apparently coined by Abelard and in widespread use in the twelfth century. See J. Jolivet, “Notes de lexicographie abélardienne”, in R. Louis, J. Jolivet, Jean Châtillon, eds., *Pierre Abélard et Pierre le Vénéral. Les courants philosophiques, littéraires et artistiques en occident au milieu du XI^e siècle – Abbaye de Cluny, 2 au 9 juillet 1972* (Paris, 1975), p. 531-543.

34. Urso of Salerno, *De commixtionibus elementorum*, p. 39-40: “*Ut veterum medicorum communis edocet assertio, omnium corporearum rerum triplex extitit principium, scilicet opifex, materia et forma. Opifex effectivum principium extrinsecus sine motu, a quo suam res causaliter traxere originem, materia intrinsecus*

This process of the creation of matter and form by emanation is similar to that described in Gundissalinus's *De processione mundi*³⁵, written in the 1160s.³⁶ Gundissalinus was influenced by the philosophical system of Ibn Gabirol (Avicebron to the Latins), having translated his *Fons vitae* into Latin, and, as a reader of Hermann of Carinthia's *De essentiis*³⁷, he evokes three principles: God, matter, and form. Urso likewise refers to "form" in the singular, whereas Platonists in the Latin tradition generally refer to forms (plural), or to eternal idea-archetypes. Moreover, at the very beginning of his *Hexaemeron*, Ambrose of Milan criticizes Plato and his follow-

fuit principium et cum motu, a quo res contrahunt simpliciter esse et indeterminate. Forma formale fuit principium, ex quo rebus specificatum esse est inditum; variarum namque impressione formarum res ad invicem discrete sunt et per varias specificate maneris. Ab opifice vero tamquam a causa causalissima reliqua duo derivata defluerunt, materia iuxta eius voluntatem per sui potentiam, forma vero pro consortio potestatis. In principio enim creavit deus ex nichilo quandam rudem et primeriam materiam omnium corporum genitricem, quam silvam vel ylem appellaverunt philosophi, que nec fuit corporea nec incorporea."

35. Gundissalinus, *De processione mundi* 43, ed. C. Alonso del Real Montes and M.J. Soto Bruna, *De processione mundi: Estudio y edición crítica del trabajo de Domingo Gundisalvo* (Pamplona, 1999), p. 194: "Creatio namque rerum a creatore non est nisi exitus formae ab eius sapientia et voluntate; et impressio eius in imaginem in materiam ad similitudinem aquae exitus emanantis a sua origine et effluxio eius, cum una sequitur post aliam." Following G. Bulow, the editors give the source of this passage as Ibn Gabirol, *Fons vitae* 5, p. 330-331. W. Stürner points to *De processione mundi* as a source of this chapter of Urso's *De commixtionibus elementorum*.

36. The *terminus post quem* of the text's composition may be established by means of the date of Abraham Ibn Daud's work *Sublime Faith* (ca. 1160/1161), which Gundissalinus uses in *De processione*. See A. Fidora, "Le débat sur la création : Guillaume de Conches, maître de Dominique Gundisalvi?"; in Obrist and Caiazzo, *Guillaume de Conches*, p. 271-288.

37. C. Burnett, "The blend of Latin and Arabic sources in the metaphysics of Adelard of Bath, Hermann of Carinthia, and Gundisalvus," in Niederberger, Fidora, Lutz-Bachmann, *Metaphysics in the Twelfth Century*, p. 41-65.

ers for having held that at the origin of cosmos there were three principles: *deus*, *exemplar*, *materia*³⁸. Urso may very well have been familiar with these three ‘platonian’ principles through Ambrose’s *Hexaemeron* and through medieval *Genesis* commentaries.

It is however far more likely that Urso drew upon Gundissalinus who, in his *De processione mundi*, describes the formal principle as an *ex quo* and the material principle as an *in quo*. As to Urso, he has a marked preference for the formula *a quo* with regard to matter. This choice is indicative of Urso’s understanding of matter in terms of potentiality rather than of place or receptacle in which things are generated. Furthermore, he does not refer to ideas or forms (the two are synonymous for the Latins) as exemplary models of sensible things. Urso is thus more Aristotelian than Platonic. The ‘extrinsic’ and ‘intrinsic’ principles are mentioned in other Salernitan texts, such as the divisions of philosophy set forth in the *accessus* to the commentaries of Archimatheus, Bartholomaeus and Maurus of Salerno on the *Isagoge Iohannitii*³⁹.

38. Ambrose of Milan, *Hexaemeron* I, 1, PL 14, c. 133-134.

39. On these authors, see P. O. Kristeller, “Bartholomaeus, Musandinus and Maurus of Salerno and other early commentators of the *Articella*, with a tentative list of texts and manuscripts,” *Italia medioevale e umanistica*, 19 (1976), p. 57-87, Italian translation in *Id.*, *Studi sulla scuola medica salernitana*, p. 97-151; M. D. Jordan, “Medicine as science in the early commentaries on ‘*Johannitius*’,” *Traditio*, 43 (1987), p. 121-45; *Id.*, “The construction of a philosophical medicine. Exegesis and argument in Salernitan teaching on the soul,” *Osiris*, 6 (1990) p. 42-61; F. Wallis, “The *Articella* commentaries of Bartholomaeus of Salerno,” in D. Jacquart and A. Paravicini Bagliani, eds., *La scuola medica salernitana. Gli autori e i testi* (Firenze, 2007), p. 125-164. The commentary of Archimatheus is the only one available in an electronic edition: *Archimathei Salernitani Glossae in Isagogas Johannitii. Ein Kursus in mittelalterlicher Physiologie nach dem Codex Trier Bischöfliches Priesterseminar 76A und dem Codex Toletanus Archivio y Bibliotheca Capitulares 97-14*, ed. H. Grensemann (Hamburg, 2004). On the division of philosophy, see D. Jacquart, “*Theorica et practica* dans l’enseignement de la médecine à Salerne au XI^e siècle,” in O. Weijers, ed., *Vocabulaire des écoles et des méthodes d’enseignement au Moyen Âge* (Turnhout, 1992), p. 102-110.

Maurus distinguishes a *principium extrinsecus sine motu* (God), a *principium extrinsecus cum motu* (the planets), and a *principium intrinsecus* (nature). He introduces these three principles in the context of the division of knowledge explaining that metaphysics studies the extrinsic principle that does not move, mathematics studies the extrinsic principle that moves, and physics studies the intrinsic principle⁴⁰. The expressions *sine motu / cum motu*, also present in these Salernitan texts, derive ultimately from the division of the sciences set forth in Boethius's *De Trinitate*. This division was the subject of speculation in the twelfth century, particularly in the works of Gilbert of Poitiers, Thierry of Chartres, and Clarembald of Arras, who commented on *De Trinitate*, and in Gundissalinus's *De divisione philosophiae*. It should be noted that the latter uses the expressions *sine motu/ cum motu*, whereas Boethius uses *sine motu/in motu*⁴¹. Furthermore, while Boethius refers *sine motu* to the object of both *theologica* and *mathematica*, Gundissalinus attributes *sine motu* exclusively to the object of *theologia*. These distinctions are applied to the first two principles in Urso's *De commixtionibus elementorum*: the *opifex* is extrinsic and without motion, while matter is intrinsic and with motion. It is not stated clearly whether form is an intrinsic or extrinsic principle, with or without motion. Like Maurus of Salerno then, Urso seems to be indebted to Gundissalinus's, rather than Boethius's division of the sciences⁴².

40. Maurus of Salerno, *Commentary on Isagoge Iohannitii*, ms. Paris, BnF, lat. 18499, f^o 1va-b.

41. Gundissalinus, *De divisione philosophiae*, ed. L. Baur (Münster, 1903), p. 15; Boethius, *De Trinitate* 2.

42. In the *Glosulae in Aphorismos*, Urso mentions the *principium effectivus* (the maker) only once in passing, and the other two not at all. See *Glosula* 1, ed. Creutz, p. 19: "*Perspicuae rationi patet fidelium, quod universarum rerum unum et invariabile manet principium effectivum, cuius admirabili potentia visibilia et invisibilia sunt condita universa, eisque inscrutabili sapientia conditas formas et virtutes varias inseruit prout voluit.*"

After discussing the flux of the second and third principle from the first, Urso states that in the beginning God created the formless prime matter *ex nihilo*. Philosophers call this matter, generative of all bodies, *yle* or *silva* (a term that occurs nowhere else in the *De commixtionibus elementorum*); it is neither corporeal nor incorporeal. There follows a long description of the attributes of *yle*. *Yle* is not a substance, since it is not subject (*subiecta*) to accidents. It is non-corporeal; Plato described it as being without quantity, form, place, or time, between substance and no substance (*inter aliquam et nullam substantiam*). Urso details these various attributes, drawing on the distinction between potentiality and actuality, which enables him to expound a coherent argument on the characteristics of prime matter. *Yle* is without quantity since it is neither in actuality nor in existence quantified or determined (*dimensa*) by the three dimensions. However, *yle* has the potentiality (*potestas*) to be quantified and subject to the three dimensions, and it is transformed into the four elements by means of the first power (i.e. the *opifex* who activates the process, as Urso explains in the continuation of his account), thereby becoming determined in actuality and in power⁴³. *Yle* is without form and has no quality in actuality, but it is endowed with all the forms; it has the potentiality to acquire qualities and to transform into the four elements. According to Urso, Plato refers to the fact that *yle* has neither quantity nor form nor figure in actuality, but only in potentiality, when he states that “we cannot imagine its form, since it does not seem to have a form, and at the same time all forms seem to be within it because of the transformation of forms into one another” (*Tim.* 52c).

43. Urso of Salerno, *De commixtionibus elementorum*, p. 40: “Non enim erat substantia, cum accidentibus non esset subiecta, fuit tamen quoddam non corporeum, quam Plato, philosophorum summus, sine quantitate, sine forma, sine loco, sine tempore, inter aliquam et nullam substantiam extitisse asseruit. Sine quantitate fuit, quia actu vel existentia nec erat aliquod quantum nec quanta nec tribus dimensionibus dimensa; potestate tamen sola et quantum erat et tribus dimensionibus subiecta, qua prima potentia transiit in quatuor elementa, actu et potestate dimensa.”

Urso includes a further quotation from the *Timaeus* in which Plato explains that “like the bosom of the receptacle, *yle* has no defined figure, and it is because of this lack of form that it is thought to have no form at all” (*Tim.* 50c). Likewise, there is no adversity in *yle*, since adversity and diversity are present only in power and not in act; however, these various *potestates* will end up as diverse and adverse elements. Urso draws on quotations from *Physics* I, 9, taken from Calcidius’s commentary on the *Timaeus*, to explain that this is why Aristotle, having noted the absence of these characteristics in act and the presence of the potentialities of these characteristics, calls *yle* “*caentia et possibilitas*”, since no accident is in act in it, but all are present in power⁴⁴. Similarly, *yle* may be described as neither simple nor compound in act, but it is compound in power, since it is transformed into the four elements which, in their turn, are compound both in act and in power.

Yle has no place, for it has no dimensions in act, and therefore cannot be circumscribed in act in a place, since place has dimensions; it has only the potentiality of being in a place. Nor is there any time in it, since time is the “change of changeable things”, and change in things is possible on the basis of a conflict between qualities; there is no conflict between qualities in *yle* precisely because the opposition between qualities is not in act but only in potential. It is interesting to note that Urso uses a definition of time widely quoted in the twelfth century — “*tempus est motus et dimensio rerum mutabilium*”⁴⁵ — and that he replaces the term *motus* par *mutatio*, the latter being one of the six kinds of motion listed by Aristotle

44. *Ibid.*, p. 41: “*Et propterea Aristoteles considerans in ea absentiam actus predictorum et presentiam potestatum eorundem, eam vocat caentiam et possibilitatem, quia et omnibus caruit accidentibus actu et possibilitate nullis, qua potentia transit in diversa diversis accidentibus subiecta.*”

45. This is the “general” definition of time given by William of Conches in his *Glosae super Platonem*, ch. 94. The same definition is found in the *Glosae super Boetium*, the *Glosae super Macrobius* and the *Glosae super Priscianum*.

in the *Categories* (*secundum locum mutatio*)⁴⁶. However, while Aristotle refers to change according to place, Urso links change in things to change in qualities.

Urso then explains why it may be stated, following Plato, that *yle* is *inter aliquam et nullam substantiam* (*Tim.* 52c). *Yle* is not a substance because it does not support accidents in act. Nor, however, is it nothing, since it has the capacity of becoming a substance and supporting accidents⁴⁷. This leads Urso to speculate that *yle* is a kind of matter in potential, made fruitful by the powers of all bodies and all their accidents, which is why Aristotle affirms that “*yle* is potentially all that derives from it”⁴⁸. Although this is clearly a quotation from Aristotle’s *Physics*, it is nevertheless hard to find this exact phrase in the Greco-Latin version by James of Venice or the version known as the *translatio Vaticana*. Urso conceives of a “flexible” *yle* that has no predetermined goal, and is able to transform itself in act both into one body and its contrary⁴⁹, being an “*inordinata rerum iactatio*” (*Tim.* 30a). This passage from the *Timaeus* is often cited by such twelfth-century authors as William of Conches, Thierry of Chartres, and Gundissalinus, who propose various interpretations of it⁵⁰. For Urso, the Platonic “*inordinata*

46. *Cat.* 15a 13-14.

47. Urso of Salerno, *De commixtionibus elementorum*, p. 42.

48. This is none other than the aforementioned quotation from *Physics* IV, 9, noted by D. Jacquart and T. Ricklin. Urso of Salerno, *De commixtionibus elementorum*, p. 42: “*Fuit enim yle potestativa quedam materia fecundata potestatibus omnium corporum et suorum omnium accidentium, unde Aristoteles: Yle potestate est omne id, quod ex ea est.*” See T. Ricklin, *Die „Physica“ und der „Liber de Causis“ im 12. Jahrhundert: zwei Studien mit einer Vorrede von Ruedi Imbach* (Freiburg, 1995), p. 27.

49. Urso of Salerno, *De commixtionibus elementorum*, p. 43: “*Quia ergo nullam habuit yle prefixam potentiam sic transeundi in unum, quod non posset eque transire in suum contrarium, omni corpulentia et qualitate caruit, que si actu haberet, magis in simile sibi quam in suum contrarium transiret.*”

50. On William of Conches’s interpretation of *inordinata iactatio*, see É. Jeuneau, “Du désordre à l’ordre (*Timée* 30a)”, in T. Leinkauf and C. Steel, eds., *Platons Timaios als Grundtext der Kosmologie in Spätantike, Mittelalter und*

iactatio” has no negative connotations and is not associated with primordial chaos: since there are no qualities in act, but only in potential, there are no conflicts or struggle in its midst, in the Ovidian manner.

Urso draws on Calcidius’s commentary on the *Timaeus* for the notions and quotations that serve his argument that matter is in potential and must pass on to act. Although the two terms *potestas* and *actus* can be found in Calcidius, Urso nevertheless seems to develop his own theory, emphasizing the possibility of matter passing to act. Urso repeatedly states this point, and as we have seen, the *potestas* of form, quantity, quality, and time associated with matter are always described in relation to the four elements and to the ability of matter to produce the four elements in act from itself (*a quo*).

Yle and the qualities of the elements

Yle is thus in a peaceful state, having no *prefixa potentia* within itself, until the power of the highest artisan (*summi artificis potentia*) decides, for reasons beyond human understanding, to make the *potestas* contained within *yle* pass into act. The first bodies produced by means of the “application” of forms are the four elements, whose key characteristic is their capacity to be quantified and qualified, to be in a place and in time, and to be both compound and simple, since the parts that compose them are identical⁵¹.

Renaissance/Plato’s Timaeus and the Foundations of Cosmology in Late Antiquity; the Middle Ages and Renaissance (Leuven, 2005), p. 253-263.

51. Urso of Salerno, *De commixtionibus elementorum*, p. 43-44: “*Ex hac autem rudi et inordinata rerum iactantia ordinata et admiranda rerum processit series, dum summi artificis potentia creata eiusque sapientia humanam rationem effugiente soluta, discreta potestatis sensualitate accensa, transeundi desiderio in actum sue potestatis creantis imperio effrenata, sitibunde transitionis fluctuanti iocunditate quasi simplicissima advenientium substantialium accidentaliumque applicatione formarum induta in ea simpla, sensuality et discreta actu prodiit, quibus sola potestate innitebatur, scilicet in quatuor elementa, que cum essent corpora, erant quanta, qualia, localia, temporalia, composita, simpla, partium omnium habentia*

This is where the difficulties begin. Since the elements are in act, they are now less conciliatory, and refuse to unite among themselves due to their different qualities. The element earth does not wish to be transformed into the element water, but nevertheless has some of its parts thus transformed⁵². This is due to the great power of *yle*, which succeeds in shaking the earth. Since the qualities of earth are opposed to those of water, *yle* absorbs the qualities of earth and converts them into the qualities of water, so that the two elements may be linked to one another⁵³. These

identitatem. Que quidem identitas in nullo alio corpore quam in elemento reperitur." Compare with Calcidius, *Commentarius* 316, ed. J. H. Waszink, *Timaeus a Calcidio translatus commentarioque instructus* (London, 1975²), p. 312-313: "*Recta est igitur nostra opinio neque ignem neque terram nec aquam nec spiritum esse silvam, sed materiam principalem et corporis primam subiectionem, in qua non qualitas non forma non quantitas non figura sit ex natura propria, sed virtute opificis haec ei cuncta conexas sint, ut ex his universo corpori et singillatim perfectio et communiter varietas comparetur.*"

52. Urso of Salerno, *De commixtionibus elementorum*, p. 44: "*Inde est, quod similitudine potestatis yles ad elementum, materiei ad materiatum; licet terra elementum omnino actu aque repugnet et quelibet eius pars, cum sint omnino similes, transit tamen in aquam. Si ergo terra nullam in se habens albedinem sed nigredinem, nullam mollitiem sed duritiem, nullam mobilitatem sed immobilitatem, nullam humiditatem sed siccitatem, resistens sua grossa corpulentia et predictis proprietatibus poterit potestate sola transmutari in aquam prorsus qualitibus predictis contrariis subiectam, quanto magis yle omnimoda potestate nullo contradicente actu potuit transduci in quatuor elementa, ut quod potestate obtinebat in progressis ab ea in actum converteretur.*"

53. *Ibid.*, p. 44: "*Huius yles tanta fuit potentia, ut non tantum omnem potestatem habitam in resultantibus ex ea elementis in actum mutaret, sed etiam immediata vicinitate potestatem ex omni actu eisdem ex ea generatis insereret, ut, quia sunt corpora simpla et corruptibilia, corrupta per generantem naturam tamquam materia transitoria transeant in simpla corpora eis similia recta et reciproca generatione vel per materiam permansivam commixta transeant in non simpla corpora, que suarum partium non habent identitatem, cum ex elementis differentibus specie sint constituta.*"

affirmations by Urso, which seem enigmatic at first, may be clarified by a brief excursus on the reception of the Platonic theory of the four elements.

No doubt due to Aristotle's bitter critique, particularly in *De caelo* III, 7-8, most ancient exegetes of the *Timaeus* were unconvinced by Plato's geometrical model, in which qualities simply arose from the geometrical form of the elements. This model categorically excluded earth from the process of reciprocal transformation of the elements⁵⁴. According to Plato, each element is a regular polyhedron: fire is a tetrahedron or pyramid, air an octahedron, water an icosahedron, and earth a cube. The elements also possess qualities arising directly from their geometrical form. For instance, fire, in the form of a pyramid, is mobile, sharp, penetrating, and light; earth, in the form of a cube, is immobile (*Tim.* 55e-57a). The faces of the three polyhedra chosen by Plato for fire, water, and air may be broken down into scalene triangles, while the faces of the cube (earth) are broken down into isosceles triangles⁵⁵. Earth may be broken down

54. On the Greek commentators, see C. Steel, "Proclus' defence of the *Timaeus* against Aristotle's objections. A reconstruction of a lost polemical treatise", in Leinkauf and Steel, *Plato's Timaeus and the Foundations of Cosmology*, p. 163-193, especially p. 185-193: "Simplicius and Proclus in defence of Plato's geometrical doctrine of the elements".

55. Plato also adds a fifth polyhedron, the dodecahedron, which the God used for the final disposition of the All (the reader is told nothing more about this fifth element, which has caused a great deal of difficulty to exegetes of the *Timaeus*). For a detailed analysis of the passages on geometrical forms of the elements, see L. Brisson, *Le Même et l'Autre dans la structure ontologique du Timée de Platon. Un commentaire systématique du Timée de Platon* (Sankt Augustin, 1994²), p. 358-393, *Id.*, "How and why do the building blocks of the universe change constantly in Plato's *Timaeus* (52a-61c)?" in C. Natali and S. Maso, eds., *Plato Physicus. Cosmologia e antropologia nel Timeo* (Amsterdam, 2003), p. 189-205, and *Id.*, "La théorie de la 'matière' dans le *Timée* de Platon et sa critique par Aristote dans la *Physique*", in C. Viano, ed., *L'Alchimie et ses racines philosophiques. La tradition grecque et la tradition arabe* (Paris, 2005), p. 15-35.

by means of the penetrating action of fire, but it cannot be transformed into another element; its triangles can only dissociate and re-associate. In sum, decomposed earth can only produce earth. The portion of the *Timaeus* (55a-57d) in which Plato attributes solids to the elements was not translated by Calcidius, and was therefore unknown to the Latins. In reality, the situation is somewhat more complex.

First of all, representations of these solids are found in some manuscripts of Cassiodorus's *Institutiones*, following an appended text entitled *Excerptum de quatuor elementis*. It should be noted that there is no mention of the Platonic solids in the *Excerptum*, and consequently there is no relation between the text and the *figura* that accompanies it⁵⁶. Another ancient text, Apuleius's *De Platone et eius dogmate*, summarizes the Platonic theory of regular polyhedra, but does not engage critically with the Platonic theory of the four elements⁵⁷.

Matters are quite different in the case of Calcidius. The golden age of imperial Platonism is over and several centuries of Peripateticism and Stoicism have left their mark. Calcidius's *Commentary on the Timaeus* introduces qualities to explain the reciprocal transformation of the four elements. He tackles the issue indirectly, approaching the question of solid three-dimensional bodies in general and the elements in particular in his commentary on *Timaeus* 31, where Plato deals with the generation of the sensible world. Plato first refers to fire and earth, situated at the opposite extremities of the world, before explaining that two other inter-

56. B. Obrist, *La Cosmologie médiévale. Textes et images. I. Les fondements antiques* (Firenze, 2004), p. 284-289, figs. 110 and 111. In this very rare illustration, air is not an octahedron, as the *Timaeus* has it, but a sphere. For a thorough overview of the ancient sources of the physics of the elements, see *ibid.*, p. 227-310. See I. Caiazza, "La forme et les qualités des éléments : lectures médiévales du *Timée*", in *Il Timeo. Eseggesi greche, arabe, latine* (Pisa, 2012), in press.

57. Apuleius, *De Platone et eius dogmate* VII, ed. J. Beaujeu (Paris, 1973), p. 66-67.

mediary elements must be introduced to link these two extremes, thereby creating continuity in the world's body according to the Calcidian principle of "continuous proportion, which the Greeks call *analogia syneches*"⁵⁸. This explanation follows the rules of geometrical proportions: to link two solids, fire and earth, two middle terms must be introduced⁵⁹. Calcidius expounds these passages with the help of *figurae*, only to conclude at the end of this long development that the solids chosen by Plato for earth and fire – the cube and the pyramid – are incommensurable, because they do not have equal angles. The faces of these polyhedra are made up of triangles, some isosceles and some scalene, which prevents a complete and reciprocal transformation of the elements into one another – all the more so since Plato explicitly states that earth is immobile and is not transformed at all. Calcidius is hence obliged to make the case that Plato himself foresaw this difficulty and argued that one may have a similarity not only *in formis et figuris sed etiam in potentiis et qualitibus*⁶⁰. The introduction of three qualities for each element preserves the *ratio continui competentis*, the *analogia* between the parts of the world, which Calcidius considers of particular significance. Thus, fire is subtle, mobile, sharp (*subtilis, mobilis, acutus*), air is subtle, mobile, obtuse (*subtilis, mobilis, obtusus*), water is obtuse, corpulent, and mobile (*obtusa, corpulenta, mobilis*), and earth is obtuse, corpulent, and immobile (*obtusa, corpulenta,*

58. Calcidius, *Commentarius* 18, Waszink, p. 68: "[...] *iuxta rationem continui competentis, quod a Grecis appellatur analogia syneches*".

59. *Comm.* 13-20, *ibid.*, p. 65-71.

60. *Comm.* 21, *ibid.*, p. 71-72: "*Dixit enim [scilicet Plato], si similitudinem non solum in formis et figuris sed etiam in potentiis et qualitibus quaeri oportere, cum ita dixit: 'Cum in tribus sive numeris seu molibus seu potentiis perinde erit medietas imo, quem ad modum summitas medio [Tim. 31c-32a]'. Quare si inter ignem et terram nulla est in specie et velut in vultu similitudo, quaerenda erit in naturis ac qualitibus ipsorum elementorum iuxta quas faciunt aliquid aut patiuntur et in his proprietatibus ex quibus utriusque elementi vis et germanitas apprime designatur.*"

immobilis)⁶¹. These qualities – referred to in passing by Plato, but of central importance in Calcidius – also enable connections to be made between the four elements.

The Platonic doctrine of regular polyhedra is set forth in the chapter on the elements in Nemesius of Emessa's *De natura hominis*, first translated into Latin by Alfanus of Salerno⁶². A partial Latin translation of the chapter on the elements was likewise produced from the Arabic version of Nemesius's treatise in the second half of the eleventh century, but the theory of "triangles" is almost incomprehensible for a reader unfamiliar with *Timaeus* 55a-57d⁶³. Burgundio of Pisa produced a third translation of *De natura hominis* from the Greek in the second half of the twelfth century.

The Platonic theory of regular polyhedra was thus known indirectly, although the influence of this theory on medieval authors has never been studied. It is the theory of the six qualities of the elements, which can ultimately be traced back to the *Timaeus* itself, that was highly popular in the Middle Ages. In his *Commentarii in Somnium Scipionis*, Macrobius introduces a brief exposition on the four elements in its illustration of the power of the number seven. He begins by evoking and (somewhat freely) translating chapter 3i of the *Timaeus*, and subsequently he draws on the four Aristotelian qualities – cold, hot, dry, wet – to demonstrate how links are created between fire and earth before introducing four further qualities (two for each element). The precise sources for this doctrine are difficult to identify, but may still be Aristotle or *Timaeus* 62c: heaviness,

61. *Comm.* 22, *ibid.*, p. 72-73.

62. Nemesius of Emessa, *Premnon physicon* 5, Burkhard, p. 67.

63. For the most recent edition of this text, see C. Burnett, "Physics before the *Physics*: early translations from Arabic of texts concerning nature in MSS British Library, Additional 22719 and Cotton Galba E IV," *Medioevo*, 27 (2002), p. 53-109, and *Id.*, "Verba Ypocratis preponderanda omnium generum metallis: Hippocrates *On the Nature of Man* in Salerno and Montecassino, with an edition of the chapter on the elements in the *Pantegni*", in Jacquart and Paravicini Bagliani, *La scuola medica salernitana*, p. 59-92.

lightness, density, rarity (*pondus, levitas, densitas, raritas* or *tenuitas*)⁶⁴. Macrobius shows no hesitation in combining the Platonic theory of the elements with clearly Aristotelian elements to guarantee the *iugabilis competentia*, or analogy.

In the Latin version by Alfano, Nemesius of Emessa enumerates two Aristotelian qualities for each element, which, in his view, explain the links between the four elements. He also sets forth the Platonic theory of the polyhedra and assigns three qualities to each element, in a form different from that of Calcidius⁶⁵. Following the authors of late Antiquity, Isidore of Seville juxtaposes the four Aristotelian qualities (which he quotes from Ambrose's *Hexaemeron*) and the six Platonic qualities, but without elaborating any theory himself.⁶⁶ Throughout the Early Middle Ages, authors limit themselves to listing the Aristotelian and/or Platonic qualities, with some variations from Calcidius; they praise the connections that ensure continuity between the elements and the various parts of the world on occasion, but they do not appear to question the feasibility of the reciprocal transformation of the elements. It was precisely this doctrinal point which most preoccupied Calcidius, leading him to attribute three qualities to each element.

Calcidius returns to the problem of the reciprocal transformation of the elements in the section devoted to matter, *De silva*, at the end of his *Commentary on the Timaeus*. He introduces the four Aristotelian qualities *frigus, siccitas, humor, calor* before adding a point that is easily overlooked by the casual reader: earth is indeed obliged to transform into other elements, at least slightly. These references to elementary Aristotelian physics occur only

64. Macrobius, *Commentarii in Somnium Scipionis* I, 6, 24-33, ed. M. Armisen-Marchetti (Paris, 2001), p. 29-32.

65. Nemesius of Emessa, *Premnon physicon* 5, Burkhard, p. 68-69.

66. Isidore of Seville, *De natura rerum* XI.1-3, ed. J. Fontaine (Bordeaux, 1960), p. 213-217.

once in his *Commentary*⁶⁷. However, Calcidius considers the reciprocal transformations of the elements to be of major importance, and after setting forth the various opinions on *silva*, he resumes his lemma-by-lemma commentary on the *Timaeus*. This gives him the opportunity to return to the question, explaining that nothing is stable and immutable in the sensible world, and that therefore the changes that may be observed, for instance in fire, pertain to quality and not to substance (*essentia*). The same holds true for the other elements, which transform into one another in a continuous, never-ending cycle (*Comm.* 325). He adds a brief paragraph referring to the geometrical form of the elements, which, he argues, are not to be taken literally. In other words, when Plato refers to fire in the form of a pyramid, he means the igneous part of *silva*. Similarly, the octahedron merely indicates the airy part of *silva*, and so on⁶⁸. Once again, however, Calcidius notes that Plato tried his best to explain how to identify pure *silva* beyond and within sensible

67. Calcidius, *Comm.* 317-318, Waszink, p. 313-314: “*Quod vero sit universi corporis fomes et prima subiectio, facile probatur ex elementorum in se conversione mutua et ex qualitatum inconstanti mutatione. Etenim terra duas habet proprias qualitates, frigus et siccitatem (perinde enim tractemus ad praesens, quasi terra ex aliqua parte in aliud aliquod convertatur elementum). Similiter aqua in duabus qualitibus invenitur, humoris videlicet et frigoris, et est propria qualitas terrae quidem siccitas, aquae vero humor, communis vero utriusque natura frigoris. Cum igitur terra late fusa convertetur aliquatenus in aquam, tunc siccitas quidem eius mutata erit in humorem, frigus vero, quod commune est, perseverat in statu proprio, quia neque etiam tunc est in terra nec iam in aqua: in terra quidem propterea, quia, quod conversum est, desinit esse terra; nec vero in aqua: dum enim mutatur adhuc et convertitur, neque plene mutatum neque perfecte conversum est, ut iam in aquae materiam migrarit. Superest igitur, ut sit uspiam frigus, nec enim potest esse sine eo in quo est; hoc porro nihil esse aliud quam silvam ratio testatur.*”

68. *Comm.* 326, *ibid.*, p. 321: “*Eodem igitur modo nec ignem, qui est pyramidoides, ignem esse respondebimus, sed vel ignitam silvae partem vel igneam qualitatem, nec octaedrum, sed spirabilem silvam, nec icosaedrum nec cubum, sed humectam hanc, terrenam illam silvae soliditatem.*” Calcidius seems close to the explanation provided by Simplicius in his commentary on Aristotle’s *De caelo* (644, 7-11).

bodies (*Comm.* 327). In sum, *silva*, conceived as a receptacle “de quo” rather than as a *chora* “in quo”, allows us to save the phenomena and explain the transformation of earth into other elements.

*From elements to things formed of elements:
the disappearance of yle*

It is not certain that Urso fully grasped Calcidius’s thought on the reciprocal transformations of the elements, but this may not have concerned him. He was interested in explaining the transformations of sensible bodies, or *elementata*. The system envisaged by Urso – no doubt inspired by Gundissalinus’s *De processionem mundi* – comprises three very clear phases: *creatio*, *prima compositio*, and *generatio*. The creation of matter and form leads to the first composition, giving rise to the four elements, then in turn to the *elementata* or mixed elements⁶⁹. Urso specifies that the elements precede the *elementata* in nature and not in time, no doubt echoing the causal, non-temporal origin of the world set forth in Calcidius’s *Commentary on the Timaeus* and followed fairly widely by twelfth-century authors. The first composition thus gives rise to the four elements. These are in fact *elementata*, or mixed elements, since, according to Urso, each element contains the other three elements, and owes its name to the fact that it forms the majority. For example, earth is called thus because it contains more earth than fire, water, or air⁷⁰. The transformation

69. Urso of Salerno, *De commixtionibus elementorum*, p. 46: “*Et propterea hec quatuor sunt in prima compositione, quia non per generationem ut cetera elementata, sed per solam compositionem primam elementorum suum esse ingressa sunt. Ex quibus elementata alia plura et varia generata sunt per varium elementorum commixtionis modum secundum quod de uno elemento magis vel minus vel tantundem quam de suo contrario venit in commixtione.*”

70. *Ibid.*, p. 44-45: “*Elementa ex yle tamquam ex una radice producta licet natura precessissent elementata, non tamen tempore. Nam et ingrediendo in esse multiplici proportionem et necessaria ad novas et varias corporum species producendas illico commixta et sese miscendo inviolabiliter in esse ingressa sunt nec immerito, cum*

from pure to mixed element, the *elementatum*, may be conceived as outside time, since the components of the mixed element can only be dissociated by the intellect. This mixed element, dissociable by the intellect but indissociable in reality, constitutes the sensible world and gives rise to bodies in its turn. Generation is the transformation of one *elementatum* into another *elementatum*, the only process observable in the sensible world: there can be generation only where there is corruption. The transformation from a corrupted *elementatum* to a newly engendered *elementatum* is immediate and continuous⁷¹.

Urso never returned to the issue of *yle* or prime matter, nor to matter as the *subiectum* of accidents, either in the *De commixtionibus elementorum* or in his other works. Urso, who may have read Aristotle's *De generatione et corruptione*, created a system in which there is no longer any place for the *hypokeimenon*: the corrupted *elementata* are instantly transformed into other *elementata*, without returning to matter, whether conceived as a passive substrate or as a power. Without matter, the true species of the elements can scarcely be understood in terms of bodies, as Aristotle argued after the corruption of an *elementatum* and before the generation of another *elementatum*⁷². Urso proposes a world without *yle*, a world

quodlibet elementum in tribus elementis differentibus specie aliquid sibi simile vel similia inveniat."

71. *Ibid.*, p. 47: "Sic ergo nichil est medium inter corruptionem, qua elementum sive elementatum egreditur esse, et generationem, qua elementum sive elementatum ingreditur esse, cum statim, quod unum desinit esse, in instanti continuo et sine temporis intervallo aliquo alterum incipit esse. Ita nichil est medium inter destructionem commixtionis elementorum componentium elementatum, quod esse egreditur, et constructionem nove commixtionis elementorum constituentium elementatum, quod suum esse ingreditur."

72. *Ibid.*, p. 47: "Unde Aristoteles: 'Vera species elementorum in solis terminis corporum reperitur.' Nam cum corpus duplici claudatur termino, fine scilicet et principio, elementa ultimo in elementati unius corruptione, eademque prima in alterius elementati generati compositione inveniuntur." On this "Aristotelian" quotation by Urso, see Jacquart, "Aristotelian thought in Salerno".

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in which there are only *elementata* ceaselessly transforming into one another. He tries to understand the rules of these transformations with a practical aim in mind: to restore the lost balances of diseased bodies.

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