Scientia in Twelfth Century Philosophy in the Latin West

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Abstract

This thesis a study of the notion of *scientia* in thinkers of the Latin West in the twelfth century. *Scientia* is a Latin word that has served to refer to important conceptions of science. Important in medieval philosophy is its use as the translation of the Greek word ἐπιστήμη, which captures Aristotle's conception of science and that becomes very important in the thirteenth century. I explore the precursor to that notion of *scientia* in works before and immediately after the first translations of the scientific works of Aristotle. The notion in question, more or less developed in the different authors and linked to an educational environment marked by the liberal arts and dialectics in particular, is shown to be generally based in views expressed mainly by Augustine and Boethius. *Scientia* is construed mostly as theoretical, spiritual knowledge that is a necessary step in the quest for the ultimate intellectual state of wisdom (*sapientia*). Hugh of St. Victor is the thinker with the most sophisticated account of *scientia* in this period; his views are shown to be tightly integrated into an overall conception of knowledge as purification of being. Thinkers already in contact with Aristotle's scientific works have accounts that even though informed by new texts, still are found to be working roughly with the same base conception.

Cette thèse est une étude de la notion de *scientia* chez certains penseurs occidentaux du douzième siècle. Le mot *scientia* a été utilisé pour désigner diverses conceptions de la science. Dans la philosophie médiévale, il traduit le mot grec ἐπιστήμη, qui forme le centre de la conception aristotélicienne de la science, et dont l'importance sera particulièrement marquée au treizième siècle. Dans cette thèse, j'étudie la façon de concevoir la *scientia* qui précède ces développements, en examinant des écrits rédigés avant et immédiatement après les premières traductions des œuvres scientifiques d'Aristote. J'établis que cette notion antérieure de *scientia*, plus ou moins élaborée selon les penseurs et étroitement liée à un contexte éducatif marqué par l'enseignement des arts libéraux et de la dialectique, est basée sur des concepts exprimés principalement par Augustin et Boèce. La *scientia* est comprise comme un savoir théorique et spirituel constituant une étape nécessaire dans la quête de l'état intellectuel ultime qu'est la sagesse (*sapientia*). Hugues de Saint-Victor articule la notion de *scientia* la plus accomplie, ses propos étant intégrés à une conception plus vaste de la connaissance comme purification de l'être. D'autres penseurs, qui ont déjà eu l'occasion de lire les œuvres scientifiques d'Aristote, expriment en revanche des conceptions informées par des nouveaux textes, mais qui, en general, restent proches de la tradition.

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In memoriam José Rafael Nájera Poveda (1927–2003)

Contents

Introduction

This dissertation is a study of the notion of science—in a general sense of the term—as understood and employed by thinkers in the Latin West in the twelfth century, right around the time when a great number of philosophical and scientific works by Greek and Arab thinkers started to be translated into Latin.

The project originated out of personal curiosity about the status of science and mathematics in the West, before the influx from those translations. The standard—and I think correct—view of this era, from the perspective of the history of modern science, is one of desolation and stagnation. With a few modest exceptions—Erigena, Bede, and perhaps some figures of the so-called Carolingian renaissance—nothing of importance was done on the scientific knowledge front. Indeed, the rediscovery of the long-forgotten texts of the Greeks, with Aristotle at the forefront, as well as the discovery of the previously unknown and unsuspected scientific prowess of the Arabs, is often presented as a sort of first awakening. The West was awakened from a long slumber, the last stage of which took the form of a concentration on rhetoric and dialectics in the

cathedral schools. After that, the Latin West engaged in a process of assimilation of the new science, but still only produced modest original results for the remainder of the Middle Ages.

Certainly, some figures of the twelfth century were very enthusiastic about the new texts. Thus, A.C. Crombie, in his fascinating book *The History of Science: From Augustine to Galileo*, was able to introduce this time period with a report from one of the early, passionate students of the newly acquired texts, the English scholar Adelard of Bath (c.1080–c.1152). In a dialogue in which Adelard gives an account of his findings, Adelard himself represents the "new" science and his young, fresh out of school nephew the "old" knowledge of the cathedral schools. The nephew is open to hearing all about the theories of the Arabs, but with much scepticism: he is sure that he will find some of the theories foolish, and, indeed, he vows to oppose his uncle whenever he has the chance.[1] The traditional education is depicted thus not only as stagnant, but also as stubbornly confrontational. Crombie, to be sure, is much more nuanced than that in his book, but, still, the general feeling about the period— as far as science goes—is mainly of sterility in the midst of a more or less rigid intellectual environment.

In the case of thought about science, the standard picture is even more desolate. Naturally, it will be very hard to find something like an original philosophy of science where we have already decided that there is basically no

[1] A.C. Crombie, *The History of Science: From Augustine to Galileo* (New York, NY: Dover, 1995), 29–30.

science to philosophize about. In even more dramatic terms, in this standard picture, and in relation to philosophy of science, there is the idea that, for the Latin West, this represented more than simply being awakened from its slumber by the influx of new writings. Rather, the implication is that the Latin West was just now coming to life. Indeed, the first genuine philosophy of science that we are bound to find in this view is none other than Aristotle's own philosophy of science, which is spelled out with precise technicality in the *Posterior Analytics*. The standard story after that is one of reception and understanding of this work. After a somewhat long period of study of the text—it was considered to be a very difficult one, as John of Salisbury famously pointed out in the 1160s—we start to see different waves of commentaries, beginning around 1230,[2] together with discussions about the scientific status of different disciplines, notably of theology and metaphysics.[3]

One reason, however, why the standard picture is so gloomy, may simply be that the years preceding the translation of Aristotle's works have not really been studied from the perspective of a history of philosophy of science. Certainly, we cannot be speaking here of a philosophy of science with

[2]Grosseteste came out with the earliest commentary. Then we have commentaries by Albert the Great, Thomas Aquinas, Duns Scotus, Giles of Rome, and William of Ockham. An analysis of some aspects of these works can be found in John Longeway, *Demonstration and Scientific Knowledge in William of Ockham* (Notre Dame, Indiana: University of Notre Dame Press, 2007), 1–140.

[3]Aristotelian philosophy of science, however, as is the case indeed with most Aristotelian philosophy, is generally seen from the perspective of modern science as leading nowhere. On a different strand of research, some historians of science see the beginnings of specific thought and activity on the empirical sciences in luminary figures like Grosseteste and Bacon, who are thought of as precursors of science proper. See, for instance, A.C. Crombie, *Robert Grosseteste and the origins of experimental science, 1100-1700* (Oxford: Clarendon Press, 1953).

a connotation of science in the modern sense—not even Aristotelian science is applicable here—but, rather, with the meaning of science to be taken in much more general terms. The most logical candidate for a concept which will encompass such an expanded inquiry is certainly *scientia*, a Latin word that not only translates 'science,' but also 'knowledge,' and that, furthermore, has been used to refer to important philosophical concepts throughout the history of Latin West philosophy. It is, for instance, looking beyond the Medieval period and into Early Modern times, one of the words used by Descartes to designate knowledge that is certain. Establishing the possibility of attaining *scientia*, and the conditions under which this can happen, are certainly important goals in Descartes's works.[4] More relevant to the Medieval period is *scientia*'s use as the translation of Aristotle's ἐπιστήμη.

Scientia, in Aristotle's philosophy, is a very specific technical term. In the *Posterior Analytics* I.2, Aristotle claims that we can say that we have scientific or unqualified knowledge (ἐπιστήμη) of a fact, as opposed to just incidental knowledge of it, only if: (a) we know that the cause (αἰτία) from which the fact results is the cause of that fact, and (b) we know that the fact cannot be otherwise.[5] According to Aristotle, this type of knowledge is obtained only through demonstration (ἀπόδειξις), which is a technical term he defines as "a

[4]Descartes uses also other expressions to refer to knowledge that is certain: *plane certus*, *perfecte scire*, *plane nota*, etc. See Descartes, *Meditationes Metaphysicae*, especially Meditation 5. For a recent interpretation sensitive to traditional conceptions of *scientia* see John Carriero, *Between Two Worlds: A Reading of Descartes's Meditations* (Princeton: Princeton UP, 2009), specially 3–4 and 348–352. For Descartes's project, see Stephen Menn, *Descartes and Augustine* (Cambridge: Cambridge UP, 1998), 18–70.

[5]Aristotle, *Posterior Analytics*, 71b10–13.

syllogism that enables us to know (scientifically) by the mere fact that we grasp it".[6] As with any other syllogism, a demonstration is composed of three categorical propositions, two premises and a conclusion, each of which links a subject to a predicate or attribute. The premises in demonstrations must be true, universal and primary; that is why Aristotle calls them principles (ἀρχαί).[7] They must be also causative of the conclusion—in the sense that it is by knowing the premises that we know the conclusion—and should deal with essential attributes of the things in question. A *scientia* for Aristotle is thus a collection of principles and syllogisms that deals with things of a specific kind—i.e., a genus—that is its proper subject matter. So, for instance, in the case of arithmetic, the subject matter concerns numbers, together with all the properties that belong essentially to them. We can thus say that the subject genus of arithmetic is number. For geometry it is extended magnitudes and their properties; for music it is relations between numbers, and the properties of these relations, and so on. A *scientia*, however, is not something that exists apart from souls. It is a disposition (ἕξις) of the soul to demonstrate,[8] that is, to provide valid logical inferences based on universal principles. As such, it is an accident of a soul and, so, when we talk about a *scientia* in general, say, the science of geometry, we are talking about a non-substance species whose individuals are the particular sciences of geometry inhering in particular rational souls.

[6] Aristotle, *Posterior Analytics*, 71b18.
[7] Ibid., 72a7–9.
[8] Aristotle, *Nicomachean Ethics*, VI.6, 1139b30.

We can expect a conception of *scientia* similar to this one in the works of medieval Latin thinkers working after the translation of Aristotle's *Posterior Analytics*. But, is there any conception of *scientia* prior to this? Unfortunately, even expanding the scope of the enquiry from science to *scientia*, we will not find much in the way of scholarship. Apart from shorter articles dealing with very specific aspects of science during the period, and usually focused on the seemingly eccentric Chartrian school,[9] the great majority of important and useful works dedicated to the twelfth century exhibit very different approaches, even if from them we can glean clues and elements that certainly apply to the investigation proposed here.

We have, for instance, a very interesting and comprehensive work about the educational environment in this century by the team of Paré, Brunet, and Tremblay.[10] They describe the educational settings and methods of the twelfth century in some detail, including an extended account of the development of theology, and also provide a classification of the different thinkers according, apparently, to their philosophical outlook. We thus have humanists and anti-humanists, utilitarians and religious reformers, scientists and dialecticians. These labels are obviously anachronistic for the most part, even if Paré

[9] A recent example of a book that deals with some of the issues is Peter Ellard, *The Sacred Cosmos: Theological, Philosophical, and Scientific Conversations in the Twelfth-Century School of Chartres* (Scranton and London: University of Scranton Press, 2007). Examples of articles are much more numerous. There is, for instance, a recent collection dedicated to some of the problems: Rainer Berndt, Matthias Lutz-Bachmann, and Ralph M.W. Stammberger, eds., *"Scientia" und "Disciplina": Wissenstheorie und Wissenschaftpraxis im 12. und 13. Jarhhundert* (Berlin: Akademie Verlag, 2002).

[10] G. Paré, A. Brunet, and P. Tremblay, *La renaissance du XIIe siècle: Les écoles et l'enseignement* (Ottawa: Inst. d'Études Médiévales, 1933).

et al. try to made them conform to issues and ideas specific to the time period. The scientist/dialectician distinction is based, for example, on the idea that some of the liberal arts are scientific—namely the mathematical ones—and others dialectical, something that probably was never put in those terms by any thinker at the time.[11] There are obviously other considerations at play here, and perhaps much more could be said about them if we go deeper into this idea of a "renaissance" of the twelfth century, and pay attention to the goal of Paré's team of fixing "the sense of this spiritual movement."[12] A very similar approach is used by Southern, but in this case with the idea of a special kind of humanism of the twelfth century, taking the place of renaissance as the guiding concept.[13] Again, these books are very interesting and useful, but their authors are not looking directly at the issue of the intellectual status of *scientia*.

Another important branch of scholarly literature concerning the period before the translation movement of the twelfth century, looks for clues regarding developments occurring in the thirteenth century. This is a century in which, generally speaking, we not only have Aristotle's texts integrated into the intellectual environment but also in which there is the consciousness of theology as a discipline in need of philosophical classification and definition. The prob-

[11]Paré et al. extrapolate on something resembling this distinction, which was originally made by William of Conches in *De philosophia mundi* IV. William's purpose there is to affirm that the non-mathematical disciplines of the liberal arts are just preparatory arts, whereas the other disciplines, in fact, really deal with things. See Paré, Brunet, and Tremblay, *La renaissance du XIIe siècle*, 195.

[12]Ibid., 138.

[13]R.W. Southern, *Scholastic Humanism and the Unification of Europe, Volume I: Foundations* (Oxford: Blackwell, 1995).

lem of theology as a science and of its relation to metaphysics—also called theology in Aristotle—as well as thinker's concerns about the status of metaphysics itself, are important in this context, and have been the subject of a number of scholarly works.[14] These are, of course, very interesting and important problems, but they are not really that prominent in most of the twelfth century.

From the secondary literature available it would certainly seem that issues concerning *scientia*, scientific disciplines, and their status, is an obscure or very minor topic in the twelfth century. The reality is, however, that there are long and important works dedicated to these very issues. Nobody can deny, indeed, that Hugh of St. Victor's *Didascalicon*, and Dominicus Gundissalinus's *De divisione philosophiae*, both written in the mid twelfth century, are non-trivial accounts of science and the sciences. Yet, there is still no comprehensive study of either of them in terms of their being part of philosophy of science in the general sense. Hugh's work has been sometimes dismissed as simply a manual for students—not very different from Cassiodorus's *Institutiones* from

[14]See, for instance, the recent collection of articles in Mathias Lutz-Bachmann, Alexander Fidora, and Andreas Niederberger, eds., *Metaphysics in the Twelfth Century: On the Relationship among Philosophy, Science and Theology* (Turnhout: Brepols, 2004). Older general works include M.-D. Chenu, *La Théologie au douzième siècle* (Paris: Vrin, 1957) and J. de Ghellink, *Le mouvement théologique du XIIe siècle* (Bruges: Éditions de Tempel, 1948). Older scholars seem to be more prone to using thirteenth century categories to look at the twelfth, usually with the background idea of Aquinas being the reference with which earlier medieval thinkers are to be measured. This is clearly the methodology used by Mariétan and Kleinz in their books dealing with some of the issues investigated in this dissertation. See Joseph Mariétan, *Problème de la classification des sciences: d'Aristote à St-Thomas* (Paris: Alcan, 1901) and John P. Kleinz, *The Theory of Knowledge of Hugh of Saint Victor* (Washington, DC: Catholic University, 1944). Since their approach is radically different from mine, I will not refer to their work in the rest of this dissertation, except in passing, but I should now note that they provided helpful initial pointers to relevant authors and texts.

several centuries earlier—or as being just a collation of passages from other sources.[15] It is a manual for students, certainly, and it contains many passages taken verbatim from the likes of Boethius and Isidore, but, as we will see in chapter 2 of this dissertation, it also contains important philosophical ideas about science and the sciences that are part of the author's comprehensive theory of knowledge. Gundissalinus's *De divisione*, on the other hand, having been written after some contact with Greek and Arab sources, has traditionally been studied as mostly a compilation of those sources.[16] No scholarly work with which I am familiar provides any answers to some fundamental questions. Why would these authors write works of this kind? Why would someone living in a particular time period which is seemingly devoid of scientific activity, be

[15]Taylor provides an overview of the different attitudes towards this text in the introduction to his translation: Hugh of St. Victor, *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*, trans. Jerome Taylor (New York: Columbia UP, 1961). Baron has a book on Hugh that overlaps to some extent with some themes in this dissertation: Roger Baron, *Science et sagesse chez Hughes de Saint-Victor* (Paris: P. Lethielleux, 1957). Baron, however, seems to study Hugh with the goal of defending, in general, a view of science as being somehow subservient to the Christian faith. His approach is thus also radically different from mine, and, so, even if I used Baron's book at the early stages of my research for general pointers, I do not engage with his views and do not respond to them in any way. Indeed, most of the general information and clues that I got from Baron I found out afterwards in more detail in his secondary sources (e.g., Chenu and Marrou), so there are not many direct references to his book in this dissertation. Together with Kleinz, who is cited above, and adding some articles here and there, Taylor and Baron represent essentially all that exists of dedicated scholarship on Hugh's philosophy. Modern theologians, on the contrary, are still interested in Hugh's theological views. See, for instance, Boyd Taylor Coolman, *The Theology of Hugh of St. Victor* (Cambridge: Cambridge UP, 2010).

[16]Gundissalinus has also been neglected in the literature ever since *De divisione* was edited by Baur in 1903. Baur gives a somewhat detailed account of the sources in the study; this appears after the text in his edition. See Gundissalinus, *De divisione philosophiae*, ed. Ludwig Baur (Münster: Aschendorff, 1903), 145ff. Recently, however, Alexander Fidora published a study on Gundissalinus's theory of science in which more attention has been given to Gundissalinus's debt to Latin sources; see Alexander Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus* (Berlin: Akademie Verlag, 2003). Fidora's approach seems to be to concentrate on very specific issues in Gundissalinus, as for example, his readings of particular passages in Boethius, the separation between Christian theology and Aristotelian divine science, and Gunsissalinus's indebtedness to figures such as Isidore. His project, although very interesting and useful, is thus very different from mine.

interested in writing a treatise about how the different disciplines are related to each other, and how they are arranged? Indeed, something in their intellectual environment must have been urging them in some way to engage in the project. More generally, and also more importantly, as mentioned earlier: Was there a particular notion of *scientia* current during this time period? Can we—perhaps in a future research project—compare and contrast this notion with the Aristotelian one that seems to have become the norm in later times, or can we attempt this exercise perhaps even with even later accounts of *scientia*? So, again, if there was a notion of *scientia* in this earlier time period, what was it, and what was its origin?

The goal of this dissertation is to try to provide an initial, plausible answer to these questions, which are key to our understanding of not only the twelfth century, but also of what came later when Aristotle's technical works about science were studied. In order to do that, I propose looking at the major authors involved, and reading their most explicit texts, without trying to anticipate problems that will only become important later on. I will undertake this project with the understanding also that the specific philosophical outlook of these figures can be gathered, not only from what they wrote with their own pens, but also from the textual materials they chose to include or not to include in their works. If we proceed in this manner, I believe we can potentially be more in tune with the actual intellectual environment of the day, and thus also gain some valuable insights into existing thought of the time.

The thesis I want to defend here is, indeed, that we can identify a com-

mon, non-trivial notion of *scientia* in this period that is the result mainly of a strong educational tradition based on the liberal arts—a tradition that was by this time so deeply integrated into intellectual circles that even some debates about the importance and extent of learning were carried out using its tools. More philosophically important, that conception of *scientia* is found to be compatible with the ideas and texts of Augustine and Boethius. *Scientia* in this context designates, I believe, knowledge that is meant to lead the knower towards wisdom (*sapientia*), that is, towards an intellectual state of contemplation of God. Both Hugh and Gundissalinus seem to be working generally within that intellectual setting, and both seem to have been preoccupied with presenting a coherent picture of the sciences using the materials available to them. Hugh, who most certainly did not have access to Aristotle's non-logical works, presents us with a more detailed philosophy of knowledge—in comparison with his peers—on which to base *scientia* and with which to explain the different disciplines and sciences that make up the whole of philosophy. Hugh represents indeed, I argue, the clearest evidence that thinkers of the period had more than just passing and derivative interest in the issue of science—science, again, understood in a general way. Gundissalinus, on the other hand, strictly speaking belongs to what we could call the Aristotelian period, since he had access to Arabic and Greek sources. From examining the way in which he dealt with those materials, however, it is clear that Gundissalinus does not represent an abrupt break with this idea of *scientia* as related to *sapientia*. He uses new sources that certainly provide new and more sophisticated views—the product

of a long tradition in the Arab world—but his presentation still follows the idea of the primacy of wisdom. It is also clear that Gundissalinus certainly tries, sometimes with odd results, to reconcile that traditional view with the new sources he has available.

The dissertation is organized into four main chapters. In the first chapter, I study the intellectual and educational background of thinkers of the period. This chapter thus has sections on the liberal arts tradition, and presentations of issues surrounding science in three major Early Medieval authors: Augustine, Boethius, and Isidore. Augustine and Boethius provide most of the philosophical substance to the notion of *scientia*, although it is clearer and more complete in Augustine. Thus, I mostly use Augustine's views as the basis for comparison and contrast with later accounts. In the second and third chapters I then read the texts of Hugh and Gundissalinus with Augustine in mind.

In the second chapter, thus, I deal with Hugh of St. Victor. As an introduction to his work a provide a brief account based on current secondary literature on important intellectual developments in the eleventh and early twelfth centuries, specifically the changes in the educational structures, the rise of dialectics and controversies regarding the place of pagan disciplines in the life of the Christian. Hugh is the major author of the time with respect to *scientia*. I provide an account of how his philosophy of science integrates with his philosophy of knowledge, contrasting it with that of Augustine. Hugh's views represent the most sophisticated account of *scientia* in the twelfth century; for the authors who follow him during this period, on the other hand, we

have to content ourselves mostly with general views.

In the third chapter and fourth chapters, I explore authors who did have access to Aristotle's scientific works. The main author, and the subject of the chapter 3, is Gundissalinus, whose extensive use of both Arabic and Latin materials demands, for the most part making sense of the thinker's editorial decisions. After attempting to give an account of Gundissalinus's work with regard to *scientia*, I turn in the fourth chapter to another interesting twelfth century author, John of Salisbury, who writes several decades after Gundissalinus and Hugh, but who still only shows hints of being in the process of adopting Aristotelian philosophy of science.

Finally, in the concluding chapter, I summarize the results of this enquiry, and provide brief remarks about possible ramifications, and potential room for further investigation.

Chapter 1

Early Medieval Legacy

In this chapter I intend to characterize the intellectual environment—with respect to the sciences and to thought about science in a general sense—in which thinkers in the twelfth century developed their ideas. The first main source of clues concerning the meaning and conception of science during this time, is the evolution and intellectual history of the educational curriculum. Indeed, Latin philosophers in the mid twelfth century mainly followed the same basic program, namely the study of the seven liberal arts plus reading and interpretation of sacred texts. The liberal arts program of study had its origins in Classical Greece, survived during the Hellenistic period, was subsequently adopted by the Romans and then, with appropriate sanctions—especially from Augustine—made it into the Latin Christian world. Important for our purposes are the philosophical justifications given for the constitution and appropriateness of this curriculum throughout the ages. Furthermore, we must note that perhaps the most important source to draw from is the work of Augustine, whose

writings contained the most sophisticated and influential account of science and knowledge available to Latin Christians for close to six centuries. He is responsible for the view that science, which includes the liberal arts, is and must be valued as a means to the primary quest for intellectual contemplation of God, what he calls wisdom.

I will proceed chronologically, starting with a brief overview of classical education and its content, along with its traditional philosophical justification, ending the section with the description of a fourth century work by the pagan writer Martianus Capella. This work became influential during the Middle Ages, and exemplifies the state in which some of the disciplines were at the time. It is, in fact, a standard presentation of the curriculum, whose contents allow us to gain a feeling for the actual development of the disciplines, as they were transmitted to the Latin world. In the following section I turn to Augustine and analyze his thoughts not only on the curriculum but on knowledge in general. The important Augustinian distinction here is between *scientia* and *sapientia*. I explore in this section Augustine's Neoplatonic influences and review his thoughts on the possibility of attaining that ultimate stage of knowledge which he prescribes for man. The third section in the chapter is devoted to Boethius, who was another influential figure in later times. Also influenced by Neoplatonism but with access to more Greek texts than Augustine, Boethius seems to indirectly use some important Aristotelian notions, especially the notion of ἐπιστήμη and the tripartite division of the theoretical sciences. In this third section I describe these notions and try to determine the sort of reading

of Aristotle to which Boethius is committed. Continuing with the chronology, I finish the chapter with an overview of the eclectic mix of views collected and presented by Isidore of Seville in his seventh century *Etymologies*, a work that was consulted widely and that served as a source of quotations for a number of thinkers throughout the Middle Ages.

1.1 The Classical Curriculum

Leaving aside the study of Christian Scriptures, standard higher education in the Latin world up to the thirteenth century—when it was replaced by Aristotelian science and philosophy—was fundamentally the continuation and evolution of an educational tradition that originated Classical Greece and Rome. At the core of this program were the seven liberal arts. In the first century BCE, Varro (116—27 BCE) puts forth the definition of the liberal arts that was to be followed throughout the Middle Ages. In his *Disciplinarum Libri IX*, a work that is now lost, Varro talks of nine basic disciplines arranged in three groups. Group I consists of grammar, rhetoric and dialectic, what would be called 'trivium' by a scholar in the court of Charlemagne in the ninth century.[17] Group II, which Boethius was to call the 'quadrivium' or 'the fourfold way' in the sixth century, groups the mathematical disciplines: geometry, arithmetic, astronomy and music. Group III, which was to quickly disappear as part of the

[17]Varro's scheme is explained, including this note about the origin of the term 'trivium,' in Olaf Pedersen, *The First Universities: Studium Generale and the Origins of University Education in Europe* (Cambridge: Cambridge UP, 1997), 23. Pedersen provides a concise and clear account of the origins of the liberal arts in chapter 1 plus a useful survey of the development of education in the Middle Ages in the rest of his book.

liberal arts, consisted of medicine and architecture. Neither discipline ever regained its place as part of the basic curriculum, although both, and especially medicine, were obviously very important disciplines with a long tradition of practice, texts, and intense development.

The disciplines of the trivium were apparently considered an essential part of a well-rounded education by most members of Greek and Roman elite, who generally would give more importance to public speaking skills than to, say, knowledge of arithmetic theory, when social standing was on the line. There are writings on each of these three disciplines going back to the fifth century BCE in Greece, and in Rome also—especially after the first century.[18] The Stoics, who were influential especially in Rome, may have provided some of the philosophical justification for the inclusion of dialectics and rhetoric. They divided philosophy into ethics, natural philosophy and logic, the latter including both dialects and rhetoric. Isidore will capture this division of philosophy in his *Etymologies* in the seventh century, although without mentioning the Stoics.[19] By Varro's time, in any case, it was taken for granted that these two disciplines plus grammar were the primary ones worth pursuing in most programs of study.[20] Other disciplines—physics, for instance—were pursued in particular schools, or by particular masters. It seems that the mathematical disciplines, on the other hand, were less commonly taught, both in Greece

[18]For more detailed accounts of particular practices and texts, refer again to Pedersen, *The First Universities*, ch 1, but also to Ilsetraut Hadot, *Arts libéraux et philosophia dans la pensée antique* (Paris: Études Augustiniennes, 1984), chapters 1 and 2.

[19]See page 73 below.

[20]See William H. Stahl, *The Quadrivium of Martianus Capella*, in, vol. I of *Martianus Capella and the Seven Liberal Arts* (New York, NY: Columbia UP, 1971), 98.

and also in Rome. Apart from the most basic notions, an educated citizen was probably not expected to know much about them, although they might have been important for philosophers, some of whom had in fact argued for their higher status.[21]

Indeed, the idea that the mathematical disciplines are not only fundamental but also closely related to one another can be traced back to the so-called Pythagoreans, five or six centuries BCE. Archytas, for example, stated that mathematicians provide mainly clear knowledge of the speed and motion of the stars, as they do of geometry, of arithmetic, and even of music, since these have been indeed proven to be "sister-studies."[22] The relation between these disciplines presumably works in two dimensions. In relation to their subject matter, arithmetic and music—the mathematical study of ratios and harmonics—deal with discrete numbers whereas geometry and astronomy—the mathematical study of spherics and the harmonious motion of celestial bodies—deal with continuous dimensions. In relation to their level of abstraction, arithmetic and geometry are fully abstract, whereas music and astronomy more specifically relate to things in nature or, at least, to things considered with an element of motion. The exact relationship is hard to pinpoint across the authors. Suffice it to say that there was general agreement that these disciplines were closely related, and formed part of a distinctive and cohesive group.

[21] See Stahl, *The Quadrivium of Martianus Capella*, 90–91.

[22] Archytas, who lived between c.400 to 350 BCE is generally considered one of the most prominent Pythagoreans. Porphyry quoted him in the 3rd century CE. See H. Diels, *Die Fragmente der Vorsokratiker* (Berlin: Weidmannsche Buchhandlung, 1902), vol. 1, p. 429. The reference comes from Pedersen, *The First Universities*, 8.

Other philosophers would also adopt the Pythagorean idea that the more abstract disciplines were more fundamental, and thus more important than the rest. This idea would also be adopted by Augustine and Boethius, as we will see. Plato, to cite the most influential figure, argues in the *Republic* for an education that includes music (and poetry) in the first place, and then, for the would-be philosopher-kings, training in the mathematical disciplines in the abstract. As a first step, Plato argues, music, through rhythms and harmonies, cultivates some good habits for the soul just as gymnastics does it for the body (522a). Music here is not theoretical instruction of the kind Archytas was referring to but only the practical skill of playing an instrument or singing. Philosopher-kings, however, need much more than that, according to Plato. They must go to the root of knowledge, which Plato says resides in number and in calculation, because both of these are common to every science and craft. These two subjects, contrary to the simply pragmatic way in which some people use them, are in fact fit in every way to draw one towards being and the divine, as they do not depend on sense perception, but rather on the intellect. The best minds, therefore, must study numbers in the abstract. They should also study geometry, but should refrain from thinking about it in terms of doing practical things such as 'squaring' or 'adding' (522c–527a). Finally, Plato completes the quadrivium for the philosopher-kings by adding astronomy and theoretical music. These subjects deal with the mathematical aspects of astronomy and music, rather than with the practice of observing the sky or playing an instrument, and are considered to be closely related as mathematical

disciplines, as we just saw. Plato, in fact, explicitly says that, in this view, he agrees with the Pythagoreans (530d). The goal for Plato, however, is arriving at truth, and so for him the ultimate discipline is advanced dialectics: the art of discussion leading to truth. This is not the kind of dialectics taught to younger students; only the selected few will embark on its practice, and thus will become true philosophers.

Plato's views were influential later on, as we will see, but it is not clear to what extent they were implemented in his own society. Other figures of the time, such as Isocrates, were more in tune with the social expectations of their fellow Athenians, and expressed a preference for a generally informed culture as the ideal for the citizen.[23] In a way, Aristotle extended that view to the maximum, having himself pursued a great variety of disciplines, and having made a distinction between the wise (σοφός)—one who knows perfectly one particular art or science, and the universally wise (ὅλως σοφός)—who knows the causes and principles of many sciences.[24] In any case, as with Plato, we do not know up to what extent Aristotle's views on the pursuit of the sciences were actually implemented in mainstream, basic education either in Greece, or afterwards in the Hellenistic and Roman worlds. We only know that something like the Athenian education lived on, and eventually the liberal arts rose up to prominence in the works of thinkers, to the detriment of other disciplines

[23]For an overview of Isocrates' views, see Hadot, *Arts libéraux et philosophia dans la pensée antique*, 16–18.

[24]These views on wisdom can be found in *Nichomachean Ethics*, see for example 1141a9–17. In *Metaphysics*, 982a1–5, Aristotle states that wisdom in general is actually knowledge of certain principles and causes.

which the elites may have studied and practiced at the time.

Varro's views, in any case, were seemingly the only reference in Latin with regard to the liberal arts for the first four centuries CE. It is only in the fifth century that we find newer attempts at defining and explaining these foundational disciplines in the works by Martianus Capella, who still worked under a pagan frame of mind, and then in the sixth century with the Christians Boethius, Cassiodorus, and Isidore of Seville. In the works of all these thinkers, the basic structure and definition of the curriculum remains intact with its seven disciplines.

Martianus's work is an interesting case to look at because it gives us and idea of the last wholly pagan, overall picture of the liberal arts. It also gives us an idea of the level at which these disciplines were transmitted to the Latin West. Martianus was not the only reference available, of course, but his writings pointed also to other works and authors.

Martianus's work, *De nuptiis Philologiae et Mercurii* or *On the Wedding of Philology and Mercury*, was probably written not earlier than 410 and not later than 439.[25] The work is an allegorical exposition of the curriculum that, if anything, shows that, during all those centuries, in his cultural environment, there was no major development in the basic disciplines. In fact, in regard to some of these disciplines, major sources appear to have been lost or unavailable for Latin speakers. This is the case most notably in regard to geometry, for which Martianus contents himself with giving merely an overview of ge-

[25]Stahl, *The Quadrivium of Martianus Capella*, 15.

ography instead, only mentioning the basic definitions of point, line, surface and geometrical figures. *De nuptiis*, in any case, is only an exposition of the bare basics of both the trivium and the quadrivium, presented as a sequence of guests talking at a wedding banquet laid on by the gods. Although Martianus's symbols and themes are entirely pagan, the work was to be widely read for many centuries and later Christian thinkers would try to interpret his allegories in a way compatible with Christian culture. The second chapter, for instance, starts with Philology learning about the gods' decision to allow Mercury to marry her, and then trying to decide on her own whether the marriage is convenient. She indeed wants to marry Mercury, whom she has only glimpsed fleetingly when she was picking some herbs. The common interpretation for this passage is that Philology represents human intellect and knowledge. According to Remigius of Auxerre (c.841–908) , who commented on Martianus's work, this may also mean that Philology only aspired to a higher level of knowledge and eloquence, which is represented here by Mercury. The herbs she was picking would represent the rudimentary studies in which she was engaging. Only after being helped by the seven liberal arts, whom Mercury sends to her as maidens, will she attain that higher level.[26] This idea of the liberal arts as a path to higher knowledge and wisdom will be repeated again and again whenever Christian thinkers deal with education.

The actual content varies for each discipline but, in general, the exposi-

[26]Martianus Capella, *The Marriage of Philology and Mercury*, in, vol. II of *Martianus Capella and the Seven Liberal Arts*, trans. William H. Stahl and Richard Johnson with E.L. Burge (New York: Columbia UP, 1977), § 100 (34) fn. 5. References are to section number with page number in brackets.

tions are brief. Starting with Martianus we no longer find Varro's third group of liberal arts disciplines included as part of the whole. As I stated earlier, architecture and, much more extensively, medicine, were of course practiced and studied, but not as part of the basic curriculum of higher education. Martianus does not even mention them, and it is likely that they had been taken out of the picture a long time before he wrote *De nuptiis*. They will not appear again as part of general education and will follow an independent development.[27] The trivium is fairly well presented with sufficient material, so that the work can indeed serve as an elementary manual for students. In the case of grammar, for example, there is a short but complete and accurate presentation of the concepts of letter, syllable, word, and etymology, all with a fair number of examples. The section on dialectic, for its part, covers the basics of Aristotelian logic except the theory of demonstration. This section ranges from definitions of categories and terms, to examples of the different forms of syllogism. It is unlikely, however, that Martianus had read Aristotle; he probably just copied or edited an already existing summary. As for rhetoric, Martianus also provides a fairly complete picture, this time following Ciceronian concepts with improvements by other figures. Martianus' own contributions, however, are of negligible significance.

Martianus' elaboration of the quadrivium, on the other hand, is sketchy at best. He begins with geometry. With Euclid and Archimedes—both at the

[27]See Pedersen, *The First Universities*, 23–24. Probably under the influence of Avicenna, Gundissalinus will include medicine in between the disciplines of the trivium and the quadrivium, as we will see in chapter 3, page 138 below.

banquet—looking on, the character Geometry explains that her name means that she has traversed and measured all of the earth; she then claims that she can describe it from memory. Indeed, the next hundred or so sections comprise a geographical account of presumably all the earth known at the time.[28] The gods are not happy with this dry account, and order Geometry to be more concise and brief. This is perhaps only Martianus's rhetorical justification for not offering a more complete account of the matter, probably because not much about geometry was commonly known. The rest of the presentation is a mere listing of basic geometrical concepts (point, line, surface, etc.), and allusions to some of Euclid's results. In the end, the gods are given a copy of Euclid for future reference, thus signalling to the reader that, for real study, this is the book to consult. The problem, however, is that it seems that no complete works of Euclid were available to a Latin audience by Martianus's time, and in fact, they were not available for many centuries to come. The level of theoretical geometrical knowledge was therefore very low, and Martianus did not really have much material to summarize. Some treatises about geometry, including perhaps Varro's, included some elements of surveying, although surely not to the point where geometry would include geography as well. Perhaps Martianus decided to include geography here so that this part of the treatise would be as extensive as the others.[29]

Arithmetic, in contrast, receives a much fuller presentation. A great part

[28]Martianus, *Marriage*, §§ 589–704 (220–263).

[29]This is Stahl's view. See Stahl, *The Quadrivium of Martianus Capella*, 127–131. Martianus may have used Pliny's *Natural History* as his main source in this part.

of her perfomance is actually a thorough and clearly Pythagorean explanation of the meanings of individual numbers from one to ten. Number one, the monad, is, as a matter of fact in a class of its own: it is the beginning and the generator not only of other numbers, but of all the mundane realms. It is self-sufficient, eternal and at the same time part and whole. The remaining numbers in this range are related to different attributes, virtues, and gods.[30] The details need not really concern us here, but it should be noted that the fact that Martianus uses so much space in his treatise on this matter is a clear sign of the importance of numerology during this time. It was probably considered an acceptable, and reputable discipline, at least in the sense that it seemed to point to some sort of important knowledge. Even Christian authors, including Augustine, do treat it seriously.

The rest of the exposition is on the classification and properties of numbers: odd and even numbers, prime numbers, divisibility, relations, etc. Martianus seems to have more reliable and extensive sources to summarize. It seems that, ultimately, his summary is based on Nicomachus of Gerasa's *Introduction to Arithmetic* and marginally on Euclid's *Elements* books VI, VIII and IX, although he may not have consulted those works directly.[31] Nicomachus, who lived around 100 CE and was clearly a Neo-Pythagorean, was a deeply influential figure, not only to Martianus, but also to Boethius, as we will see shortly. His *Introduction* is much more detailed than Martianus's account, but just as

[30]Martianus, *Marriage*, §§ 730–731 (276) on the monad and §§ 732–742 (276–85) on the rest of the numbers.

[31]Stahl, *The Quadrivium of Martianus Capella*, 151.

in *De nuptiis*, he does not provide any demonstrations. It is indeed a vulgarization work, albeit a thorough one, rather than a treatise for specialists. In essence, Martianus repeats most of what is in Nicomachus, without attempting to effect any substantial change on the subject matter. Also in line with Nicomachus, Martianus has a section on numerology as well. Although in his *Introduction* Nicomachus does not talk about numerology, he has a treatise on that subject with the title *Theologumena arithmeticae*.[32] What is not in Nicomachus—for example, some propositions about the additions and products of odd and even numbers—Martianus gets from Euclid.[33]

The sections on astronomy and music (harmony) are not as detailed as the one on arithmetic. For Astronomy Martianus provides a basic description of the celestial sphere: the idea that celestial objects move around in circles in a sphere, with the earth at the centre. He also presents an annotated list of the different objects, their motions and positions. Music, on the other hand, is first introduced by a series of songs, an account of musical instruments, and then a relatively short section describing the basic harmonic ratios and intervals, with some mention also of rhythm.

In Martianus we thus see a fairly detailed account of the trivium and a sketchy look at the quadrivium. For the trivium, the Latins also had other more advanced works. In regard to grammar, for example, there was Priscian's

[32]F.E. Robbins and L.C. Karpinski, "Studies in Greek Mathematics," in *Introduction to Arithmetic*, by Nicomachus of Gerasa, trans. M.L. D'Ooge (London: Macmillan, 1926), 90–91.

[33]A more detailed account of the differences between Martianus and Nicomachus, and more specifics about what Martianus takes from Euclid can be found in ibid., 139–141.

Institutiones Grammaticae, which was copied, summarized and quoted in many different forms throughout the Middle Ages. In addition, there was also Donatus's *Ars Grammatica*, a work which was widely used. For rhetoric, Cicero was also available, and as for logic access was available, eventually, to translations and commentaries of some of Aristotle's books. Yet, there was nothing much beyond what Martianus referred to, even six hundred years later in the twelfth century, especially for the quadrivium. Martianus also gave the Latin West a source of imagery that at different points in history, as we saw in the case of Remigius, served some thinkers in illustrating the importance, and even some particular aspects of the different disciplines. The liberal arts, in any case, were by this time and would be for many centuries the emblematic disciplines of human knowledge. What was missing after Martianus was a truly Christian sanction of them. This was to become part of Augustine's work.

1.2 Augustine

Augustine's work undoubtedly represents the most important intellectual support for the continuity of the classical program. We can say with certainty that this support arises from his view that the liberal arts—plus other minor disciplines—are a necessary course of study before the pursuit of higher levels of learning. The goal, according to Augustine, is to know and contemplate God, most probably but not necessarily with the help and guidance of faith. To this knowledge and contemplation of God, he assigns a distinct word: *sapientia*.

In a few places throughout his writings, Augustine lists the different disciplines of the liberal arts, and although there are some variations in his lists, he follows the standard Varronian scheme.[34] Augustine's main direct influence was, in fact, most probably Varro himself, and indeed part of what we know about Varro comes from Augustine.[35] Augustine even claims to have planned to write a series of handbooks on the liberal arts, just after his baptism, while he was in Milan, circa 387. In *Retractationes*, a work written near the end of his life, he expresses regret on the fact that he could only complete the handbook on grammar, which he had lost by then, and six volumes of the handbook on music.[36] In the latter, titled simply *De musica*, he follows the standard views already articulated in the works of Martianus, even including Pythagorean ideas about the mystical meanings of particular numbers. He explains, for example, how the different numbers are more or less harmonious, with the number 10 being special, since it is the sum of the first four natural numbers.[37] Book VI is particularly interesting as in it Augustine presents a scale of numbers that goes from what he calls 'corporeal' numbers up to 'rational' numbers that belong in the soul.[38]

[34]Marrou provides a table with the different lists in Henri-Irénée Marrou, *Saint Augustin et la fin de la culture antique* (Paris: Éditions E. de Boccard, 1958), 189. In a couple of these lists, curiously, Augustine omits arithmetic, but, according to Stahl, this might as well have been for mystical reasons, just so that the total number of disciplines was precisely seven. See Stahl, *The Quadrivium of Martianus Capella*, 93.

[35]We know some specific details about Varro also through encyclopedists such as Pliny and Gellius. See ibid., 43.

[36]Augustine, *Retractationes*, I.6 (17:40–54).

[37]See Augustine, *De musica*, ed. G. Marzi (Firenze: Sansoni, 1969), I.12 (144–162). In a similar way, for Augustine geometrical figures have different levels of perfection, the circle being the most perfect, see *De quantitate animae* 10 (16), c. 1044-1045, cited in Marrou, *Saint Augustin et la fin de la culture antique*, 264.

[38]Augustine, *De musica*, VI. There are many problems of interpretation in this book,

Augustine did not start to write these manuals merely as a pastime. He had by then already converted to the Christian religion, and he had a justification for the traditional educational program. The significance of the liberal arts for Augustine resides not in their practicality, but in their role as cultivators of the mind. The liberal arts are primarily concerned with theoretical knowledge. Whatever practical aspects they may have, seem to represent, for Augustine, simply a snare to draw the student's interest into incorporeal, eternal things: "[…] desiring corporeal things to move towards and arrive at incorporeal things," he says in *Retractationes*.[39] Certainly, as it is clear in *De musica*, the liberal arts for Augustine are strictly within the domain of knowledge (*scientia*), which in this early writing is already characterized as something ascribed to soul and found only in the intellect, not in memory or sense-perception.[40]

It is not surprising, therefore, that in other works Augustine gives mathematics, presumably a purely rational activity, a special role. The goal, however, is not to engage in mathematical theorizing just to know some facts about numbers or geometrical figures. The idea is to get to know number itself, which for Augustine is identical to wisdom (*sapientia*). Augustine talks about this, for example, in book II of *De libero arbitrio*. He affirms to Evodius, his interlocutor in the dialogue, that it is not groundlessly that in a passage from the Sacred Scriptures wisdom and number are, in fact, equated.[41] Evodius has doubts

starting the very meaning of Augustine's 'number'. For an overview see Marzi's introduction to the text in the edition just cited, specially pages 53–68.

[39] "[…] per corporalia cupiens ad incorporalia [...] vel pervenire vel ducere," Augustine, *Retractationes*, I.6 (17:43–4).

[40] Augustine, *De musica*, I.4.8 (108).

[41] "Non enim frustra in sanctis Libris sapientiae coniunctus est numerus, ubi dictum est:

about Augustine's position; certainly, many people know how to count and do things with numbers, yet not many of them are wise. Augustine replies that this is indeed an astonishing fact, but the truth is that number and wisdom are the same, for they both belong to that region which is the most distant from the corporeal.[42] Numbers are everywhere and seem to be "impressed" in bodies, but they actually transcend our soul, and remain unchanged in truth itself.[43] In an earlier paragraph, Augustine had given the key to understanding the special nature of number, when arguing that numbers, in fact, are not impressions in our soul that we get through sense perception. Numbers and their relations, he says, are things that all rational beings can grasp, each rational being with his or her own intelligence and thought.[44] Some peculiarities of numbers cannot be explained if they are considered to be impressions from our senses. We cannot make sense, for example, of saying that can we perceive the operations we do with numbers, such as addition and substraction. Furthermore, it is clear that all numbers and their relations are eternal—$7 + 3$ is and always will be 10—independently of what our senses tell us. Furthermore, the sequence of numbers is infinite, but we cannot perceive an infinite sequence with our senses.[45] The truth is that we have residing already in our souls a

Circuivi ego et cor meum, ut scirem, et considerarem, et quaererem sapientiam et numerum." Augustine, *De libero arbitrio*, ed. W. M. Green, Corpus Christianorum Series Latina 29 (Turnhout: Brepols, 1970), II.8.24. The quotation is from Ecclesiastes 7.25, for which the usual translation, starting with the Vulgate, of the last two words is actually wisdom and reason, not number.

[42]Ibid., II.11.30.

[43]"invenimus eos etiam nostras mentes transcendere, atque incommutabiles in ipsa manere veritate" ibid., II.11.31.

[44]Ibid., II.8.20.

[45]Ibid., II.8.21–22.

notion of number, in fact, a notion of the unity, from which all numbers derive. All objects grasped by the senses, Augustine argues, imply or consist of a plurality. Even the smallest body has at least a top and a bottom part, a right and a left part, and so on. We would not be able to discern and count those parts without a prior cognition (*cognitio*) of unity.[46] This cognition of unity is thus prior to anything relating to bodies and the impressions in our senses, and thus should come from our intelligence itself. This shows, according to Augustine, that numbers and their relations come to the mind from a truth independent of anything else. It is precisely the particular nature of numbers and their relations—including, presumably, not only those relations that we study in arithmetic, but also those of all other mathematical disciplines—that make the study of mathematics a suitable path through which to take the soul from the consideration of particular things to immutable, independent truths—that is, to *sapientia*. It is only as long as it is a part of a path to *sapientia* that any discipline seems to have any intrinsic worth for Augustine, and so the liberal arts, and the mathematical disciplines especially, are very important.

The one and only goal should be *sapientia*. But, what exactly is *sapientia*, and is it really possible to attain it? This is a common theme in Augustine but one the most explicit accounts is found in his mature work *De trinitate*.[47] One

[46]Augustine, *De libero arbitrio*, II.8.21.See Menn, *Descartes and Augustine*, 159–160 for a thorough explanation of Augustine's argument and of its wider context. Here I just want to point out the general importance of mathematics for Augustine's notion of *sapientia*.

[47]See Mary T. Clark, "De Trinitate," in *The Cambridge Companion to Augustine*, ed. Eleonore Stump and Norman Kretzmann (Cambridge: Cambridge UP, 2001), 91–102 for a general overview of this work.

of Augustine's main tenets here is that there is something similar to God in our soul. This is one of the major ideas that Augustine drew from his reading of "the works of the Platonists", specifically the writings of Plotinus. God is an incorporeal being responsible for reason. He is, so to speak, Reason with a capital R, reason in the abstract, with perfect knowledge and infinite power. Our souls are endowed with the capacity to reason, and thus we depend on God. We are not parts of that Reason. We are reasoning beings for whom the standard of truth and rationality is God himself. We also have a material body, and in the interaction between our body and soul we have the capacity of deciding what to do. Instead of turning ourselves to God and the rational, we may turn to the body and carnal pleasures, and thus away from God. The key to get to know God is, therefore, to look into ourselves and see Him there.[48]

The notion of *sapientia* is explained more fully beginning in book XII, after Augustine has established the scriptural basis of his trinitarian doctrine, and has also dealt with a number of problems derived from it. Up to this point in *De trinitate*, Augustine has used *sapientia* as a synonym for the wisdom of God, saying, among other things that it is an essence, not an accident. Wisdom is, in fact, the actual essence of the divinity, he had said in book VII. If a soul partakes in wisdom and then moves away from it, wisdom still remains in itself.[49] Wisdom is thus always available for man to attain it. What man needs

[48]For a thorough explanation of this, see Menn, *Descartes and Augustine*, especially 144–166.

[49]"Et quoniam quaecumque anima participatione sapientiae fit sapiens, si rursus desipiat, manet tamen in se sapientia…" *De Trinitate*, VII.2 (248). References to *De trinitate* will be to book number, section and page number in the standard Latin edition of the work: Augustine, *De trinitate*, ed. W. J. Mountain and Fr. Glorie, Corpus Christianorum Series

to do is basically to partake in wisdom, that is, to partake in God, which is, of course, doable according to Augustine.

Man, Augustine explains at the beginning of Book XII following Paul's expression, has an "inner" man that sets him apart from the beasts.[50] The "outer" man includes not only body, but also all the things that give vigour to body, among them perception, which is a quality humans share with animals. The inner man, on the other hand, includes two kinds of reason, one geared towards the material, and the other geared towards the purely rational. What makes reason as a whole a distinguishing factor in man, is the fact that we can not only have recollections in the mind, but we can also put those recollections together at different times, without needing an external cause to arouse them. In other words, we can gather recollections, even seemingly disparate ones, and "sew" them together to arrive at true, and not merely probable, thoughts. Presumably we are able to do this because, as Augustine explains next, there is a sort of connection between us and a higher realm of incorporeal and eternal reasons. We judge and measure corporeal things according to those higher reasons that are, strictly speaking, above us, but that somehow are attainable in practice.[51] Indeed, as we saw earlier, being aware of the nature of number, and specifically of unity, is one way in which we have a connection with a higher, purely non-corporeal, realm. The two distinct parts in the mind are

Latina, 50–50a (Turnhout: Brepols, 1968).

[50]See 2 Corinthians 4:16.

[51]Interestingly, according to Augustine, if we had true access to those higher reasons we would not see them as immutable. In any case, we do see them that way, and the fact that we use them indicates the existence of a connection to them. See Augustine, *De trinitate*, XII.2 (357).

both rational, Augustine continues; they are distinct yet inseparable just as there is the masculine and the feminine, and still only one type of flesh, human flesh. One is directed to corporeal, temporal things, to action, decision and execution; the other is connected to the incorporeal and eternal, and is geared towards reasons and everything rational. It is in the latter, and only in the latter, Augustine says, that we can find something like the image of God, even though the two parts are one in reality, and their difference lies only in their function.

Before explaining how these two parts may work together to achieve *sapientia*, Augustine gives an extended and severe warning about the perils of letting the action-oriented part of the mind seek too much after corporeal things. Doing that is, in fact, Augustine claims, not much different from that first sin in the Garden of Eden, when Eve let the snake talk her into eating from the forbidden tree, and then convinced Adam to do the same. Eve represents the part of the mind that goes after corporeal things, and thus it is not surprising that she was easy to convince. A bigger sin, however, was committed when Adam, representing the part of the mind that prefers the rational, also succumbed to temptation. The meaning here is clear for Augustine: man found an allegedly rational pretext for going after purely temporal things. This same tendency can come over man at any time and the results are often perverse. Just as in the Garden of Eden, Augustine says, sinful men realize they are naked, and try to cover up their shame, now with a fabric made out of words—empty

words without the fruit of work.[52] This section of the treatise ends with Augustine's condemnation of this part of reason, which is also the part of reason to which knowledge (*scientia*) belongs, a part of reason that grounds itself on the experience of the non-eternal. Man disgraces himself indeed "when he neglects the love of wisdom (*sapientia*) which always stays the same, and lusts after knowledge (*scientia*) derived from experience with changeable things; [this knowledge] inflates but does not edify."[53] *Sapientia* certainly cannot be attained with this part of reason, which Augustine characterizes more explicitly a few lines later as "the cognition of temporal and changeable things that is necessary for managing the affairs of this life."[54] *Scientia* thus, has its dwelling in a part of human reason that is both necessary to man but also prone to get him or her in trouble, a part of reason that tends to pull man away from God. The problem with this part of reason resides, Augustine explains in the rest of this section, in that it does not direct man according to the highest good. It cannot do it because it is that part of mind that is not in contact with eternal conceptions. It can only direct man according to the enjoyment of material things, and that can only provide false happiness. The sin is, specifically, that this type of enjoyment is private, and thus is a personal good, as opposed to

[52] Augustine, *De trinitate*, XII.8 (368).

[53] "Cum enim neglecta caritate sapientiae quae semper eodem modo manet concupiscitur *scientia* ex mutabilium temporaliumque experimento, *inflat* non *aedificat*." ibid., XII.11 (370). The English translation (with small changes) is taken from Augustine, *On the Trinity : Books 8–15*, ed. Gareth B. Matthews, trans. Stephen McKenna (Cambridge: Cambridge UP, 2002). Augustine uses again here an expression for the apostle Paul to give rhetorical weight to his position. The phrase "[knowledge] inflates but does not edify" comes from 1 Cor 8:1, in which 'knowledge' is the translation of the Greek γνῶσις.

[54] "[partis] rationis ad quam pertinet scientia, id est cognitio rerum temporalium atque mutabilium nauandis uitae huius actionibus necessaria." Augustine, *De trinitate*, XII.17 (371).

a public and common good, which is an immutable good that necessarily has to be dictated by *sapientia*.[55]

Reason alone, therefore, cannot be trusted; *sapientia* should be its guide at all times. Staying with the analogy of Adam and Eve, Augustine explains next that *scientia* and *sapientia* form a kind of rational marriage between action—the accomplishment of the material functions of the body in the material world—and contemplation—partaking of the image of God.[56] Things can go wrong in this interplay of functions, but not necessarily. The goal, in any case, is to fix the mind's gaze—an analogy that will also be exploited in due time—on the eternal things, even if we know we have to live in a material world. *Scientia* thus has a positive aspect: if what *scientia* "inflates" it does under the tutelage of the love for eternal things, then things go well. *Scientia*, in any case, is necessary, for we cannot live in this world without it. In fact, it is necessary for salvation:

> For without [*scientia*] we cannot even possess the very virtues by which we live rightly and by which this miserable life is so regulated that it may arrive at eternal life which is truly blessed.[57]

The difference with *sapientia*, Augustine adds, is that *sapientia* is about the contemplation of eternal things, whereas *scientia* here now taken in a positive

[55] Augustine, *De trinitate*, XII.17 (371–372).

[56] Augustine warns against the identification of the male with mind and the female with body. The analogy works for mind only, which, as he states repeatedly, is in reality just one single thing.

[57] "Sine scientia quippe nec uirtutes ipsae quibus rectae uiuitur possunt haberi per quas haec vita misera sic gubernetur ut ad illam quae uere beata est perueniatur aeternam." Augustine, *De trinitate*, XII.14 (374–75).

light even if belonging to that potentially novice part of reason, is the action by which we use temporal things well.[58] The sense here is not simply, or only, that we can have technical knowledge of nature as in a scientific discipline, but rather that we use nature for the attainment of the good, that is, for the attainment of eternal life.

Augustine will again refine his notions of *sapientia* and *scientia* later on, but before doing that, he introduces his doctrine of illumination, by which he tries to explain the nature of the relation between the human mind and eternal things. This is important, because we want to be sure that *sapientia* is possible. Augustine starts by characterizing eternal things as those entities which have always had, and will always have, the same being; eternal things are in fact immutable and "outside" of time. Even though it seems that they are utterly different in nature to anything human, they are accessible to the human mind just as material things are accessible to the senses: "they remain not like things fixed in space, but as intelligible things with incorporeal nature, yet they are present to the gaze of the mind just as visible things are present to the senses."[59] When the mind grasps these eternal things, Augustine continues, it does so only during a split second, touching them, so to speak, but immediately being thrown back. This is the case, presumably, because the human mind, having a part geared toward the corporeal, is not really capable of engaging

[58] "Distat tamen ab aeternorum contemplatione actio qua bene utimur temporalibus rebus, et illa sapientiae, haec scientiae deputatur," Augustine, *De trinitate*, XII.14 (375).

[59] "Manent autem non tamquam in spatiis locorum fixa ueluti corpora, sed in natura incorporali sic intellegibilia praesto sunt mentis aspectibus sicut ista in locis uisibilia corporis sensibus," ibid., XII.14 (376).

continuously in contemplation of the eternal. In fact, the mind for Augustine seems to be only capable, after all, of having temporal thoughts, and so he adds that by way of that flashing moment of contact, the mind can indeed have a transitory thought of that which is not transitory. This thought can then be committed to memory, and be retrieved later on provided the mind captured it correctly. The mind, in any case, cannot conceive of eternal things except as "attached" to material things. At the end of this section, Augustine gives the example of rhythm, which can be thought of only as long as some singing is heard or perhaps imagined. Rhythm, however, just as harmony and other musical properties, is a mathematical concept independent of time and place. For Augustine, then, the mind can be aware of—it can in fact "see"—rhythm or any other eternal concept, but cannot conceive of it fully in its eternity.

Whatever is retained in memory is, without doubt, a transitory thought that can be organized with other related thoughts and memories in a doctrine or scientific discipline (*disciplina*). Scientific disciplines thus seemingly represent one of the devices through which the mind can preserve contact with the eternal things. This seems to be what ties the liberal arts with *sapientia*. Through those disciplines, especially the mathematical ones, as we have seen, the mind regains contact with the eternal realm, and thus proceeds towards wisdom. There is no indication is Augustine that man needs something else besides intellectual development in order to attain *sapientia*, although in late works he wants to show that the Christian may have an advantage because of what the Christian church has to offer in the way of guidance. There are, how-

ever, a couple of lines discussing *disciplina* later on, in chapter 1 of book XIV, when Augustine tries to explain a quotation from the book of Job regarding *sapientia* and *scientia*. He indicates that in this quotation *scientia* should be taken to mean *disciplina*, which, he says, is a translation of the Greek ἐπιστήμη, and which, being derived from *discendo*, learning, can also be called *scientia*.[60] This seems like an identification of the Aristotelian concept with *disciplina*, and in an indirect way with *scientia*, but Augustine may here be simply copying from a source; he does not cash out on the concept in any important way in his work. Ultimately, the notion of *disciplina* does not have a technical use for him, and thus neither ἐπιστήμη.[61]

To continue with the exposition in Book XII, Augustine pushes forward the analogy with vision and declares that the mind is so constructed as to be able to "see" the eternal things, because eternal things are illuminated in a way analogous to how material things are illuminated. The "eye" of the mind is receptive to that light, to which it is adapted, just as the eye of the body is receptive and adapted to natural light.[62] The analogy is more complicated than it may seem because for Augustine, as for many thinkers in Greek and Roman times, natural vision of material things is not passive. It is not that the

[60]This is presumably because *discendo* seems to be related to *scire*, to know, and thus to *scientia*. This is not the correct etymology of *disco*, but it seems that it was the generally accepted one. More than three centuries later Isidore, would still cling to it, and refer to it repeatedly.

[61]The passage is in Augustine, *De trinitate*, XIV.1 (421–422). The identification of Origen as Augustine's probable source comes from a footnote in the critical edition of the text. Hadot points out that *disciplina* is indeed sometimes used to translate the Aristotelian ἐπιστήμη; it is used notably by Apuleius. See Hadot, *Arts libéraux et philosophia dans la pensée antique*, 77ss. Isidore will refer to *disciplina* and *scientia* in the same terms later on, as we will see.

[62]Augustine, *De trinitate*, XII.15 (378).

eye passively receives light rays to sense objects; rather, the eye also emits rays that touch the object of vision.[63] Thus, the analogy may also help to explain why the mind is not always bumping into eternal things: indeed, the mind has to actively look for them in Augustine's doctrine.

Is it possible to actively look—and to find—the eternal things and to move firmly towards wisdom without help? In principle it is, again, for example, by advancing in the study of purely rational like in the study of mathematics. In practice, however, it seems that for Augustine this is very hard to do. In this work, and others such as *Confessions*, Augustine continuously stresses the need for an active search for God, mostly using the idea of *conversio*, the actual "turning" of one's mind towards God. Even if the mind sometimes, by sheer coincidence or maybe just by curiosity, comes across an eternal thing—the realization that there are eternal relations between numbers and between geometrical objects, for instance—this is not a guarantee that it will move towards *sapientia*. Something else *may* be needed in practice to expedite the process. In book XIII of *De trinitate* Augustine gives us one possibility, namely the conviction that happiness, which seems to be the natural goal for all, is only true in the eternal life, and that that eternal life is only possible through the contemplation of God.[64] Faith provides that conviction, which is only a belief, but this faith Augustine talks about does not seem to be strictly necessary. It does need to be precisely the Christian faith either; any belief that would point

[63]For this conception of vision, see Gareth B. Matthews, "Knowledge and Illumination," in Stump and Kretzmann, *The Cambridge Companion to Augustine*, 175.

[64]See especially Augustine, *De trinitate*, XIII.7 (394–396).

one in the right direction towards God would do. Faith for Augustine seems to mean a heuristic for knowledge. In the *De libero arbitrio*, especially in book II, for example, Augustine guides Evodius from a claim known by faith—for example, that God exists and is the highest being—to a rational understanding of that claim that in turn, makes other claims clearer—for example, that God is also the greatest good. Faith is not necessarily associated with the Christian religion; it is associated with claims that can be true or false, but that are not yet, properly speaking, knowledge.

In book XIV, Augustine comes back to *scientia* and *sapientia* to give some more refinements and clarifications to the concepts. *Sapientia*, he says, can also mean the wisdom of God, which is God itself. This meaning is compatible with what we have already seen, because *sapientia* is, in fact, a partaking of the essence of God. Moreover, *sapientia* is also a synonym for worship of God, something that some people, Augustine notes, call piety. Finally, there is a common, but misleading, definition of *sapientia* that is found in many authors, most notably the writings of Cicero, the source from which Augustine is probably taking it. In this definition, *sapientia* is knowledge (*scientia*) of human and divine things.[65] This is not right. Indeed, Augustine points out, even though in book XII he had said that the cognition (*cognitio*) of divine and human things should be call both *sapientia* and *scientia*, it is necessary to divide this definition so that "knowledge of divine things is properly called

[65] "Sapientia est rerum humanarum divinarumque scientia," Augustine, *De trinitate*, XIV.1 (423).

wisdom, but the name knowledge properly belongs to the knowledge of human things."[66] Moreover, *scientia* is strictly speaking only of good things. Vanity and harmful curiosity are out of the picture. The only things that can be attributed to *scientia* are those "whereby the most wholesome faith, which leads to true happiness, is begotten, nourished, protected, and strengthened."[67] Although this may seem to imply that faith is necessary even for *scientia*, what Augustine seems to have in mind is simply that *scientia* is about advancing towards *sapientia*. Only if this is the case, if *scientia* is knowledge of human things that tend towards the eternal, is *scientia* in fact, compatible with Augustine's view of faith. It is the goal of *sapientia* that is, of the true happiness, that drives *scientia*, and as a matter of fact, as Augustine himself is quick to point out in the very next sentence, "very many of the faithful are not exceedingly strong in this knowledge (*scientia*), although they are exceedingly strong in the faith itself."[68]

Scientia and *sapientia* are thus in a close relationship, with *sapientia* functioning as the target. However, given Augustine's views on faith we have just seen and given the fact that he was, as a bishop in the Christian Church, obviously interested in advancing his creed, it is not surprising that he also tries to tie all back to the specific Christian experience. The study of the lib-

[66] "Ista definitio diuidenda est ut rerum diuinarum sciencia sapientia proprie nuncupetur, humanarum autem propie scientiae nomen obtineat," Augustine, *De trinitate*, XIV.1 (423–424).

[67] "quo fides saluberrima quae ad ueram beatitudinem ducit gignitur, nutritur, defenditur, roboratur." ibid., XIV.1 (424).

[68] "Qua scientia non pollent fideles plurimi, quamuis polleant ipsa fide plurimum," ibid., XIV.1 (424).

eral arts, mathematics especially, can lead one to the knowledge of the divine things, but one can certainly also move towards *sapientia* within the realm of a devout Christian life. Indeed, Augustine claims that *scientia* has a true mission besides just negotiating our life here among the material things, and also in addition helping us know that which man must believe in order to gain a happy, eternal life. Good *scientia* must also tell us how this belief "may help the godly and be defended against the godless."[69] How one does use *scientia* in this manner is explained at length by Augustine in *De doctrina christiana*, a work he started shortly after becoming a priest and having been assigned to Hippo, but left unfinished for around three decades. His views in this work should be taken to be compatible with those of *De trinitate*.

As a priest now, it seems, manuals of the liberal arts such as the ones he started to write a few years before would not suffice. There had to be a truly Christian education, and for Augustine that meant an education based on the Scriptures. In the 12$^{\text{th}}$ century figures like Hugh and Gundissalinus, as we will see, will still divide education in the liberal arts on the one hand and interpretation of Scriptures on the other. Augustine certainly wants his *De doctrina christiana* to be a set of rules for interpreting Scripture, but in the preface he starts by emphasizing the importance of education in general. This is directed against some who claim that interpretation should come directly from God, as a gift. To the proponents of this view, Augustine replies that all of us

[69] "[…] quemadmodum hoc ipsum et piis apituletur et contra impios defendetur," Augustine, *De trinitate*, XIV.1 (424).

need some sort of training. We need, for example, to be able to read and write, and we generally cannot learn these skills by ourselves—somebody has to teach them to us.[70] In fact, even before that, we need to understand and speak our own natural language, and, even though we may not be formally taught how to do this, we need adults around us to acquire a particular natural language.[71] The kind of education Augustine is promoting is indeed no different from teaching somebody how to read: a set of rules through which the student will be able to understand the Scriptures by himself.[72] This education is decidedly Christian, even though pagan knowledge will not be derided per se. However, before stating how this system is going to work out, Augustine makes sure the reader understands what the ultimate goal is.

There exist two types of things, Augustine says: things which are to be enjoyed, (*frui*) and things which are to be used (*uti*).[73] We need to apply ourselves to each thing in the proper way. If we prefer to enjoy things that are meant only to be used, we impede our advance to the things that we should enjoy. Those things are the ones that we love or should love for their own sake, and they are in fact the Father, the Son and the Holy Ghost. God is truly the only thing we should aim for. Everything else is only a tool or a stepping

[70]Teaching here is not simply a transfer of information through words. For Augustine all learning is done exclusively by the student by means of the "inner" teacher which resides in the soul. At most, the external teacher can provide prompts which encourage that learning. This is explained fully in *De Magistro*.

[71]Augustine, *De doctrina christiana*, prooemium, 5 (3). References to *De doctrina christiana* will be to book number, section and page in the standard Latin edition: Augustine, *De doctrina christiana*, ed. J. Martin, Corpus Christianorum Series Latina 32 (Turnhout: Brepols, 1962).

[72]Ibid., prooemium, 9 (7–8).

[73]Ibid., I.3 (8).

stone used to reach Him. God, furthermore, is to be known intellectually, because through our reason we know for certain that God has to be, and is, immaterial and eternal, and therefore out of the realm of the senses.[74] We can see how Augustine's pair *frui*/*uti* here is parallel to *sapientia*/*scientia* in *De trinitate*. We strive for *sapientia* to know and enjoy God, and we do that by means of *scientia*. In order to know and enjoy God, Augustine continues, we need to purify our minds so that we "see" God. This cleansing process is a journey back to our homeland, not through space, but through both good desire to apply ourselves and good character. The road is *sapientia* itself.[75] The vehicle is presumably *scientia*, and we should love it because it brings us to our destination.

He then touches on the role of faith in this pursuit. He explains that faith provides the belief in things we cannot see, and, therefore, it helps us love our destination, even though we have not yet reached it. Thus, faith is here not necessarily Christian faith, but some useful true belief. The problem, apparently, is that we need to somehow have an inkling of what it is we seek, together with the right attitude in order to be willing to put in all the work required to arrive at *sapientia*. We cannot have that pre-knowledge and attitude, unless we believe and love the right things, based on trust in an authoritative source. This is what faith provides. All knowledge (*scientia*) and prophecy are there to serve that faith, but also to increase hope and love (*caritas*). Of these

[74] Augustine, *De doctrina christiana*, I.7–9 (10–12).
[75] Ibid., I.10 (12).

three things, love is the most important. The other two will be replaced by something else when we reach God: faith by the "sight" of a visible reality and hope by real happiness. Love, however will only be increased, for we will not stop loving God, or grow tired of Him, when we know Him.[76] Just as we saw in the discussion of *De trinitate*, even though Augustine may seem to be giving faith an essential role in the path towards *sapientia*, he is just portraying faith as a sort of guide that would let one "look" in the right direction when looking for God. To continue with the analogy, what one "sees" when looking at the direction indicated by faith is not yet clear and distinct, that is, it is not yet fully comprehended and known, it is not yet *scientia*. *Scientia* "serves" faith in the sense that it permits one to go further in the direction of *sapientia*. It is *sapientia* that should ultimately guide the quest for actual intellectual grasping of the eternal things up to God.

The plan for the Christian, however, seems clear to Augustine: we should read and understand the Scriptures—which we can learn to do with the rules in his book—and that will increase our faith and hope, and thus, our love. This then, is the path to *sapientia*. But, Augustine says, a person strengthened by faith, hope, and love has no need for Scriptures, except to instruct others.[77] The Scriptures should be considered, therefore, simply a convenient source of knowledge but not a necessary one. There is another path that Augustine does not explore in *De doctrina christiana*. This is presumably the path that

[76] Augustine, *De doctrina christiana*, I.42, 30.

[77] "Homo itaque fide et spe et caritate subnixus eaque inconcusse retinens non indiget scripturis nisi ad alios instruendos," ibid., I,43(31).

goes through the purely intellectual study of numbers, abstract things, and the like, up to the contemplation of the One. Certainly this second road is not for everybody, at least not for those students only beginning the journey. The problem with it seems to be that the traveller needs to be strong already before starting out. He or she needs to be capable of discerning the true things by himself or herself, without the help of Scriptures to signal the wrong detours and dangers on the road. This alternate road, then, seems to be there for those capable of following it.

The course of study presented next, in any case, is given only with reference to the interpretation of Scriptures, and is mainly composed of the liberal arts. Augustine's only omission is grammar, for which he does not give any alternative. He, however, recommends the study of the original languages of the Bible, Greek and Hebrew. He spends considerable time discussing translation issues, warning that they can give rise to misunderstandings. Other potential sources of problems to which Augustine refers originate from general ignorance of basic topics such as numbers, astronomy, music and the like. Thus the need to study the disciplines of the quadrivium. Some Bible passages referring to numbers intended to be understood figuratively or mystically, Augustine says, and so the reader needs to be aware of their correct interpretation.[78] There is no mention here about the truth of mathematics per se, nor any hint of the possible importance of mathematics for attaining *sapientia* as here Augustine is talking exclusively of the Christian path. However, it seems that

[78]Augustine, *De doctrina christiana*, II.25(50).

even some passages of the Bible need to be understood as expressing truths of mathematics.

There is, on the other hand, a strong statement about logic, which for him, in fact, has not been instituted by humans. Logical connections or inferences (*conexiones*) are not human inventions, but the product of human observation, recording and ordering in such a way that they can be taught or learned; the truth of these connections is "in the eternal nature of things and is divinely instituted."[79] Logic is helpful to understand texts, but there is also the problem of concentrating too much on it, and falling into the trap of wrangling over details or simply trying to trick opponents with sophisms. The student should be careful about all this, and should, as well, be clear on the fact that logical validity does not imply the truth of propositions. In addition to the theory of syllogisms, the student will benefit from the study of definition, division and classification; these things were also not instituted by humans. Simply because these have been traditionally utilized by poets and false philosophers, it does not follow that the Christian student has to be clumsy with his or her concepts.

Augustine also has a generally good opinion of eloquence and rhetoric. Certain of their rules, just like syllogisms, are not of human invention, but the result of simple observation. An example of this would be the rule that states that the expression of love wins over one's listeners.[80] These rules are obviously not useful for understanding a text, but rather to present one's interpretation,

[79]"Ipsa tamen ueritas conexionum non instituta, sed animaduersa est ab hominibus et notata, ut eam possint uel discere uel docere ; nam est in rerum ratione perpetua et diuinitus instituta." Augustine, *De doctrina christiana*, II.50 (67).

[80]Ibid., II.54 (70).

and to win the hearts of others to the Christian faith. He does not explain rhetoric in the same way he explained logic, but rather recommends to the student to study that subject elsewhere, but again with the proviso of always being cautious about pagan influences.

Certainly, one of the goals Augustine has in this work is to show how pagan disciplines can be used by Christians. However little content Augustine explains from the liberal arts he does with examples from the Scriptures, showing thus how a pagan discipline has a role in Christian education. In *Confessions* book I he complains that he had to learn very useful things in the arts with texts of downright condemnable moral value; here he is showing that a Christian can learn the same things without recourse to pagan writing. Pagan knowledge per se is not problematic. Indeed, Augustine deals explicitly with pagan learning, guiding the reader through its complexities. He provides a classification of the pagan disciplines that is based on a radically different way of seeing the origin and relation of the different bodies of knowledge. The traditional classification and ordering of the disciplines of the quadrivium that we saw earlier, for instance, are based both on each discipline's object, and also on its level of abstraction; Augustine in *De doctrina* prefers a hierarchy based on utility and on how the object is known to the learner. Augustine may well endorse the traditional division in a different context, but here he is certainly interested specifically in a Christian education. He divides pagan learning into two major categories: the learning of things discovered by investigation, and the learning of things instituted by humans. In the former, some disciplines

investigate things known through the senses. Among these disciplines, secular history (chronologies), astronomy, and zoology, are useful for the student of the Bible. Other disciplines investigate things known through mental reasoning, as is the case with logic. As for the study of things instituted by humans, one big part of pagan learning is completely made up of superstition, namely everything that has to do with the foretelling of the future, amulets, and so on. Augustine spends several paragraphs discussing the different kinds of superstition. Number mysticism, notably, is not superstitious to Augustine, but is in fact an important part of mathematics. Concerning that which is not superstitious for the pagans, some is simply superfluous and self-indulgent. This includes fictional stories and some visual arts. Other disciplines, on the other hand, are necessary because they contribute to the necessities of life, as for example, social customs. These customs would include not only one related to coinage, weights and the like, but also, social codes of bodily ornamentation and dressing.[81]

Augustine's classification of the sciences is thus entirely based on one of the possible paths that can lead the soul to wisdom, the path that makes use of the Scriptures, and that entails accurate and thorough understanding of the different elements in them. Another alternative is to study mathematics, and indeed, presumably any discipline that puts one in contact with a higher intellectual realm—the realm of Reason with a capital R and beyond—and that eventu-

[81]See Augustine, *De doctrina christiana*, II.29–40 (53–61) for this classification of the pagan disciplines.

ally, perhaps with the help of some guiding true belief—i.e., faith—would lead the way to *sapientia*. The scientific disciplines par excellence of Augustine's time—the liberal arts—are important only insofar as they have a definite role in the attainment of wisdom. They are indeed part, if studied cautiously, of *scientia*. It is precisely that priority assigned to wisdom, and this essentially positive aspect of *scientia* that thinkers in the twelfth century would adopt from Augustine when theorizing about the status of science and scientific disciplines. Many other aspects of their thought they take from Boethius, the figure who most clearly helped acquaint the Latin West with one part of Aristotelian thought. It is to Boethius that I turn now.

1.3 Boethius

About a century after Martianus Capella and Augustine, there seems to have been a resurgence of interest in the preservation of the liberal arts in the Latin Roman world, whose intellectual elite by this time—the sixth century—was Christian. At least two Christian authors in addition to Augustine, Boethius (c.480–524/5) and Cassiodorus (c.485–c.585), produced manuals for the study of the liberal arts. The reasons for this renewed interest might well have been that education was falling into disarray, perhaps precisely because there was no clear and readily available material for students written in Latin for all disciplines. Boethius certainly saw that fewer and fewer people had access to Greek treatises on the liberal disciplines, and thus he set out to translate the

most important works into Latin. He did not complete this project, but what he was able to finish turned out to be, particularly in the case of mathematics and logic, practically all that was available from the Greeks to the early medieval Latin-speaking world. Even fundamental works such as Euclid's *Elements* were essentially lost except for fragments here and there. Boethius was, in fact, the standard advanced reference in mathematics, and serious students would turn to him even after Euclid was available.[82] The same was also the case for logic, as most students would turn to Boethius's commentary on Porphyry's *Isagoge* and on Aristotle's *On Interpretation* and *Categories* for guidance.

Boethius, as mentioned earlier, is ultimately responsible for the term 'quadrivium.' This is a deformation of the word *quadruvium*, which he used to translate the Greek τέσσαρες μέθοδοι of Nicomachus' *Institutio Arithmetica*.[83] The term captures the idea that the mathematical disciplines of the liberal arts curriculum constitute a fourth-fold way to attain knowledge and wisdom. This is, of course, the same idea Augustine had argued for: mathematics represents a kind of knowledge that stands closer to the Truth than other kinds and, thus, one way to reach wisdom is by comprehending the nature of mathematical objects, especially number.

In his translation/paraphrase of Nicomachus' *Institutio Arithmetica*, Boethius, unlike Martianus, ranks Arithmetic first among the mathematical dis-

[82]Even in the thirteenth century, as Guillaumin points out, Jordan of Nemore would publish an arithmetic with clear Boethian influences. Jean-Yves Guillaumin, "Introduction," in *Institution Arithmétique*, by Boethius, trans. Jean-Yves Guillaumin (Paris: Les belles lettres, 2002), lx.

[83]Boethius, *Institution Arithmétique*, trans. Jean-Yves Guillaumin (Paris: Les belles lettres, 2002), I.19.

ciplines. It is not clear whether Martianus is here following a tradition, or is being eccentric in his ordering of the disciplines. Historians, in any case, have tried to provide an explanation for this shift from geometry to arithmetic as the primary discipline, which may have been a Roman phenomenon. Perhaps the Romans looked at the pragmatic side of Greek geometry, and thus paid more attention, for example, to surveying, rather than to theoretical considerations. Thus we see the lack of attention given to Euclid and to the preservation of his writings. Arithmetic once more became important as the Romans shared in the revival of Pythagoreanism, of which Nicomachus is an emblematic figure. Christians would also adopt this view, and were even excited about numerology, as was the case in Boethius's time and beyond. With Euclid's geometry effectively lost, it was Nicomachus's work that was indirectly adopted as the school manual.[84] Several centuries after Boethius, Christians would find arithmetic and astronomy useful for the problem of the computation of the dates of Easter and other feasts, but this came after the fact, when the solid knowledge of geometry that might have spurred further work had already been lost for a long time.

There is, however, a strictly philosophical justification for preferring arithmetic over geometry. It comes from Nicomachus through Boethius's paraphrase. It is not present in Martianus, Augustine, or Isidore, and is relatively simple: arithmetic has the role of a mother in relation to the other sciences, even to the non-mathematical ones. Boethius claimed, as did many

[84]Stahl, *The Quadrivium of Martianus Capella*, 154–155.

thinkers who were influenced by Pythagorean ideas—including Plato and Augustine—that God created the world according to the order of numbers, and the concordance of ratios.[85] The foregoing belief alone would give numbers a certain cosmological importance and precedence. However, even if we disregard this fact, Boethius says, some things are simply prior to others in such a way that

> […] whatever things are prior in nature, if they are destroyed, the posterior things are destroyed together with them, but if what is posterior perishes, nothing would change in the state of the prior substance. This is how animal is prior to human. Indeed, if you take out animal, immediately the nature of human is deleted, but if you take out human, animal will not perish. Conversely, those things which entail something else alongside themselves are always posterior; and those things are prior which, when they are affirmed, do not bring with themselves anything of what is posterior, which is the case, again, of human. For if you say 'human', at the same time you will imply 'animal' because human is also an animal; whereas if you say 'animal', you will not be invoking the species human because an animal is not a human.[86]

[85]Strictly speaking, it was Nicomachus who originally held these views. However, twelfth century readers were not aware of this, and I will continue in my account as if Boethius were the direct reference.

[86]"[…] quod quaecumque natura priora sunt, his sublatis, simul posteriora tolluntur; quod si posteriora pereant, nihil de statu prioris substantiae permutatur, ut animal prius est homine. Nam si tollas animal, statim quoque hominis natura deleta sit; si hominem sustuleris, animal non peribit. Et e contrario ea semper posteriora sunt, quae secum aliud quodlibet inferunt, ea priora, quae cum dicta sunt nihil secum de posterioribus trahunt, ut in eodem

Presumably, according to Boethius, this is the relation between arithmetic and at least some of the mathematical disciplines: arithmetic is ontologically and logically (or perhaps semantically) prior to the rest in the same way that animal is prior to human. However, when Boethius refers explicitly to arithmetic in relation to geometry, he is not talking about the science of arithmetic and geometry per se but rather about numbers and geometrical figures.[87] It is Boethius's contention that numbers are prior to geometrical figures. Strictly speaking, it is the subject matters of arithmetic and geometry that stand in a relationship of priority and posteriority, and it is implied in Boethius's argument that this in itself entails that the disciplines themselves stand in the same relationship.

The same premise is implied in Boethius's arguments for the priority of arithmetic over music and astronomy given in the next two paragraphs of his translation of Nicomachus. Arithmetic is prior to music simply because number, the subject matter of arithmetic, is prior to ratios of numbers, the subject matter of music. The genus x is prior to relations between x's. Additionally, Boethius says, the priority of arithmetic is evident from the names of the musical intervals: the third, for instance, implies the number three. The case of astronomy is also clear, according to Boethius: astronomy is posterior to all the other disciplines. Its subject matter, since it encompasses geometrical figures in motion, is obviously dependent upon geometry, and thus upon arithmetic

quoque homine. Nam si homine dixeris, simul quoque animal nominabis; idem est enim homo quod animal; si animal dixeris, non speciem simul hominis intulisti; non est enim idem animal quod homo." Boethius, *Institution Arithmétique*, I.1.8.

[87]Ibid., I.1.9.

as well. Besides, the motion of the celestial spheres is guided according to harmony, that is, according to musical principles, and so music is also prior to astronomy.[88]

The disciplines of the quadrivium are thus philosophically justified, because they are prior to any other discipline. It is implied in Boethius's text that the path to ultimate knowledge passes through the study of mathematics, this discipline being the proper origin of that ultimate knowledge itself. Yet, Boethius does not use this result to propound a particular, reasoned path of study. In the original Greek, Nicomachus does have the image of mathematics as stairs or bridges from the sensible to intelligible realities, but Boethius does not translate the passage.[89] Also, Courcelle suggests that the image of the ladder between the letters Π and Θ in Philosophy's robe, which appears in the *Consolation of Philosophy*, represents the ascent from practical to theoretical knowledge.[90] This is probably true, given Boethius's Neoplatonic commitments, but it is clear that he does not have a complete philosophy of *sapientia*, as Augustine does.

He does not have an explicit philosophy of scientific disciplines either, but we can safely assume that he accepted Aristotle's precepts on the matter, as given in the *Posterior Analytics*, a work he translated into Latin, and therefore

[88]Boethius, *Institution Arithmétique*, I.1.10–11.

[89]Nicomachus of Gerasa, *Introduction to Arithmetic*, trans. Martin Luther D'Ooge (London: Macmillan, 1926), I.III.3.

[90]Boethius, *Consolatio Philosophiae*, in, *The Theological Tractates : The Consolation of Philosophy*, trans. S. J. Tester, Loeb Classical Library 74 (Cambridge, MA: Harvard UP, 1973), I.I.6. Courcelle is cited in Hadot, *Arts libéraux et philosophia dans la pensée antique*, 69.

must have known rather well. Certainly, this idea that one scientific discipline is prior to another on the basis of the subject matter, might be considered a particular interpretation of Aristotle's notion of subalternation of the sciences.[91] The details of Aristotle's philosophy of science should not concern us at this point, as they were simply unknown to early twelfth century authors in the Latin West, or simply referred to superficially later in the century after Aristotle's text became available.[92]

Latin thinkers in the early twelfth century did not have access to Aristotle's *Metaphysics* either, but, through Boethius, they did have knowledge of the tripartite division of the theoretical sciences Aristotle puts forth in book E. In this book, Aristotle talks about the features of a science that deals with being qua being (ᾗ ὄντα). He begins by briefly recalling that a science (ἐπιστήμη) is about principles and causes, and that it takes as its subject matter a particular kind of thing that it takes for granted and whose essential attributes it tries to demonstrate. He then introduces the case of physical science (φυσικὴ ἐπιστήμη), which deals with a genus of being, namely the sort of substance that contains in itself the principle of motion and rest. This science is neither productive nor practical precisely because its subject matter includes the principles of motion in itself. In productive sciences, like shipbuilding or carpentry, the principle of motion is in the producer, whereas in practical sciences the principle of motion is the will. Therefore, Aristotle says, physical science

[91] See the appendix at page 161 below for an explanation of this.
[92] This is the case notably of John of Salisbury, see page 146 below.

necessarily has to be a theoretical or speculative science. Moreover, physics is a science about that kind of being formulated for the most part only qua inseparable from matter. For we can define essences either as we define 'snub', which implies, and is inseparable from, the idea of a nose, or as we define 'concave', which is independent of perceptible matter. Physical terms are always defined in the sense of 'snub', and that may include, Aristotle claims, even some aspects of the soul.[93]

A bit later in the text, physics is also characterized as dealing with things that are inseparable but not immutable.[94] Here 'inseparable,' given what Aristotle had just said, means "inseparable from matter." Modern readers of Aristotle, however, will notice a major issue at this point. Indeed, most, if not all, modern editions of the Aristotelian text read 'separate' (χωριστά) instead of 'inseparable' (ἀχώριστα). This is because modern editions generally accept a correction of the text attributed to A. Schwegler, a scholar who wrote in the mid nineteenth century. Schwegler's conjecture is that Aristotle wrote χωριστά not meaning "separate from matter" but "existing independently," which is what he means in other places in the corpus where the word is used without any further qualification, as would be the case here. In this view, commentators and copyists would have missed the proper meaning of χωριστά and corrected the text to ἀχώριστα (meaning thus "inseparable from matter") so that the passage make sense.[95] Boethius, certainly, read it that way, as we will

[93] *Metaphysics* 1025b1-1026a7.

[94] *Metaphysics* 1026a14.

[95] See Albert Schwegler, *Kommentar zur Metaphysik* (Tübingen: Fues, 1847), IV.14–16. E. W. Hengstenberg's translation of Aristotle's *Metaphysics* from 20 years earlier (Bonn:E. We-

see shortly.

In any case, Aristotle continues by noting that there is mathematical science (μαθηματικὴ ἐπιστήμη) as well, which is also speculative, but, is not clear to Aristotle at this point in the argument whether its objects are immutable and separate. Some branches of mathematics do consider objects qua immutable and qua separate, and some other branches are about immutable objects, but presumably not separate but as in matter. Therefore, Aristotle concludes, obviously there must be a theoretical science that is neither physics nor mathematics but one prior to both that investigates whether there is a thing eternal, immutable and separate. That science is precisely about immutable, separate objects. That science is divine or theological science (θεολογικὴ ἐπιστήμη), because if the divine is present anywhere it has to be in this kind of entity. Since it deals with the most honourable kind of entity, divine science is also the most honourable science and it has to be preferred over every other. Aristotle, however, is aware of some of the problems with this characterization of divine science. In particular, it is not clear whether it is universal or about a particular genus or entity. Aristotle even grants the possibility that there is no such thing as an immutable, immaterial substance, in which case the first science would be physics. He, however, leaves these issues open and moves on to other considerations in the following sections of book E.

Boethius does not mention these problems. In his clearest statement of

ber, 1824) already presupposes this correction. The great majority of modern commentators agree with Schwegler's interpretation. A few do not, see, for example, Vianney Décarie, "La physique porte-t-elle sur des non-séparés?" *Revue de sciences philosophiques et théologiques* 38 (1954): 466–468.

Aristotle's division of the sciences, he uses this division only to introduce his arguments for the unity of the Trinity, in his *Trinitas unus deus ac non tres dii*, part I of the *Opuscula sacra*. Indeed, the purpose of this short work is indeed to refute the idea that the Trinity means that there are three distinct gods instead of just one. By Boethius's time, this is an old doctrinal problem for Christians, and there had already been many attempts to resolve it, including, notably, Augustine's book which we looked at earlier in this chapter. Boethius claims, in fact, that he is following in Augustine's footsteps, and that he wants to prove that he is a worthy disciple.[96] The arguments in the treatise are given in terms of Aristotelian concepts and presuppose knowledge of the *Organon*. This way of dealing with doctrinal matters can be seen as a clear precursor to what some thinkers—Abelard, for instance—started doing in the late eleventh century. Those thinkers drew from Boethius not only the great majority of their logical concepts and terminology, but also utilized his approach to problems. In that respect, this work by Boethius, together with the rest of the *Opuscula sacra*, which exhibit the same intellectual procedure, have to be considered as the first examples of theology in the prototypical medieval sense.

For the purposes of this dissertation, we need not to be concerned with Boethius's actual use of logic, but only with his rendition of Aristotle's division of the sciences. Before engaging in the actual technical discussion of the trinity, Boethius appeals to Aristotle's notion of theological science to justify

[96]See David Bradshaw, "The Opuscula sacra: Boethius and Theology," in *The Cambridge Companion to Boethius*, ed. John Marenbon (Cambridge: Cambridge UP, 2009), 105–128, especially pp. 106–113 for an introduction to this work.

his approach. He acknowledges Aristotle's division of the speculative sciences and explains it thus:

> There are three speculative parts [of science], natural [science], in motion unabstract (*in motu inabstracta*) [and] inseparable (ἀνυπεξαίρετος) (it considers the forms of bodies with matter, which forms cannot be separated in reality from their bodies) [...] mathematical [science], without motion unabstract (*sine motu inabstracta*) (it investigates forms of bodies apart from matter and therefore apart from motion, which forms, however, being in matter, cannot be really separated from bodies), theological [science], without motion abstract (*sine motu abstracta*) and separable (for the divine substance is without either matter or motion.)[97]

One odd thing about this explanation is that mathematics is described as *inabstracta* instead of *abstracta*, as one would expect. Boethius certainly cannot be talking here about abstraction in the sense of a thought process. He is, in fact, using *inabstracta* to translate the Greek ἀχώριστα, meaning "inseparable from matter" as in the passage from Aristotle discussed two paragraphs back. If we read Boethius's passage again with this meaning in mind, it also becomes clear, from Boethius's short elaboration for each science, that this insepara-

[97]"Nam cum tres sint speculativae partes, naturalis, in motu inabstracta ἀνυπεξαίρετος (considerat enim corporum formas cum materia, quae a corporibus actu separari non possunt, [...] mathematica, since motu inabstracta (haec enim formas corporum speculatur since materia ac per hoc sine motu, quae formae cum in materia sint, ab his separari non possunt), theologica, sine motu abstracta atque separabilis (nam dei substantia et materia et motu caret)." Boethius, *De Trinitate*, in, *The Theological Tractates : The Consolation of Philosophy*, Loeb Classical Library 74 (Cambridge, MA: Harvard UP, 1973), II.5–16.

bility of the objects of physics and mathematics is ontological, that is, that those objects cannot be separated from matter *in reality*.[98] Be that as it may, in *De trinitate*, Boethius just wants to conclude that since theology deals with Being without motion and matter, its proper method is to apprehend pure form. Thus the approach he takes on the problem of the trinity in the rest of the treatise. He only uses the word *theologia* to transliterate the Greek, and then reverts back to the Latin *divine* to describe what he is trying to do in this work. Theology is not yet, after all, the distinct discipline it will become in the thirteenth century, but we see here the first hints of a justification for its priority over the rest of the disciplines. Boethius's purpose here is, however, definitely not to say that this kind of technical treatment of Christian material is somehow prior to other types of intellectual activity. Rather his goal is to show that the proper way of dealing with divine things is through the use of purely intellectual concepts. His making of the trinitarian problem one to be solved in the realm of Aristotelian divine science does not seem to represent for him a particularly troublesome philosophical issue.

In other texts, Boethius introduces Aristotle's tripartite division of the sciences using a language that draws heavily on the Neoplatonic tradition. In his minor commentary on Porphyry's *Isagoge*, before getting into the actual subject matter and as is customary for Neoplatonic commentators, he deals with basic questions about the status of logic. He begins by characterizing

[98]Boethius's use of the word *inabstracta* also confused some later thinkers, especially those from the so-called School of Chartres. See Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 39–41 for a discussion of the responses in the twelfth century. This passage is also problematic in Gundissalinus, who misquotes it. See page 129 below for details.

philosophy as the love of wisdom, not of wisdom related to the arts and the ways of fabricating things, but of wisdom related to the primary, enduring reason of things. He then proceeds to explain the Aristotelian division of the sciences by stating that philosophy has two species, theoretical and practical, also known as speculative (or contemplative) and active. Following Aristotle, Boethius divides theoretical philosophy into three parts. These should presumably correspond to theology, mathematics and physics, but Boethius only talks about theology explicitly. The other two parts are characterized in different terms. The three parts of theoretical philosophy, Boethius says, are about the "intellectible", the intelligible and the natural. 'Intellectible' is a word he confesses to have coined in order to translate the Greek νοητόν. The intellectible, Boethius explains, is "that which, ever enduring of itself, one and the same in its own divinity, is not ever apprehended by any of the senses, but by the mind and the intellect alone."[99] The science that deals with the intellectible is exactly, Boethius says next, what the Greeks refer to as theology, and which investigates such things as the contemplation of God and the incorporeality of the soul. The object of the second part of the theoretical sciences, the intelligi-

[99] "Νοητά, inquam, quoniam Latino sermone numquam dictum repperi, intellectibilia egomet mea uerbi compositione uocaui. Est enim intellectibile quod unum atque idem per se in propria semper diuinitate consistens nullis umquam sensibus sed sola tantum mente intellectuque capitur," I.03.8 The critical edition of the text is included in Boethius, *Anicii Manlii Severini Boethii In Isagogen Porphyrii commenta*, ed. G. Schepss and S. Brandt, Corpus scriptorum ecclesiasticorum Latinorum (Vienna: F. Tempsky, 1906). The translation of this section is based on Taylor's. The Latin text is quoted verbatim by Hugh of St. Victor in the *Didascalicon*, book II, at different places in chapters 2 and 3. See Hugh, *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*, 62–3. For a brief discussion of this section see Leen Spruit, *Species Intelligibilis: I. Classical roots and medieval discussions* (Leiden: Brill, 1994), 100 and M.-D. Chenu, "Imaginatio : Note de lexicographie philosophique médiévale," in *Miscellanea Giovanni Mercati Vol II* (Vatican City: Biblioteca Apostolica Vaticana, 1946), 597.

ble, on the other hand, Boethius says, comprehends the first, the intellectible, in virtue of its own thinking and intelligence.[100] The intelligible has to do with the celestial works of the divinity, with sublunary beings endowed with mind and purer substance, and with human souls. All these, Boethius says, were originally intellectible substance but degenerated to the level of the intellegible through contact with the corporeal. As a result, unlike the intellectibles, they are less objects of understanding than active agents who would find greater happiness if they directed their attention to the study of things intellectible.[101] The third part is about bodies and the knowledge and cognition of them. This is "physiology," Boethius says, which is the science that explains the natures and attributes of bodies.[102] Boethius clearly proposes a hierarchical division of the theoretical sciences, based on a sort of descent from the intellectible down to the corporeal. The scheme is completed with the practical sciences, which he divides, following Aristotle once again, into ethics, private affairs (household economics) and public affairs (politics).

Boethius, however, dropped this issue altogether in his second version of the commentary of the *Isagoge*, where he skipped the division of the sciences, and dealt right away with logic. In both commentaries, logic is presented both

[100] "Secunda uero est pars intellegibilis, quae primam intellectibilem cogitatione atque intellegentia comprehendit." I.03.8. Here I understand "pars" to refer not the part of the sciences but to the object of the sciences of the second kind.

[101] "Quae est omnium caelestium supernae diuinitatis operum et quicquid sub lunari globo beatiore animo atque puriore substantia ualet et postremo humanarum animarum quae omnia cum prioris illius intellectibilis substantiae fuissent corporum tactu ab intellectibilibus ad intellegibilia degenerarunt ut non magis ipsa intellegantur quam intellegant et intellegentiae puritate tunc beatiora sint, quotiens sese intellectibilibus applicarint. " I.03.8–9.

[102] "Tertia theoretices species est quae circa corpora atque eorum scientiam cognitionemque uersatur: quae est physiologia, quae naturas corporum passionesque declarat," I.03.9.

as a tool, and as an integral part of philosophy. Both this peculiar division of the sciences and the status of logic will be picked up by thinkers such as Hugh of St. Victor. For example, Hugh quotes and elaborates on most of Boethius's explanation of intellectibles and intelligibles in the course of his own characterization of the Aristotelian tripartite division of the theorical science. We will see that in the next chapter.

1.4 Isidore

To complete this picture of early thought about science and scientific disciplines, I now turn to the other author who stands out as a major influence in the Middle Ages after Boethius. Even if not providing much, if anything, in the way of justification for his assertions, and usually only giving paraphrases and direct quotations from unreferenced sources, Isidore of Seville's encyclopedic work was widely distributed and read. His *Etymologiae* from the early seventh century was indeed the most important reference work for students.

After Boethius and before Isidore, however, scholars usually mention the name of Cassiodorus as an important figure. A contemporary of Boethius, Cassiodorus would be important not because of his theoretical positions but, rather, as a sanctioner and preserver of the liberal arts for Christian education. He certainly sanctioned the liberal arts, but essentially in the same terms as Augustine. The extent of his role in the preservation of the secular arts is, on the other hand, uncertain. Scholars in the early twentieth century thought he

was the key figure in the preservation both of the idea of a secular education for the Christians, with his *Institutiones*, and of the actual texts with the ample library he allegedly assembled at his monastery. Nowadays, this prominent role is contested and it is not even clear that his work was read directly by thinkers in the twelfth century.[103] Cassiodorus, however, does serve as a middleman of sorts in the preservation of some texts, as a number of his quotations and paraphrases are, in turn, copied by Isidore. This is the case most notably for part of the text regarding the notions of science, art, and discipline. Readers in the twelfth century, of course, were oblivious to this path of preservation.

Isidore's *Etymologies* certainly has an encyclopedic character, touching on a variety of subjects. Of the twenty books that compose the work, only the first three deal with the seven liberal arts. The remaining seventeen books touch on medicine, law, the Scriptures, and many other matters of all kinds, from shipbuilding and agriculture. However, only the liberal arts are introduced as disciplines or sciences; the rest of the subjects are presented sometimes just as arts, and sometimes simply as subject matters, without indication of their status. The work in fact starts with an explanation of the difference between art and discipline. The noun '*disciplina*', Isidore says, comes from '*discendo*', learning, and since knowing (*scire*) is only possible by learning, *disciplina* can also be called *scientia*. Art, on the other hand, consists of rules and precepts.[104]

[103]For an account of Cassiodorean scholarship of the past one hundred years see Mark Vessey, "Introduction," in *Institutions of Divine and Secular Learning and On the Soul*, by Cassiodorus, trans. James W. Halporn (Liverpool: Liverpool University Press, 2004), 79–97.

[104]"Disciplina a discendo nomen accepit : unde et scientia dici potest. Nam scire dictum a discere, quia nemo nostrum scit, nisi qui discit. [...] Ars vero dicta est, quod artis praeceptis regulisque consistat," Isidore of Seville, *Isidori Hispalensis Episcopi : Etymologiarvm sive*

We have then the identification of *disciplina* with *scientia*, something we had already seen Augustine doing in passing. As noted for Augustine, probably through the intermediary of Apuleius or perhaps Victorinus, the Aristotelian technical term ἐπιστήμη gets translated as *disciplina*.[105] It finds its way into various texts, but there is no indication, at least for Augustine and Isidore, that these authors understood its origin and technical significance in an Aristotelian context. The fact that only the liberal arts get treated as *disciplinae* perhaps only serves to show their traditional higher status.

Isidore explains the difference between discipline and art in a little more detail, quoting Cassiodorus almost literally:

> Between art and discipline Plato and Aristotle wanted the following difference to exist: they say that art is found in things that can be otherwise, whereas discipline is about things about things which cannot come out otherwise. Because when we deal with true discussions, there will be discipline, but when we deal with something that is [only] probable and in the realm of opinion, we will call it art.[106]

This distinction, although ascribed to Plato and Aristotle, is mostly Aristotelian and can be found in the *Nicomachean Ethics* where Aristotle deals

originvm libri XX, ed. W.M. Lindsay (Oxford: Oxford UP, 1911), I.1.1. This etymology, also used by Augustine (see 44 above), is not right.

[105] See page 43 above.

[106] "Inter artem et disciplinam Plato et Aristoteles hanc differentiam esse voluerunt, dicentes artem esse in his quae se et aliter habere possunt; disciplina vero est, quae de his agit quae aliter evenire non possunt. Nam quando veris disputationibus aliquid disseritur, disciplina erit : quando aliquid verisimile atque opinabile tractatur, nomen artis habebit." Isidore, *Etymologiae*, I.1.3.

with the soul's different intellectual activities.[107] It is certainly compatible with Aristotle's views on ἐπιστήμη in the *Posterior Analytics*. Again, since there is no further elaboration, Isidore's readers were not aware of the connection with Aristotle. Besides, Isidore does not follow a strict terminology in his work, sometimes calling particular liberal arts simply arts, sometimes sciences, and sometimes disciplines.

Isidore, however, comes back to these distinctions later on, after dealing with rhetoric, and before starting to talk about dialectics. He has a short section, taken almost verbatim from Cassiodorus, on the differences between these two disciplines[108] and then introduces a relatively large section on the definition of philosophy. Here Isidore presents three different versions of the division of philosophy, not making any effort to reconcile them, or even to explain where they come from. In the first version, philosophy is taken to be the cognition (*cognitio*) of human and divine things, together with the striving towards good living. This consists of science (*scientia*) and opinion, science taking place when things are perceived as certain. This division seems then to follow the distinction between science and art just described, and, in fact, corresponds to the Ciceronian definition Augustine had refuted.[109]

The second version is of Stoic origin.[110] There are three species of philosophy: natural, moral and rational, called physics, ethics and logic in Greek.

[107]Aristotle, *Nicomachean Ethics*, III.3, from 1112a31 specially.
[108]Section II.XXII, corresponding to *Institutiones* III.2
[109]See 46 above.
[110]This is pointed out by Hadot, whose work I am using extensively in this paragraph and the next. See Hadot, *Arts libéraux et philosophia dans la pensée antique*, 210–212 and 299–301.

Physics is about looking for the cause,[111] and was divided by Plato into the four disciplines of the quadrivium. Ethics, founded by Socrates, deals with the way and order of living, and is divided into the four virtues of the soul: prudence, justice, fortitude, and temperance. Logic, added by Plato after investigating the discussions of physics and ethics, deals with the rational value of those discussions, and is divided into rhetoric and dialectic. Moreover, Isidore says, the Scriptures deal with these three subdivisions as welll for instance, Genesis deals with nature, and Proverbs with moral issues.[112] In this view, that Isidore simply puts forth without explanation, Plato is thus considered the organizer of the philosophical corpus, of which six of the seven liberal arts account for two of the three main divisions. Isidore probably used a number of different sources, but there seems to be a strong connection to Augustine here. Augustine had indeed put forth a similar Stoic account as well in *Contra academicos* III.17. In fact, the identification of the three subdivisions of philosophy with the Scriptures seems to follow the lead of Augustine's identification of those same subdivisions with God in *De civititate Dei* book VIII. This division of the sciences, however, does not seem to be of structural importance for Augustine's philosophy.

The third division of philosophy, which Isidore introduces without pause in the same paragraph as the other two, is radically different. He takes it verbatim from Cassiodorus, who according to Hadot took it from Origen, although

[111] "In Physica igitur causa quaerendi," Isidore, *Etymologiae*, II.24.4.
[112] Ibid., II.24.3–8.

in a corrupted way.[113] Philosophy can be *inspectiva* or *actualis*, which corresponds to Aristotle's division of intellectual activities into theoretical and practical. "Inspective" philosophy is divided in turn into natural, doctrinal, and divine philosophies. Doctrinal philosophy is, without doubt, the same as mathematics; *doctrinalis* is indeed a translation into Latin that closely follows the etymology of the Greek μαθηματικὴ. It is divided, Isidore continues, into the four quadrivial arts, and deals with abstract quantity, that is, with things separated from matter by the intellect. For the conception of theoretical philosophy, and of its other two subdivisions Isidore's—i.e., Cassiodorus's—source deviates from Aristotle. Now clear Neoplatonic elements are introduced, in fact, something resembling Boethius's division of philosophy in the commentary to Porphyry's *Isagoge*. Theoretical philosophy, Isidore writes, is that by which we go beyond the visible world, and contemplate something divine and heavenly with the mind alone.[114] Natural philosophy investigates the nature of each thing, as nothing comes into life without following the precepts defined by its creator.[115] Divine philosophy deals in great depth with the ineffable nature of God, and, in part, with spiritual creatures.[116] Finally, practical philosophy is divided, in Aristotelian fashion, into ethical, private and civil, dealing, in order, with the proper way of living, the proper way of arranging private affairs,

[113]Hadot, *Arts libéraux et philosophia dans la pensée antique*, 299–301.

[114]"Inspectiva dicitur, qua supergressi visibilia, de divinis aliquid et caelestibus contemplamur, eaque mente solummodo inspicimus," Isidore, *Etymologiae*, II.24.13.

[115]"Naturalis dicitur, ubi uniusquisque rei natura discutitur, quia nihil generatur in vita sed unumquodque his usibus deputatur, in quibus a creatore definitum est," ibid., II.24.11.

[116]"Divinalis dicitur quando aut ineffabilem naturam Dei, aut spirituales creaturas ex aliqua parte, profundissima qualitate disserimus," ibid., II.24.13.

and the proper way of governing a state.

Again, Isidore only mentions these ways of dividing philosophy, without attempting to reconcile them. He then goes on to present the rest of the disciplines and arts—mostly in a very superficial way—and indeed not going into much greater detail than Martianus had. He does not go back to the issue of the proper place of the disciplines in these schemes. Isidore can in fact be seen mainly as a repository of quotes, albeit an important one, for most laters medieval authors.

After Isidore, in the ninth century a number of other writers—Alcuin, Raban Maur, Erigena—dealt with the issue of the division of the sciences, but did not exert any noticeable influence to twelfth century writers.[117]

⋆⋆⋆

The picture we get from this chapter's discussion demonstrates a long tradition of liberal arts education that, however, was based on a rather meager provision of materials. The disciplines of the trivium are unquestionably much better represented than those of the quadrivium, even though the mathematical arts are considered extremely important to Augustine and Boethius, those two most influential of figures. With regard to thought about scientific knowledge, the only fairly complete account we have is that of Augustine, which can be

[117]Raban Maur, a disciple of Alcuin, basically copied Isidore's texts. See Raban Maur, *De universo*, ed. J. P. Migne, Patrologia Latina, 111: 9–612 (Paris: Garnier, 1864), 411ff. John Scot Erigena presents a more explicit and coherent account in his *Peryphiseon* or *De divisione naturae*. See John Scot Erigena, *De divisione naturae* (Dublin: Dublin Institute for Advanced Studies, 1968), especially books III and IV. A basic description of these works can be found in Mariétan, *Problème de la classification des sciences*, 107–132.

summarized in the idea of *scientia* referring to a necessary element in the quest to *sapientia*—wisdom, the ultimate goal for all humans. The way to attain wisdom consists, generally speaking, in moving away from the corporeal, and getting to know the higher realm of the spiritual. Thus one moves higher and higher until eventually arriving at contemplating God. Mathematics is one way of doing this, given that number is, for Augustine, the most distant from the corporeal that we can get. But the path to wisdom is very arduous, and, in all likelihood, wisdom seekers should rely at the beginning of their journey on some truths they need to accept without proof—by faith—in order to find the proper way. Eventually, however, those beliefs should be replaced by *scientia*. Christians have the option of using Sacred Scriptures to gain access to some of these truths, provided they learn how to properly interpret the texts. For Augustine, it seems that any discipline that helps in the quest towards wisdom is worth pursuing, but in *De doctrina christiana* he specifically sanctions and classifies those that he thinks are necessary for a correct understanding of the sacred texts. Boethius, on the other hand, while also establishing the priority of the mathematical disciplines within the liberal arts, provides the Latin West rather with a couple of versions of the Aristotelian division of the sciences. It will be up to later thinkers to try to reconcile all these ideas, from the outset, and for what proved to be a long time afterward, without recourse to other Aristotelian texts besides the Organon. How a number of important authors in the twelfth century proceeded, we will see in the next chapters.

Chapter 2

Hugh of St. Victor

In this chapter I study the notion of *scientia* in what constitutes the most explicit and sophisticated account of that concept in the Latin West before the dissemination of the scientific works of Aristotle: the writings of Hugh of St. Victor, especially the *Didascalicon*.[118]

No other author of the time—early twelfth century—tries to offer, as Hugh does, an account of how the scientific disciplines fit together within a theory of knowledge, and how and why they need to be studied. At first look we might be tempted to think that Hugh is just an odd figure in this respect. However, after a quick look at the intellectual developments in the century or so before Hugh reveals that the problem of education and the scientific disciplines was not an unimportant issue.

In the intellectual life of the Latin West the eleventh and twelfth century

[118]See Baron, *Science et sagesse chez Hughes de Saint-Victor*, vii–xlviii for a study of the texts attributed to Hugh and their chronology. For a more recent introduction to Hugh see Paul Rorem, *Hugh of Saint Victor* (Oxford: Oxford UP, 2009).

are characterized by the professionalization of the study of the Scriptures, what at the time was called *pagina sacra* and what would become the foundation for scholastic theology in the thirteenth century and beyond. Education in the interpretation of the Scriptures, needed for the instruction of priests and monks, was done traditionally in schools associated with big churches, cathedrals and monasteries. While this continued to be the case for a long time, some masters became more or less independent. They would teach at their own schools, and use intellectual tools and methods based on the study and development of dialectics. The typical master at the end of this period was neither a bishop nor a monk; he was in a way disassociated from the life of the Church and his job was focused on the study and teaching of the sacred doctrine.[119] The master will become later, in the thirteenth century, one of the important elements in the constitution of the university, but already around the mid eleventh century, especially in Paris, we see the beginnings of this educational structure. Learning centres stop being associated only with a cathedral and now are all in or around a town or small city, which starts to depend to some extent on this new population of students who have come from far-flung places. The formation of the university is indeed, as many authors point out, a phenomenon closely related to the development of urban life. In Paris, and in towns around the city, several schools are founded in this period

[119]For an account of the rise of the masters, see M.-D. Chenu, "Les Magistri. La "science" théologique," in *La Théologie au douzième siècle* (Paris: Vrin, 1957), 323–350. To be sure, some figures do not fit this profile, as is the case of Anselm of Canterbury, who did not follow the career path of a typical master. For an overview of developments in the twelfth century see F.C. Copleston, *A History of Medieval Philosophy* (London: Methuen, 1972), 86–103.

with students sometimes moving from one to the other, as they follow a popular teacher. The school of Notre Dame is well known; Peter Abelard studied there under William of Champeaux, who was the school's first important master. An important school town was also St. Geneviève, where Abelard taught for a while as well and which, after the 1150s, became a centre of Augustinian thought in response to the new influx of Aristotelian ideas. A third important school was at St. Victor, which was founded in 1108 by the same William of Champeaux of Notre Dame, and where we find Hugh as a master several years later.[120]

In parallel with these educational development, the actual study of the Scriptures starts to become more technical due mainly to the parallel developments in dialectics. Anselm is usually consider a turning point figure in this with his (Augustinian) view of faith seeking understanding.[121] Once we reach Paris at the turn of the twelfth century, we have people like Abelard explicitly and deliberately applying dialectical methods to deal with issues of doctrine. Others have applied those methods but not that openly and without defending them as vehemently as him. He is also the first thinker to start using the word 'theology' to refer specifically to what he was doing, paving the way for theology to become a distinct intellectual discipline. By this time dialectics has been developing for quite a while. In the tenth and early eleventh century, thinkers in the Latin West started to develop a keen interest and a more

[120]For a more detailed but still concise account of the developments in Paris in this period see Pedersen, *The First Universities*, 129–133.

[121]This is one of the major points in G.R. Evans, *Anselm and a New Generation* (Oxford: Clarendon Press, 1980).

solid understanding of Aristotelian logic. Before this period logic was studied mainly from the pseudo-Augustinian treatise *Categoriae Decem*, but by the beginning of the eleventh century Boethius' translations and commentaries of the more advanced *Categories* and *De Interpretatione* were the preferred texts.[122] There is not much evidence as to exactly how this interest and understanding developed nor how logic and dialectics was taught. Nevertheless, thinkers like Abbo of Fleury (d.1004) and Gerbert of Aurillac (d.1003), for example, already show proficiency in the theory of categorical and hypothetical syllogisms, and by Abelard's time there are even sophisticated controversies as to how to interpret Aristotle's logic, like the dispute between nominalism and realism.

Even though generally speaking figures like Abelard took for granted that the pagan disciplines—which they start to identify as Greek—are applicable and highly desirable, perhaps even indispensable, to the study of the Christian faith and the correct interpretation of the Scriptures, others were not that enthusiastic about it. One influential view in twentieth century scholarship is that, in fact, we can talk about an extended controversy or dispute between two camps of religious and intellectual figures. Some of them are for the use of dialectics and some are against.[123] In this view and with regards specifically to

[122]John Marenbon, *Early Medieval Philosophy* (London: Routledge, 1988), 80ff. Marenbom offers an excellent, concise introduction to this period.

[123]The idea of a controversy between dialecticians and anti-dialecticians was introduced first at the beginning of the twentieth century by the German scholar J.A. Endres. See J.A. Endres, "Die Dialektike und ihre Gegner in 11. Jahrhundert," *Philosophisches Jarhbuch* 19 (1906): 20–33. Paré uses more categories to catalogue the different thinkers humanists vs. anti-humanists, utilitarians, religious reformers, scientists, dialecticians, etc. See Paré, Brunet, and Tremblay, *La renaissance du XIIe siècle*, 169–206.

the twelfth century, Abelard would be portrayed as one, if not *the*, emblematic figure of the pro-dialectics faction. The figures of the anti-dialectics camp, on the other hand, are less easy to understand and place in the context of this alleged controversy, as it is not clear whether some of them were actually against dialectics per se.[124] Be that as it may, what is clear is that there were a variety of attitudes regarding the use of dialectics, and in general of pagan disciplines, in the realm of Christian doctrine and dogma.

At times these attitudes clashed and so we have a number of writings defending the different positions. One of the most famous examples is the controversy over the Eucharist that set Berengar of Tours (c.1000–88) against Lanfranc (d.1089) and that spanned over 30 years, included Berengar having to publicly retract of his view, and spilled over to other thinkers. It is actually very difficult to determine what were exactly each party's views and how they developed over time. The general issue is that according to Berengar, it seems, it is simply absurd and against common reason to believe that there is a thing with all the accidents of bread that is not bread, as it would be the case with consecrated bread during the Eucharist. This of course, goes against the doctrine of transubstantiation, and so Lanfranc accused him of disregarding authority and faith. In any case, what is interesting of this controversy for our purposes is that Berengar actually praised logic and maintained that to turn to dialectic is to turn to reason. Lanfranc, on his part, does not seem to be

[124]This is Copleston position. He does not think that there was a real controversy. See Copleston, *A History of Medieval Philosophy*, 65–68.

against logic or dialectics per se but against using them for issues that belong to faith alone.[125] An attitude similar to Lanfranc's can be found also in Peter Damian, who defended God's omnipotence against people who think that were some things God could not do simply because they would go against reason.[126] Already at the turn of the twelfth century we have also Rupert of Deutz, who insisted on keeping the mysteries of faith as mysteries preferring exposition of the issues by means of allegories and analogies instead of logical analysis.[127]

The challenge these contrarian voices raise to thinkers who do place some value in the intellectual investigation of the issues of faith is precisely to justify the Christian worth of the intellectual enterprise. Abelard would take it simply for granted that intellectual investigation is the way to proceed. He would also subscribe to the view that pagan writers such as Plato were already following God's precepts by displaying and defending Christian virtues, and that, in fact, many of the issues in Christian doctrine could be found in their writings.[128]

[125]For a description of this controversy see C. Radding and F. Newton, *Theology, rhetoric, and politics in the Eucharistic controversy, 1078-1079: Alberic of Monte Cassino against Berengar of Tours* (New York: Columbia University Press, 2003), 1–32. Coppleston also refers to it briefly, see Copleston, *A History of Medieval Philosophy*, 65–66. Berengar's praise of logic is in Berengar of Tours, *De sacra coena adversus Lanfrancum*, ed. A.F. and F.Th. Vischer (Berlin, 1834), 101.

[126]See Peter Damian, *Lettre sur la toute-puissance divine [De divina omnipotentia]*, Latin and French, ed. and trans. André Cantin (Paris: CERF, 1972). Recent studies of this work include Toivo J. Holopainen, *Dialectic and Theology in the Eleventh Century* (Leiden: Brill, 1996) and especially Irven Michael Resnick, *Divine Power and Possibility in St. Peter Damian's De Divina Omnipotentia* (Leiden: Brill, 1992). In the rest of this paragraph I am drawing from this secondary literature.

[127]Rupert wrote extensively against people like Anselm of Laon and William of Champeaux. See Rupert of Deutz, *De voluntate Dei*, ed. J. P. Migne, Patrologia Latina, 170: 437–54 (Paris: Garnier, 1854) and Rupert of Deutz, *De omnipotentia Dei*, ed. J. P. Migne, Patrologia Latina, 170: 453–478 (Paris: Garnier, 1854). He is taken to be the paradigmatic example of the "old" way of doing theology. See for instance R.W. Southern, *Scholastic Humanism and the Unification of Europe, Volume II: The Heroic Age*, with notes and additions by Lesley Smith and Benedicta Ward (Oxford: Blackwell, 2001), 7–24. Evans uses him to draw a distinction with Anselm at several points in Evans, *Anselm and a New Generation.*

[128]This is not Abelard's view only. As Gregory explains, the normal approach for twelfth

Hugh will go beyond this. Certainly, it is in the context of this ongoing discussion about the place of the pagan teachings and disciplines that we can partly make sense of Hugh's decision to write a work like the *Didascalicon*, where he spells out the relationship and origin of the different intellectual disciplines of his time.

The *Didascalicon*, written in the late 1130s,[129] seems to be directly addressed to present and future students of his school, but his extensive justification and description of disciplines not having to do with Scriptures—more than half of the work—suggests that he also had a wider audience in mind, an audience in need of a proper account of how the different traditional, pagan disciplines fit together for Christians. The work is generally placed within the tradition of educational programmes or guides for students we saw in in the first chapter of this dissertation, works such as Cassiodorus's fifth century *In-*

century commentators when reading works such as the *Timaeus* was to check the accuracy of several themes from the Augustinian tradition against Plato's text, which was taken to be composed of allegories and fables, just as the Bible is. It was taken for granted that those themes were accurate and that Plato's text needed clarification. The task of the commentator was therefore to uncover the hidden philosophical and religious truths and meanings behind the *integumenta* (coverings) and *involucra* (wrappings) in the text. See Tullio Gregory, "The Platonic Inheritance," in *A History of Twelfth-Century Western Philosophy*, ed. Peter Dronke (Cambridge: Cambridge UP, 1988), 60–62. For Abelard's praise of the pagan authors see, for example, Abelard, *Theologia christiana*, ed. E. M. Buytaert and C. J. Mews, Petri Abaelardi opera theologica: Corpus christianorum continuatio mediaevalis XII (Turnhout: Brepols, 1969), 2.38. For Abelard's view that some Christian themes were already in the pagans see Abelard, *Theologia Summi Boni*, ed. E. M. Buytaert and C. J. Mews, Petri Abaelardi opera theologica: Corpus christianorum continuatio mediaevalis XIII (Turnhout: Brepols, 1987), 1.36–38.

[129]The critical Latin edition of this work is Hugh of St. Victor, *Hugonis de Sancto Victore Didascalicon : de studio legendi*, ed. Charles Henri Buttimer (Washington, DC: Catholic University Press, 1939). There is an English translation: Hugh of St. Victor, *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*, trans. Jerome Taylor (New York: Columbia UP, 1961).We do not have an exact date for the composition of the work. Baron puts together with *De Sacramentis* as probably the last two works Hugh ever wrote (see Baron, *Science et sagesse chez Hughes de Saint-Victor*, xlviii) and Hugh died in 1141 (Rorem, *Hugh of Saint Victor*, 9–11).

stitutiones, Martianus Capella's *Marriage of Philology and Mercury* and, even earlier, Varro's lost work *Disciplinarum Libri IX*. As we saw in that chapter, these works are for the most part mere descriptions of the different disciplines, especially those of the classical liberal arts, with only minimal classification. The *Didascalicon*, on the other hand, not only lists the different disciplines, but also provides a thorough explanation for their origin and classification, together with a justification for their appropriateness for the Christian student. In the latter it is comparable to Augustine's *De doctrina christiana*, to which it may be considered an update, but the way in which Hugh sets up the different disciplines is radically different from Augustine's views in that work.

The *Didascalicon* starts with a preface in which Hugh defends the idea of learning. He charges against those who think that learning may be impossible for the not so bright and simply futile for the rest. He is most probably responding to the voices contrarian to *scientia* and dialectics like the ones mentioned above. To them Hugh replies that the truth is that there is no excuse for not learning or least trying. Even the less talented can benefit from learning if only so much, Hugh says. Those who can easily learn but decide not to are simply despicable: "not knowing comes from weakness, but to hate knowledge comes from a wicked will."[130] The reason why acquiring knowledge (*scientia*) is important will become clear in the first chapters of Book I, as we will see later on.

[130]"Nescire siquidem infirmitatis est, scientam vero detestari, pravae voluntatis," Hugh, *Didascalicon*, preface, 1.16–17. References to the *Didascalicon* are given as book and section (in this case, the preface), followed by page and line numbers in Buttimer's Latin edition. Translations from this work are based on Taylor's English version with some emendations.

The work is indeed a manual for students. Its purpose is to teach Christians how to acquire knowledge. There are two ways, Hugh claims in the preface, in which someone can be instructed to acquire knowledge: reading (*lectio*) and meditation. The *Didascalicon* is about reading, which includes in its meaning not only actually reading a text but also taking lessons, and which comes before meditation in teaching. The work is meant to give students the precepts for successful reading: a guide on what to read, in which order and how.[131] However, Hugh does not say at any point that reading is *required* to acquire knowledge. Knowledge may come also, for example, from natural, not instructed, intellectual activity. This can be gathered from Hugh's theory of knowledge.

Hugh provides a detailed analysis of the process through which knowledge comes about in his short treatise *De unione corporis et spiritus.* All knowledge is some sort of purification of being that happens at all levels, from the corporeal up to the divine. Hugh presents his theory describing first how knowledge of the material is accomplished. The verse from John 3:6, "what is born of flesh is flesh, and what is born from spirit is spirit," serves Hugh to introduce the idea that there has to be a medium between the material and the spiritual so that they can convene at some point, like they do, for example, in the normal activity of man. Since there is a great distance—Hugh does not say an *insurmountable* distance—between body and spirit, there has to be something by means of which the body ascends (for the body is lower) to come near

[131]Hugh, *Didascalicon*, Preface, 2.9–15.

the spirit and something by means of which the spirit descends to approach the body.[132] Hugh indeed affirms that there is a scale of beings, starting with lower and higher bodies, then lower and higher spirits above bodies, and finally God as the supreme being. For him, however, there is something akin to an overlap in the ranks. Some bodies, for example, are of so high rank that they are almost transcendent, almost spirit. Conversely there are spirits of such a low rank that they are almost corporeal. It is the confluence of those high bodies and low spirits that makes possible the communication between the two kinds of entities.[133] Also needed for that communication to happen is the capability of a particular entity or parts of an entity, be it corporeal, spiritual or divine, to ascend or descend. According to Hugh, sense perception (*sensus*) is precisely that by means of which the corporeal ascends. Conversely, the spiritual descends to the corporeal by means of sensuality (*sensualitas*). What can happen between body and spirit can also happen between spirit and God. Spirits can also ascend towards God and this they do through contemplation; God, in turn, can descend down to spirits through revelation.[134] To each of these faculties there is a corresponding instrument: theophany—i.e., God's manifestation—in revelation, intelligence (*intelligentia*) in contempla-

[132]"Multum enim distat inter corpus et spiritum […] Est ergo quiddam quo ascendit corpus ut appropinquet spiritui, et rursum quiddam quo descendit spiritus ut appropinquet corpori," Hugh of St. Victor, *Il "De unione corporis et spiritus" di Ugo di San Vittore*, ed. A.M. Piazzoni, Studi medievali, 3rd ser., 1 (1980):861-868, 883.4–7 (265A). The number in brackets refers to the traditional Migne edition: Hugh of St. Victor, *De unione corporis et spiritus*, ed. J. P. Migne, Patrologia Latina, 175: 285–294 (Paris: Garnier, 1854).

[133]"[…] et spiritus sunt alii superiores, alii inferiores, alii infimi et pene infra spiritualem naturam prolapsi, ut in hunc modum infima cum summis copulentur," Hugh, *De unione*, 883.11–14 (285B).

[134]"Corpus sensu ascendit, spiritus sensualitate descendit. Item spiritus ascendit contemplatione, Deus descendit revelatione," ibid., 883.19–20 (285B).

tion, imagination (*imaginatio*) in sensuality and the instrument of sensuality in sense perception.[135]

Hugh does not really explain what these instruments are except for imagination. But, before doing that, he provides a deeper reason why, at least in the case of material entities, ascent and descent are possible. Indeed, Hugh explains, the different ranks of being are derived from the nature of the four basic elements out of which all material entities are composed. The elements themselves, in fact, can be ordered according to the rank of their properties. The easier an element can be moved and the more difficult it is to contain it, the higher the element ranks in the scale. Thus, earth and water are of a lower rank than air and fire because the former are more easily contained and less easily moved. Even though air is sometimes called spirit, Hugh notes, fire is the element that is closer to spirit. Fire, indeed, Hugh says, is the most movable and the less containable element of the four. As a sort of confirmation to this view, Hugh points out that given that sense perception is what makes bodies ascend toward spirit, the more an element is like spirit, the farther it is from sense perception. So, for example, Hugh says, air has such subtlety that it cannot be seen that easily.[136] This presumably should be still more applicable to fire, even though normally fire is more visible than air.[137] Sense

[135]"Theophania est in revelatione, intelligentia in contemplatione, imaginatio in sensualitate, in sensu instrumentum sensualitatis," Hugh, *De unione*, 883.21–23 (285B).

[136]See ibid., 884.37–53 (286A–C).

[137]Hugh's discussion has some similarities with Augustine's own discussion of the elements in *De Genesi ad litteram* III.4–5. Augustine also claims the elements are somehow implicated in the process of sense-perception. Fire, being the most volatile, is also for him the closest to the spiritual. Just as Hugh, Augustine claims, however, that the realm of the spiritual and the realm of the corporeal are two separate kinds.

perception, the first step towards knowledge, so to speak, is thus a purification of the material, a stripping off of lowly elements. In Hugh's theory it seems that the higher elements somehow serve to convey information about objects of knowledge. That information is decoded in the head.

Knowledge (*scientia*) of things, Hugh says, is a prerogative only of man and not of plants and other animals, and is possible because of the existence in the head of the faculty of creating imaginations (*vis imaginandi*). Imaginations are so elevated that they are the closest things to spiritual nature and above them in the scale of being there cannot be anything but reason.[138] An imagination is indeed a "fiery" nature that is like the translation of what is formed outside the soul and that can be called a sense percept (*sensus*).[139] Hugh explains the process next using sense perception through vision as an example. First, the form of a sensible thing is drawn into the eyes by the vision rays. Recall that for Hugh, as for Augustine, sense perception is active: the eyes emit vision rays which hit the external things; the ray's reflections carry the sensible form back into the eyes. After this, the form, still a corporeal entity, traverses the inner organs of vision, is purified once more and is conveyed to the brain (*cerebrum*), where an imagination is formed. An imagination for Hugh is thus a corporeal thing that has gone through a process of purification so that it can participate in the crucial step that happens next:

[138] "Nichil autem in corpore altius, vel spirituali naturae vicinius esse potest quam id ubi post sensum et supra sensum vis imaginandi concipitur. Quod quidem, in tantum sublime est, ut quidquid supra illud est, aliud non sit quam ratio," Hugh, *De unione*, 885.83–5 (287B).

[139] "Ipsa utique vis ignea, quae extrinsecus formata sensus dicitur, eadem forma usque ad intimum transducta imaginatio vocatur," ibid., 886.85–6 (287B).

> "the imagination travels from the front of the head to the centre where it *touches* the very same rational substance of the soul and excites the capacity to discern, having been purified and made subtle so much already that it is *joined* together immediately with the same spirit." (My emphasis)[140]

At no point in the process there is a direct transformation of a class of entity into another class. The corporeal is still corporeal and the spiritual still spiritual.[141] There is just some sort of interaction between two things that stand at approximately the same level of being even if belonging to different classes, an imagination in the corporeal side and the soul in the spiritual side. Thus, after the interaction between the corporeal and the spiritual takes place, reason takes over and the spiritual thing that established contact with the imagination is purified even more. At some point, presumably, it would reach a level

[140] "Postea eadem imaginatio ab anteriore parte capitis ad mediam transiens, ipsam animae rationalis susbtantiam contingit, et excitat discretionem, in tantum iam purificata et subtilis effecta, ut ipsi spiritui immediate conjugatur," Hugh, *De unione*, 886.91–4 (287B–C).

[141] This passage seems to include also both an appropriation and a response to newly translated medical texts. There were translations of Arab and Greek works already in the mid 11th century in places like Salerno, Italy. According to Liccaro, Hugh in *De Unione* is indeed responding to one of those translations, namely a collection of 10 books on medicine attributed to Isaak Ben Israeli and translated by Constantine the African in Salerno. In book IV of this collection it is said that every spirit is of three kinds of spirit: natural, spiritual and animal spirit. Most of the functions usually attributed to parts or aspects of the soul are explained as the movement of animal spirit, which is identified as moving through the nerves and that seems to belong squarely within the realm of the corporeal, throughout the different parts of the brain: memory in the back, sense and fantasy in the front, and reason and intellect in the middle. Hugh retains this idea of the localization of the activities in the brain. Authors such as William of Conches, Liccaro says, would embrace this kind of theories as well and would try to take them into account in their own views about issues such as the relation between the world-soul and the human soul. Hugh, on the other hand, wants to make it very clear that there is no conversion from the corporeal to the intellectual. See Vincenzo Liccaro, "Ugo di San Vittore di fronte alle novita delle traduzioni delle opere scientifiche greche e arabe," Actas del V congreso internacional de Filosofía Medieval, vol II, 919–926 (1979).

in which it would properly be knowledge.

The process can continue even further up in the scale, for, according to Hugh, the soul can form purer thoughts and can reach a state, presumably of something still like knowledge, that would be closer to God. In principle, it should be noted here, this process does not need to start with thoughts or knowledge coming from the process of perception; it can start with anything that is already in the soul. As mentioned earlier, for Hugh, in this higher state called contemplation, the instrument would be intelligence. Later in the text Hugh succinctly explains this : an intelligence—the purest of thoughts, if we make the analogy to an imagination for the corporeal—is formed in the interior of the soul as the product of reason being concurrent with divine presence. The latter, Hugh says, informs reason to produce intelligence, which he now equates with wisdom (*sapientia*), in the same way that an imagination informs reason to produce *scientia*.[142] Making a parallel with the cognition of corporeal things, the process of acquiring wisdom may depend for Hugh not only on the soul having or producing purified thoughts, something that seems to be a natural ability, but also on God descending down so that the soul grasps Him. Hugh calls God's descent 'revelation,' as we saw above, but he is probably not referring here specifically to the kind of revelation given in the Scriptures. The process, after all, is presented as purely intellectual; nothing is said of getting anything through language.

[142]"Quando autem ab anima sursum itur ad Deum, prima est intelligentia, quae est ratio ab interiori formata, quia rationi concurrens conjungitur praesentia divina, quae sursum informans rationem facit sapientiam, sive intelligentiam, sicut imaginatio deorsum informans rationem, scientiam facit," Hugh, *De unione*, 888.156–159 (289A).

The process with respect to corporeal things, in any case, also explains for Hugh why the contact with the corporeal can result in vice and degeneration of the soul. Certainly, in the same way that we can talk of an ever increasing purification of the bodily material that makes its way up to the point where it gets in contact with reason, Hugh says, we can talk of a descent of reason toward the body. The spirit has indeed its own mutability and it comes near the body by a process of vilification, putting aside its purity as if assuming the rougher properties of the corporeal. If this happens only according to nature, Hugh adds, there is only mutation and not corruption. If, however, it happens viciously and the soul finds a certain sickly delight in the contact with the body, the nature of the soul gets corrupted.[143] The natural process seems to be then the ascent from the corporeal to the spiritual and upwards finally to God. To put it in Augustinian terms, normally only *scientia* takes place, the soul naturally would not dwell in that noxious part of reason that likes the corporeal. It is a degeneration of the soul that causes humans to forfeit looking for higher knowledge and prevents them from arriving ultimately to wisdom.

The process, then, is natural but it can be inferred that for Hugh there is the possibility, more or less common, of humans to want to stay at the level of the sensible. Thus the need for instruction, not perhaps to overcome the resistance to ascent per se, but to expedite the attainment of a certain level, and perhaps to instil a certain taste for the spiritual, so that real advance towards God can come about. In a way, this is similar to the role Augustine

[143]Hugh, *De unione*, 887.137ff (288C–D).

gives to faith: a helper along the path to wisdom. For both this helper is purely intellectual.

Instruction, as said earlier, comes for Hugh in the form of reading, and in a second stage, as meditation. Hugh does not say much about the latter. The only place in which he touches on it is in Book III of the *Didascalicon*, where it is characterized as "sustained thought on the causes, sources, manner and utility of things."[144] Meditation, Hugh claims, starts with reading but it is not subject to its precepts. Rather, it wanders creating larger and larger spaces of knowledge, seeking for wider, deeper and less obscure things, seeking ultimately to contemplate the truth.[145] We can meditate, furthermore, on three kinds of things: on morals, on God's mandates and on God's works.[146] Hugh does not say which one of these three is more important at this stage, but probably the idea is to balance them out, and not to meditate more on one kind to the detriment of the others. A similar call for balance is stressed in other place in the text where he explicitly warns not to pass up on virtue for study, but, conversely, not to pass up on study.[147] The student should seek virtue but should not forget about other aspects of learning. Clearly, in Hugh the door is open to the study of *all* sciences, including the sciences of nature

[144]"Meditatio est cogitatio frequens cum consilio, quaeu causam et originem, modum et utilitatem uniuscuiusque rei prudenter investigat," Hugh, *Didascalicon*, III.10, 59.13–15.

[145]"meditatio principium sumit a lectione, nullis tamen stringitur regulis aut praeceptis lectionis. delectatur enim quodam aperto decurrere spatio, ubi liberam contemplandae veritati aciem affigat, et nunc has, nunc illas rerum causas perstringere, nunc autem profunda quaeque penetrare, nihil anceps, nihil obscurum relinquere." ibid., III.10, 59.16–19.

[146]"unum constat in circumspectione morum, aliud in scrutatione mandatorum, tertium in investigatione divinorum operum." ibid., III.10, 60.3–5.

[147]"illis studium virtutum, istis vero interim exercitium lectionis propositum est, sic tamen ut nec hi virtute careant, nec illi prorsus lectionem omittant." ibid., V.8, 108.15–18.

and mathematics. It seems, furthermore, that it is, in fact, mandatory for the Christian to engage in the study of scientific disciplines without necessarily having to see those as mere preparation for the study of the Scriptures, as it was for Augustine in *De doctrina christiana*. From what we have seen, scientific disciplines in this context should mean simply disciplines that can be read and through which we can reach higher and higher states of spirituality and intelligence, that is, disciplines through which we can arrive at wisdom.

The final goal of both reading and meditation is, in fact, wisdom. Indeed, Hugh starts the first chapter of the *Didascalicon* with an emphatic affirmation: "of all things that ought to be sought, the first is wisdom, in which the form of the perfect good consists."[148] We saw that Hugh equated wisdom with intelligence in *De unione*, and that this was the instrument at the highest level of knowledge possible, the closer to God. Here Hugh expresses again the thought that wisdom is the highest, but now with a clearer moral imperative which is supported by the identification of wisdom with the form of the perfect good. Hugh does not elaborate on this identity most probably because the statement was surely familiar and indeed fairly acceptable to educated Christians of his time. The sentence most certainly implies something further: that wisdom is identical with God Itself, specifically with Christ, the second person of the Trinity. As Taylor points out, this identification could have come to Hugh from Boethius and the commentary tradition.[149] Certainly, in the mid-

[148]"Omnium expetendorum prima est sapientia, in qua perfecti boni forma consistit," Hugh, *Didascalicon*, I.1, 4.4–5.

[149]Hugh, *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*, 175, n1.

dle sections of the *Consolation* Boethius reaches what is probably the most important conclusion of the work, that real happiness is striving for the Good, and the form of the Good is, in fact, the substance of God.[150] The *Consolation* was widely read and commented throughout the Middle Ages, and most of the commentaries came in the form of marginal notes passed on from manuscript to manuscript. Although it is hard to tell who wrote which marginal note, the ninth century thinker Remigius of Auxerre is known for having composed many of them and one in particular related to this section of the work. In Remigius's view, what Boethius calls 'form' here is in fact the son of God, who, following a traditional interpretation of a text by the apostle Paul, is the wisdom of God.[151] Hugh, then, subscribes to a same view very similar to that of Augustine regarding wisdom, although expressed and justified in different ways.

In the rest of the first chapter of the *Didascalicon*, Hugh expresses another position similar to that of Augustine but again in somewhat different terms. According to Hugh, in reality all that man needs to know he can get from knowledge of his own soul. Wisdom, Hugh claims, illuminates man so that he should know himself and tells him how unbecoming it is for him to look

[150]Boethius, *Consolatio*, III.10.

[151]"Formam uocat filium dei qui est sapientia dei, per quem omnia facta sunt," H.F. Stewart, "A Commentary by Remigius Autissiodorensis on the De Consolatione Philosophiae of Boethius," *Journal of Theological Studies* 17 (1916): 31. The identification, in general, of the form of God with Christ comes from Paul's epistle to the Philippians 2:6, which in the Vulgate reads "qui cum in forma Dei esset non rapinam arbitratus est esse se aequalem Deo" ("Who, being in the form of God, thought it not robbery to be equal with God"). The source for Christ as the wisdom of God is probably 1 Corinthians.

outside.[152] This is not precisely Augustine's theory of illumination, which, to recall, is the theory that the mind is capable of "seeing" eternal forms because those are illuminated in a way similar to how material things are illuminated by natural light.[153] The illumination Hugh is talking about is just the simple realization that what man needs to seek and know is already inside the soul. The key for Hugh is that the soul, in fact, carries the likeness of all things, and in a way can be said to be made of everything.[154] This is not say that the soul has the composition of all things but rather that it has the reason (*ratio*) of that composition. The likeness of things that is in the soul, Hugh adds, is not something given to the soul from outside but rather something that it has of its own power. The soul, he says, is not like a wall to which the likeness of things is painted on the outside but like a piece of metal to which an image is engraved.[155] The metal indeed assumes the image of the impression and starts to represent the thing impressed to it, like say, the image in a coin, by its own power and ability. That is, the metal does not need anything external to it—like, for example, the paint is needed in a wall—to represent whatever is imprinted on it. The soul, Hugh says, has

[152]Hugh, *Didascalicon*, I.1, 4.5–9.

[153]In a passage in *De unione* Hugh uses the analogy of the light while talking about knowledge of corporeal things. Rational substance is corporeal light to the imagination, which is, in a way, a shadow. The analogy, however, is not exploited any further. See Hugh, *De unione*, 887.119–24 (288B).

[154]"probata apud philosophos sententia animam ex cunctis naturae partibus asserit esse compactam," Hugh, *Didascalicon*, I.1, 4.13–14.

[155]"videmus cum paries extrinsecus adveniente forma imaginis cuiuslibet similitudinem accipit. cum vero impressor metallo figuram imprimit, ipsum quidem non extrinsecus, sed ex propria virtute et naturali habilitate aliud iam aliquid representare incipit." ibid., I.1, 5.23–26.

the similitude of every other thing but virtually and potentially.[156] This can also be understood if we consider again Hugh's description of the process of knowledge. In the case of the perception of external, corporeal things, there is indeed an interaction between the "purified" corporeal forms of things and the soul; however, at all times higher knowledge occurs exclusively in the realm of the spiritual or rational. Since higher and higher knowledge entails further purification from whatever is left of that interaction with the corporeal, in principle, by its own activity, the soul could attain knowledge without needing any corporeal element whatsoever. The "input" to the purification process could be, for example, the activity of the soul itself, although Hugh does not explain this. What is certain is that there is no explicit requirement in Hugh for knowledge, let alone contemplation and wisdom, to be based on the sensible.

But, Hugh warns, man is made asleep by the corporeal passions and, carried away out of himself by sensible forms, forgets what he is.[157] This is, again, why doctrine and learning are important. Ultimately, "we are recovered by doctrine, so that we may recognize our nature and so that we may learn not to seek outside what we can find in ourselves."[158] Learning—i.e., the acquisition of *scientia*—is thus a crucial element of help in the quest for man's goal in life. It is not strictly speaking necessary, but in practice it probably is. *Scientia* has for Hugh therefore mainly a curative role.

Reading, the first stage of learning, is thus what interests Hugh in the

[156]"virtualiter atque potentialiter," Hugh, *Didascalicon*, I.1, 6.2.
[157]Ibid., I.1, 6.3–7.
[158]"reparamur autem per doctrinam, ut nostram agnoscamus naturam, et ut discamus extra non quaerere quod in nobis possumus invenire," ibid., I.1, 6.7–9.

Didascalicon. In the preface he announces that there are two main types of writings, secular and sacred, and so he divides the book in two parts of about the same length to treat each type separately. He also affirms that philosophy encompasses in fact all the arts and disciplines, and thus, in order to know what to read it is necessary to provide a description of philosophy, in particular, it is necessary to "divide philosophy from the highest to the most remote" of disciplines.[159] Unlike Augustine's division of the science in *De doctrina*, however, Hugh's division of the sciences is essentially Aristotelian. It is, in fact, for the most part a direct quotation from Boethius' commentary to Porphyry, which we saw in the previous chapter of this dissertation. Boethius, and thus Hugh, divides the sciences into the practical and the theoretical, and the latter into physical, mathematical and divine. Boethius and Hugh add logic as a major subdivision next to the practical and theoretical, making it thus an integral part of philosophy. Hugh's most important departure from Boethius and Aristotle is the addition of a fourth major subdivision, the mechanical sciences, which he says consist of seven major arts: fabric making, armament, commerce, agriculture, medicine and theatrics.[160] More than a century later, Kilwardby would include these disciplines in his own classification of the sci-

[159]"ut autem sciri possit quid legendum sit aut quid praecipue legendum sit, in prima parte primum numerat originem omnium artium deinde descriptionem et partitionem earum, id est, quomodo unaquaeque contineat aliam, vel contineatur ab alia, secans philosophiam a summo usque ad ultima membra," Hugh, *Didascalicon*, preface, 2.24–25.

[160]The inclusion of medicine is particularly interesting because medicine was indeed a discipline with a long and extensive tradition but that was not considered part of the liberal arts since the times of the Roman scholar Varro (116–27 BCE). Varro includes medicine and architecture as a third group of disciplines besides the two groups that will be eventually called trivium and quadrivium. Varro's scheme is explained in Pedersen, *The First Universities*, 23.

ences and would refer back to Hugh to explain them.[161]

This move is argued for by Hugh all along the first book of the *Didascalicon*, using a careful selection and rearrangement of materials again mainly from Boethius. After establishing the moral and intellectual priority of wisdom, as we saw above, he explains in chapter 3, quoting from Boethius, that the human soul has three different kinds of power. The first, lowest level power tends to the body and is responsible for ensuring its nourishment and growth in order to guarantee its existence. The second power, which all animals have, is sense perception, which enables them to grasp the sensible forms of things. The third and highest power, the prerogative of man, is reason, which uses the other two powers as its servants, so to speak, and permits knowledge and the enquiry into the nature and causes of things.[162] The quotation is from Boethius's Major Commentary on Porphyry's *Isagoge*, I.01.04–I.02.01, but Hugh takes this passage out of its original context. Boethius uses it to introduce logic; Hugh uses it to justify the idea, which he spells out in chapter 4, that since philosophy is the pursuit of wisdom, and wisdom must deal with *all* human actions, philosophy necessarily has to deal with all three aspects of the soul. The mind, Hugh continues still quoting Boethius, strives for two things: the nature of things and the knowledge of those things which morality will turn into action.[163] This seems to be sufficient for Hugh as an explanation

[161]See Robert Kilwardby, *De ortu scientiarum* (Toronto: The Pontifical Institute of Mediaeval Studies, 1976), ch. 38–40 (128–133).

[162]Hugh, *Didascalicon*, I.3, 7–10.

[163]"unum quidem ut rerum naturas inquisitionis ratione cognoscat, alterum vero, ut ad scientiam prius veniat, quod post gravitas moralis exerceat,", ibid., I.4, 10.18–21.

of the origin of the practical and theoretical arts; he will not elaborate on exactly how the theoretical and the practical originate. He continues rather by saying that, in particular, philosophy consists of "not only such studies as are concerned with the nature of things but also [of] those concerned with the reasons or theories (*rationes*) of all human acts and pursuits."[164] Hugh is quick to point out that this does not contradict something he had said earlier about wisdom not being about things like farming and building; in fact, the kinds of things he is talking about here as belonging to philosophy have to do with theory behind those activities, not with the practical deployment.[165] Those theoretical sciences that tend to the lowest level of the soul constitute precisely what Hugh will call mechanical *scientia* a few chapters later.[166] *Scientia* is thus purely theoretical; indeed, only in this way given Hugh's account of knowledge, could it lead the soul away from the material onto higher levels of being.

Two other subdivisions of philosophy, however, the practical and the theoretical, tend exclusively to the other two levels of the soul and together, Hugh says, they constitute intelligence (*intelligentia*). We just saw that this is Hugh's term for what is involved when the human soul is getting closer to the divine. According to Hugh in the *Didascalicon*, indeed, these two parts of philosophy are, in fact, responsible to bring man closer to God and, in a way, to restore man's divinity.[167] The concept of restoration (*restauratio*) is certainly one of

[164]"non solum ea studia in quibus vel de rerum natura vel disciplina agitur morum, verum etiam omnium humanorum actuum seu studiorum rationes," Hugh, *Didascalicon*, I.4, 11.9–12.
[165]Ibid., I.4,11.20–25.
[166]Ibid., I.8, 16.3–4.
[167]Ibid., I.7–8, 14–16.

the major themes in Hugh's theology, as is clear from even a cursory reading of his massive theological treatise *De sacramentis christianae fidei*. According to Hugh, the subject matter of the Scriptures is none other than the work of man's restoration after God's work of creation during the first six days of the world.[168] After providing a narration of how the world and man were created, Hugh says later, the Bible tells us how man was arranged to be in the way of justice and discipline, then let go and finally restored. Thus, "first [the Scriptures] describe the matter in which [man] was made and arranged, then [his] misery in fault and punishment, and then [his] restoration and mercy in the cognition of truth and the love of virtue."[169] The Scriptures therefore point to exactly the same place as *scientia*, namely to the improvement of man along a path that goes up to God.[170] The process of acquiring knowledge of things as in the pursuit of *scientia*, is thus essential to the life of the Christian.

The role of *sacra pagina* studies—not yet of theology, for Hugh does not calls it that way like Abelard does—seems to be, in a way, discovering or uncovering the nature of this path towards *sapientia* from within the symbolic world of the Scriptures. Hugh's conception of the integration of pagan and

[168]Hugh of St. Victor, *De sacramentis christianae fidei*, ed. J. P. Migne, Patrologia Latina, 176: 173–618 (Paris: Garnier, 1854), 183A–B.

[169]"Primum ergo describit materiam in eo quod factus est et dispositus; deinde miseriam in culpa et poena; deinde reparationem et misericordian in cognitione veritatis et amore virtutis," ibid., 184C.

[170]In a very recent book, Coolman defends an even stronger conception of Hugh's theology in which the key concept is not restoration but "re-formation." Hugh's theology affirms, Coolman argues, that man not only gets restored but actually get to adopt the form of the divinity that he had lost at the Fall. This interpretation seems to be very plausible, given Hugh's talk about the soul getting imprinted with the forms of external things in the prologue to the *Didascalicon*. Getting closer to God would then naturally be a process also of adopting a form in this way. See Coolman, *The Theology of Hugh of St. Victor*.

Christian studies is thus much deeper than, for example, Abelard's. It is not simply a matter of pagan philosophers having lived virtuous lives and having foreshadowed some of the Christian mysteries, as Abelard would have it.[171] It is rather that some of those philosophers were in fact working towards exactly the same goal. This does not mean, nonetheless, that *everything* the philosophers wrote is true. The Scriptures are still for Hugh the only place where we can have the certainty of reading only true things. Later on in the *Didascalicon*, at the beginning of the part dedicated to the Scriptures, Hugh compares the writings of the philosophers to a whitewashed wall of clay shining with eloquence but that upon closer inspection may turn out to have just a coat of paint that easily reveals the darker colour of error. The Scriptures, on the other hand, are like a honeycomb: the simplicity of their language makes them seem dry, but they are rather filled with sweetness. They are indeed, "so free from the infection of falsehood that they are proved to contain nothing contrary to the truth."[172] It seems therefore that rather than the *writings* of the philosophers, the Christian should look for the truth as captured in the scientific disciplines, that is, in the disciplines that express *scientia*. Thus the need also to provide an extensive list of reputable authors and writings to read, which is what Hugh does extensively in the *Didascalicon*.

Back to the division of the sciences in the *Didascalicon*, Hugh continues by drawing into his idea of a two-fold way of attaining God. In *De sacramentis* he

[171] See page 83 above.

[172] "[…] quae sola sic a falsitatis contagione inveniuntur, ut nihil veritati contrarium continere probentur" Hugh, *Didascalicon*, IV.1, 70.19–21. The paraphrased text is just before this quotation at 70.13–19.

talks explicitly of restoration; here he talks mainly of being like God. In both conceptions the Christian advances by being virtuous and by contemplating the truth. The part of philosophy that is concerned with virtue is practical philosophy; the one concerned with the truth is theoretical or speculative philosophy.[173] At this point in the text Hugh introduces a distinction between *scientia*, which refers to the mechanical, and intelligence, which refers to the practical and theoretical. This is an odd formulation: *scientia* would be at a lower level. Hugh, however, does not seem to use this notion in this particular connotation anywhere else in the *Didascalicon*. In the rest of the book, *scientia*, in general, includes both this theoretical knowledge of things that tend to the body, and knowledge of the practical and the purely theoretical. The part that tends to the body, the mechanical, Hugh also calls human, while the other two are divine.

The last subdivision of philosophy is logic. Hugh explains its origin by continuing the quote of Boethius that he had interrupted to introduce the other three subdivisions. Logic is indeed about the nature of correct and true discourse. A big mistake of some Ancients like Epicurus was transferring to the real world what they found by dubious reasoning; hence the need to know what form of reasoning is dependable and what must be held suspect. The ancients, seeing their error, concluded that the nature of the argument had to be considered first, thus the skill in the discipline of logic began. Logic came last in time, concludes Hugh still quoting from Boethius, but is the first

[173]Hugh, *Didascalicon*, I.8, 16.3–4.

that should be read, for without it no treatise of philosophy can be explained rationally.[174] Hugh then adds some precisions: the word 'logic' comes from 'logos', which can mean word or reason, so logic can be called either linguistic (*sermocinalis*) or rational science (*scientia*).[175] Linguistic logic, moreover, is the genus of grammar, dialectic and rhetoric (i.e., the disciplines of the trivium); rational logic is included in it, and is comprised of dialectic and rhetoric.

Hugh thus subdivides philosophy in four: theoretical, practical, mechanical and logical. The rest of the hierarchy, except for the mechanical sciences, follows the Aristotelian order and for the most part Hugh simply quotes from other sources. The theoretical is divided into physics, mathematics and theology; the practical into solitary, private or familiar, and public. To be noted here, however, is Hugh's use of Boethius's terms intellectible and intelligible. If we recall from Chapter 1, Boethius had said in his commentary to Porphyry that the theoretical sciences are divided in three parts that deal the intellectible, the intelligible and the corporeal. 'Intellectible' is a word he confesses to have invented himself to translate the Greek νοητόν.[176] Hugh quotes Boethius's explanation of the first two parts, the intellectible and the intelligible, in two different chapters when discussing theology and mathematics.[177] Boethius himself says explicitly that the sciences of the intellectible are exactly what the Greeks call theology, the intellectible being characterized as divine,

[174]Hugh, *Didascalicon*, I.11, 19–20.
[175]Ibid., I.11, 21.3–5.
[176]Boethius, *Anicii Manlii Severini Boethii In Isagogen Porphyrii commenta*, I.03.8. See page 68.
[177]Hugh, *Didascalicon*, II.2, 25.10–14 and II.3, 26.8–20.

eternal things that endure by themselves and that can only be apprehended by the intellect and never by the senses. Boethius does not actually say that the second part, the one that deals with the intelligible corresponds exactly to mathematics as Hugh does. The intelligible, according to Boethius, comprehends the intellectible by means of thought and intelligence; it is presented, in fact, as a degeneration of the intellectible. Hugh elaborates on this and explains that the nature of the souls and spirits, being incorporeal and simple, participates in the intellectible. Yet, at the same time, with their sense organs they descend to the apprehension of physical things and thus participate in the intelligible: they stop being simple and, by ressemblance with the composite, admit a type of composition themselves.[178] It is not clear how this actually relates to mathematics, but in the next few chapters there is a hint, even if slight, a what Hugh may be thinking about. What follows in the text is actually two chapters explaining how numerical progressions, and the number 4 in particular, are related to progressions of the soul and the body. At the end of chapter 5, Hugh affirms that this is also how intellectible things degenerate into intelligible things, namely by descending from the purity of the simple understanding (*intelligentia*) to the imagination (*imaginatio*) of visible objects.[179] This, of course, connects Hugh's talk of intellectible and intelligible directly

[178]"Spirituum namque et animarum natura, quia incorporea et simplex est, intellectibilis substantiae particeps est. sed quia per instrumenta sensuum [753C] non uniformiter ad sensibilia comprehendenda descendit, eorumque similitudinem per imaginationem ad se trahit, in eo quodammodo suam simplicitatem deserit, quo compositionis rationem amittit. neque enim omnimodo simplex dici potest, quod composito simile est," Hugh, *Didascalicon*, II.3, 26.21–27.1.

[179]ibid., II.5, 29.15–6.

into his theory of knowledge. Indeed, "so that I may speak more clearly," Hugh add, "the intellectible in us is that which is intelligence (*intelligentia*), whereas the intelligible is that which is imagination."[180] We will have to wait 12 more chapters until we finally get the connection to mathematics. Those 12 chapters are in fact an explanation of the disciplines of the quadrivium plus a chapter on physics. In chapter 17, finally, when explaining what is proper to each of the arts, Hugh contrasts logic with mathematics: logic treats of intellectual things in the predicamental framework, while mathematics treats them in their numerical composition; logic sometimes uses pure intelligence, where mathematics never works without the imagination and so never possesses its object in a simple, non-composite way.[181] So, the intellectible is simple and is associated with intelligence. The intelligible, on the other hand, is mixed with the corporeal and thus with the composite and the imagination. Mathematics, in turn, can never escape imagination and the imprint of the incorporeal and thus is in the realm of the intelligible.

Before finishing this account of Hugh's views on the sciences, a word should be said about the liberal arts. As we have seen, the general scheme of the sciences is not based on them. Mathematics is integrated into the picture as one of the Aristotelian subdivisions, and Hugh describes them in book II, as we just saw, specifically in chapter 6 to 16. The disciplines of the trivium are

[180] "Est igitur, ut apertius dicam, intellectibile in nobis id quod es intelligentia, intelligibile vero id quod est imaginatio," Hugh, *Didascalicon*, II.5, 29.19–21.

[181] "logica tractat de ipsis intellectibus secundum praedicamentalem constitutionem; mathematica vero, secundum integralem compositionem, et ideo logica quandoque utitur pura intelligentia, mathematica autem nunquam sine imaginatione est, ideoque nihil vere simplex habet," ibid., II.17, 36.15–19.

described as part of logic at the end of that same book II, chapters 28 to 30. In book III, however, in which Hugh gives precise indications about the works that need to be studied and how they have to be studied—including a description of the higher skill of meditation that we discussed earlier—he comes back to them. He basically praises the liberal arts as being the disciplines that the ancients have selected as special and worthy of mastering. Indeed, in his view the liberal arts is where the foundation of learning is to be found; they should be mastered because without them no philosophical discipline would be capable of explaining or defining anything.[182] Hugh here is certainly not negating what he has said about the origin of the different scientific disciplines. The point seems to be, rather, that when it comes to learning, these disciplines should take precedence. They are, obviously, scientific disciplines in themselves, but also like "the best instruments [and] the best rudiments by which the way is prepared for the mind's complete knowlege of philosophic truth.[183] With these remarks, which should be understood within the context of practical advice for students, and not as theorizing about the hierarchy of the disciplines, Hugh manages to include into his account also the traditional educational view of the preeminence of the liberal arts in the curriculum.

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To sum up, Hugh gives us a fairly complete and sophisticated account of

[182] "verumtamen in septem liberalibus artibus fundamentum est omnis doctrinae, quae prae ceteris omnibus ad manum habendae sunt, utpote sine quibus nihil solet aut potest disciplina philosophica explicare et definire," Hugh, *Didascalicon*, III.4, 55.14–18.

[183] "sunt enim quasi optima quaedam instrumenta et rudimenta quibus via paratur animo ad plenam philosophicae veritatis notitiam," ibid., III.3, 53.5–8.

scientia. Human knowledge and philosophy are part of an integrated theory together with what Hugh takes to be the correct interpretation of the Scriptures. His hierarchy of the different disciplines is Aristotelian but he adds also the mechanical sciences to the picture. His conception of *scientia* is, in general, similar to Augustine's: it is that knowledge that helps man ascend towards *sapientia*, the contemplation of God. Hugh, however, ties this into the very fabric of man's knowledge acquisition process in the soul, with the different theoretical disciplines stemming from the different parts of the soul and the needs of man. Unlike for Augustine, for whom the mathematical sciences and in particular the understanding of number is what brings man closer to pure spirituality, Hugh's disciplines are part of a more comprehensive system, with the theoretical disciplines and Aristotelian theology coming on top. For both Hugh and Augustine, on the other hand, the study of Scriptures is important for knowledge because they contain revealed truths and nothing but truths.

No other writer before the influx from the newly translated scientific writings of Aristotle besides Hugh takes on the problem of *scientia* head on.[184] We

[184]A quick note is in order regarding the so-called School of Chartres, which is generally depicted in the secondary literature as actively engaging with natural science. Besides the fact that is it highly unlikely that there was ever a movement of thinkers effectively associated with a school in Chartres, and while it is true that people like William of Conches, Thierry of Chartres and Gilbert of Poitiers did write on many issues of cosmology and natural philosophy and generated very interesting ideas on these matters, their thoughts about *scientia* itself are minimal. Thierry and Gilbert wrote commentaries on Boethius's *De trinitate*, for example, and glossed Aristotle's tripartite division of the sciences. However interesting that may be—Fidora addresses some issues in Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 48ff—they do not seem enough to draw an account of *scientia* out of them. Note, however, that Thierry repeats the idea of the priority of wisdom in the preface to his *Heptateuchon*, a collection of newly translated textbooks for the liberal arts that includes, most notably, Euclid's *Elements*; see Edouard Jeauneau, "Le Prologus in Eptateuchon de Thierry de Chartres," *Medieval Studies* 16 (1954): 171–175. For a thorough discussion of the remote possibility of there being a real School of Chartres, see Southern, *Scholastic Humanism and the Unification of Europe, Volume I*, 61–101. For an excellent introduction to many

cannot say, therefore, at this point in our investigation that his conception of *scientia* is *the* conception of *scientia* in the twelfth century before the bulk of Greek and Arab sources come into the picture. We can say, however, that this conception, being fairly similar to one we can read in Augustine and using numerous elements from Boethius, is much in line with the early medieval tradition we studied in chapter 1 and that was widespread in the twelfth century. It would be rather strange to find a much different conception. Hugh also addresses the main challenge raised by contrarians to dialectics and pagan sources by providing a picture of the nature of man and the divinity that requires the development of human knowledge (*scientia*) in order to attain the Christian goal of contemplation of God. We should expect then, something like Hugh's conception to prevail and guide later authors in their first readings of the scientific works of Aristotle and the Arabs. This is precisely what happened, as we are about to learn in the next chapter.

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of the issues in the three figures just mentioned see the individual articles on each one by Dorothy Elford, John Marenbon and Peter Dronke in Dronke, *A History of Twelfth-Century Western Philosophy*, 308ff. For a book-length study of cosmological issues in these figures see Ellard, *The Sacred Cosmos*. Ellard believes in a real Chartrian connection between the authors.

Chapter 3

Gundissalinus

The traditional disciplines of the liberal arts, especially those of the trivium—and most notably dialectics—were, by the mid twelfth century, deeply ingrained in the educational system of the Latin West and, in the case of dialectics, also on their way to becoming an integral part of the way thinkers dealt with a variety of doctrinal issues. Basically no one from this era—Abelard being the glaring exception—refers to this way of dealing with the Scriptures and the writings of the Church Fathers as theology; that term would have to wait until the thirteenth century to establish itself. The Scriptures were seen, for sure, as a source of knowledge altogether separate from the pagan disciplines, however, for thinkers like Hugh, they were also seen as one of the two sides of knowledge as a whole. As we have just seen in the previous chapter, Hugh had a fairly sophisticated account of how all that plays out, with a clear conception of *scientia* as one of the higher levels of knowledge, and as essential in the pursuit of wisdom, that being the ultimate goal for the Christian.

Once the translation movement that brought the full Aristotelian corpus to the Latin West got under way, thinkers were exposed to a different outlook on knowledge and, since we know that eventually *scientia* came to mean Aristotle's ἐπιστήμη, we can talk of a transition. In this chapter, I look at the beginning of this transition, many decades before Aristotle's *Posterior Analytics* was commented on directly.[185] The most important work of such transitional writings is Gundissalinus's *De divisione philosophia*, which we can consider, in retrospective, as an Aristotelian update to Hugh's *Didascalicon*.[186] As we will see in this chapter, in spite of the new Aristotelian elements—most not taken from Aristotle's texts directly, but rather from Arabic philosophers—Gundissalinus, in general, still works in an intellectual environment similar to the one described in the previous chapter. His collation of sources tells us that certainly the translation movement at this point in time did not represent a complete break with the past, and that the transition, at least in the twelfth century, was not an abrupt one.

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It should not be surprising that one of the first treatises that heavily incorporates Arabic and Greek sources comes from Toledo, the place where most of the first translations originated. Dominicus Gundissalinus or Gundisalvi

[185]This ocurred only until the thirteenth century. The first commentary is by Grosseteste in the 1220s. See Robert Grosseteste, *Commentarius in Posteriorum analyticorum libros*, ed. Pietro Rossi (Firenze: L.S. Olschki, 1981).

[186]The two works are from about the same time but there is no evidence of neither of the authors reading each other's work. For sure, Hugh does not include in his work any element that might make us think he read or studied any of the sources available to Gundissalinus. Gundissalinus, on its part, does not quote or alludes to Hugh in any noticeable way.

(c.1110–1190), officially the archdeacon of Cuéllar, is himself credited with many translations of Arabic works.[187] He is also the author of five independent works: two on the soul (*Tractatus de anima* and *De immortalitate animae*), a short treatise on unity (*De unitate*), a metaphysical account of creation based on biblical sources (*De processione mundi*), and his most influential work, *De divisione philosophiae*.[188]

De divisione, which was written in the 1140s, is similar to Hugh's *Didascalicon*, not only in its subject matter, but also generally in the manner in which its author makes use of the materials available to him. Both treatises are, for the most part, extended, carefully selected quotations from a variety of sources, joined together and given coherence by original text from the author. At first glance, indeed, *De divisione* appears to be nothing but a rehash of texts by al-Fārābī, Avicenna and some other figures. Upon more careful reading, however, it is obvious that the material has not been simply copied, but that the author has selected texts according to his own original idea of how the subject matter needs to be arranged and presented. We can thus speculate that Gundissalinus was not satisfied with the account and division of the sciences given by, for example, al-Fārābī, whose work would be the closest Arabic model, or, by Hugh, although we do not know if Gundissalinus read the *Didascalicon*. In any case, it is clear that he wanted to provide his own account. The

[187]For a comprehensive list of works and their medieval translations see Bernard G. Dod et al., "Medieval Translations," in *The Cambridge History of Medieval Philosophy*, ed. Robert Pasnau, 2 vols. (Cambridge: Cambridge UP, 2010), 793–832.

[188]For a relatively brief yet comprehensive account of Gundissalinus's life and works see Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 12–19.

main difference between the works of Gundissalinus and al-Fārābī lies in the fact that Gundissalinus, unlike al-Fārābī, did, in fact, provide an explicit and thorough, although sometimes not very clear, account of philosophy and its subdivisions, in an extended prologue. It is in the prologue where we see most clearly that Gundissalinus, in spite of having translated and studied the "new" works of the Greeks and the Arabs, still belongs to an intellectual environment similar to that of Hugh of St. Victor.

Before moving on to Gundissalinus's work, it is useful to have a quick look at al-Fārābī's, so that the differences between the two become clear. The text in question is the *Book of the Enumeration of the Sciences* (*Kitāb iḥṣāʾ al-ʿulūm*),[189] in which al-Fārābī provides his own classification of the sciences known in his time and cultural environment. This cultural environment was the Arabic writing (al-Fārābī himself was not a native Arabic speaker), Abbasid, intellectual society at the turn of the tenth century in what is called by Gutas "the second beginning" of philosophy in Baghdad.[190] The work was translated at least twice into Latin in Toledo. One translation was done probably by Gundissalinus himself or perhaps John of Seville.[191]

[189]Arabic versions with translations into French and Spanish can be found in al Fārābī, *Iḥṣāʾ el-ʿulūm*, trans. Ilham Mansour (Raʾs Bayrut, Lebanon: Markaz al-Inmāʾ al-Qawmīk, 1991) and al Fārābī, *Catálogo de las ciencias*, trans. Ángel González-Palencia (Madrid: Maestre, 1953).

[190]The "first beginning" happened a century earlier and has al-Kindi as its main figure. See Dimitri Gutas, "Origins in Baghdad," in Pasnau, *The Cambridge History of Medieval Philosophy* 24–5. For a general introduction to al-Fārābī, see Majid Fakhry, *Al-Fārābī, Founder of Islamic Neoplatonism: His Life, Works and Influence* (Oxford: One World, 2002).

[191]John of Seville is also known as Johannes Hispalensis. His version does not translate all the Arabic text. González, whose edition includes both Latin versions, ascribes this first translation to either Gundissalinus or John of Seville based only on the fact that Gundissalinus's own *De divisione philosophiae* includes extended literal quotation from it. See Ángel González-Palencia, "Prólogo," in *Catálogo de las ciencias*, by al Fārābī (Madrid: Maestre,

The book is composed of a short preface or introduction, and five larger sections or chapters, each one of which deals with a major subdivision of disciplines and sub-disciplines. The first chapter concerns the science of language (*ʿilm al-lisān*)—essentially grammar, but also including other linguistic knowledge such as prosody and correction in reading (a non-trivial matter in Arabic) and writing—while the second chapter is about logic (*ʿilm al-manṭiq*). Both disciplines are presented as being instruments to the rest of the sciences. The next two chapters correspond, more or less to the three major branches in the Aristotelian subdivision of the sciences. The third chapter is about mathematics (*ʿilm al-taʿlīm*), which includes not only the disciplines of the quadrivium, but also others such as optics, the science of weights and mechanics. The fourth chapter deals with the two other Aristotelian branches: physics (*ʿilm al-ṭabīʿī*) and metaphysics (*ʿilm al-ilāhī*), both essentially understood in the Aristotelian sense. The fifth, and final chapter, is about politics (*ʿilm al-miḥnī*), law (*ʿilm al-fiqh*), and Islamic theology (*ʿilm al-kalām*). Gundissalinus completely omits this entire final chapter from his treatise.

Al-Fārābī does not explain why he chose to present the sciences in this order, and with these subdivisions. The treatise might have been intended as the description of a curriculum for students, not as a philosophical defense or explanation of Aristotle's division of the sciences, nor, indeed, of the author's

1953), xi–xii. The second translation is by Gerard of Cremona and is very literal and complete. Gerard of Cremona is also an important translator of Aristotle's works from Arabic sources; he lived in Toledo, where he died in 1187. See Bernard G. Dod, "Aristoteles Latinus," in *The Cambridge History of Later Medieval Philosophy*, ed. Norman Kretzmann, Anthony Kenny, and Jan Pinborg (Cambridge: Cambridge UP, 1982), 58.

modifications to it. One would expect the prologue to say something about this, but it does not. The short prologue, in fact, simply states the alleged purpose of the treatise, namely, to let the person who wants to learn and observe (*naẓara*/*speculor*) the sciences know where he is going, what kinds of things he is going to be looking at, and what will be the profit and excellence of the enterprise. The student can then compare the different sciences, and determine which one is more excellent, which more useful, which more solid and true, and which more weak and problematic. Also, al-Fārābī continues, the book serves to distinguish the pretenders from both those who are studious, as well as those who are truly wise. The pretenders cannot answer questions about the parts and contents of a science, while other who may be studious, although knowledgeable in one part or area, may not know the rest.[192] The idea is thus, in essence, to map out the different sciences within the presumably well known and accepted Aristotelian division, which now includes other sciences developed in the Medieval Islamic world. Gundissalinus has a different goal for his *De divisione*, so he does not use anything at all from al-Fārābī's prologue, and instead provides his own.

Gundissalinus begins his prologue by asserting the motivation for the treatise. This motivation is altogether different from al-Fārābī's, for in Gundissalinus's work there is an overarching goal: essentially, it has to do, in fact, with wisdom (*sapientia*). Gundissalinus begins by stating that, in ancient times, many wise men illuminated the darkness of the world in the same way stars

[192]Fārābī, *Iḥṣāʾ el-ʿulūm*, prologue, ar:7, fr:43–45.

do. Those men left us the sciences, which, like little torches, illuminate the ignorance of our minds. Because people now are more preoccupied with worldly things, some people put their efforts in eloquence, while others are inflamed by temporal vanity. Gundissalinus laments that the study of wisdom is waning, as people now, like blind men, do not pay attention (*attendunt*) to the light. Thus the need for establishing what wisdom is and what are its parts, even if only expressing it superficially and showing it to people as a sort of degustation of the different parts. The hope is, Gundissalinus says, that people will get a taste of supreme wisdom and, seduced by the flavour of its parts, demand the whole thing for themselves.[193] The idea is thus to entice men to attend to the light of wisdom, with wisdom clearly identified as being opposed to the mundane. This is, of course, in the same line as Augustine's views. The idea of the sciences illuminating men, and making them turn their attention away from the material on to wisdom, is a powerful rhetorical device for readers accustomed to Augustinian fare. Gundissalinus transports the whole enterprise of the sciences so that it comes to reside under the umbrella of wisdom. This is not to say that Gundissalinus is Augustinian as in someone who overall follows

[193]"Felix prior etas, que tot sapientes protulit, quibus uelut stellis mundi tenebras irradiauit. quot enim ipsi sciencias ediderunt, quasi tot faculas nobis ad illuminandam nostre mentis ignoranciam reliquerunt. set quia nunc terrenis curis inseruint, alii circa eloquencie studium occupantur, alii temporalis dignitatis ambicione inardescunt. ideo pene omnes circa sapiencie studium languescunt et presens lumen quasi ceci non attendunt. unde propter istos opere precium duximus, quid sit sapiencia et quas partes habeat, breuiter ostendere et quid utilitatis et iocunditatis unaqueque contineat quasi degustandum eis proponere, ut saltem in summa sapienciam degustent, quam mundana uanitate ebrii miserabiliter abhorrent, et sapore partis allecti totam sibi uendicare satagant, cuius dulcedinem magnam esse ex gustu partis approbant," Gundissalinus, *De divisione*, 1.4–17. In the Latin edition, Baur points out that the first sentence is similar to the first verse in Boethius' *Consolatio* 2.5; however, Boethius's poem is about something completely different.

Augustine's views—he is not. The point is simply that he is still well within the intellectual environment we have been discussing in this dissertation.

The prologue continues with an account of the types of things to which man is attracted. This, just as we saw with Hugh, defines the main subdivisions of the sciences. Man is indeed primordially divided into flesh (*caro*) and spirit (*spiritus*). It is clear that man is attracted to some things on account of the flesh. Some of those things are attractive because they are necessary, others because they give pleasure, and others because of man's curiosity. Of these carnal things, Gundissalinus seems to hold the view that only those things which are strictly necessary for the body are good. In any case, theses types of matters will not be referred to again in the treatise. Indeed, for Gundissalinus, philosophy and the sciences have to do only with the spiritual part of man, which, of course, is also Hugh's view. Man's spirit, Gundissalinus continues, is attracted to three types of things as well. Of these some are nocive, some are vain—magic and secular honours, for instance—and some are useful.[194] The latter are divided into virtues and "noble science" (*scientia honesta*), and in fact, Gundissalinus affirms, "the whole perfection of the human being consists of these two."[195] Gundissalinus does not explain what he means by *scientia honesta*. He seems to imply that there is some other kind of science with negative connotations but there is no mention of this at all in the text.

[194]Hugh of St. Victor also talked briefly about magic in Hugh, *Didascalicon*, III.2, 49–52, distinguishing it from astronomy, and providing arguments to show that it was, indeed, a vain discipline. Although Gundissalinus does not say anything substantial about the issue, he agrees with Hugh on its "moral" status. Hugh's remarks made it into Kilwardby's *De ortu scientarum* more than a century later. See Kilwardby, *De ortu*, ch. 67, 225–6.

[195]"In quibus duobus consistit tota hominis perfectio," Gundissalinus, *De divisione*, 5.1.

Noble science is divided into two main branches: divine and human science (*divina et humana scientia*). Divine science is none other than the Scriptures, but Gundissalinus will not mention this again in the treatise. When he talks of divine science later in the text, he clearly and unequivocally is referring to Aristotle's theology. There is no room for confusion, because the context in each case is very clear. It is clear as well that the Scriptures are taken to be, as was the case for Hugh, one of the major parts of knowledge as a whole, and that the essential distinguishing attribute between divine and human science is the source of that knowledge—i.e., God directly, in the case of the Scriptures, and man, in the case of human science. Therefore it is not necessarily of consequence which faculty in the soul is at play when a human accesses that knowledge.[196] Human science, on the other hand, is the proper subject matter of the work, and is characterized as that knowledge that "is recognized to be discovered by human reason, like all arts that are called liberal."[197] The liberal arts do not constitute *all* of the sciences for Gundissalinus, as is clear from the fact that he dealt with many other disciplines outside the trivium and quadrivium,

[196]Some scholars have insisted in seeing in this main division a radical distinction between a human, rational, philosophical wisdom, and a theological, Christian wisdom. For instance, Fedora seems to agree with van Steenberghen on one such account in Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 27–8. For Gundissalinus, as well as for Hugh and Augustine, as should be clear, there is only one wisdom. There are, however, two kinds of *scientia* for Gundissalinus, but, as previously stated, they are distinguished by their source, and not by the human faculty or methods involved. Furthermore, we cannot really affirm that only human science is rational. Gundissalinus does not say anything about the methods of divine science, which is still referred to as *sacra pagina*, and not yet as theology, as it would be in the thirteenth century. Nevertheless, he probably agreed with both Augustine and Hugh in that the main method at play is the interpretation of texts in which human reason is indeed important, not for the actual generation of the contents of that knowledge—since God is taken to be the author—but presumably for the discovery of what God actually meant.

[197]"Quae humanis rationibus adinventa esse probatur ut omnes artes que liberales dicuntur," Gundissalinus, *De divisione*, 5.8–11.

but they seem to be paradigmatic examples of what a science is. Furthermore, arts, including the liberal arts, are of two kinds: those that deal with eloquence, like grammar, poetics, rhetoric and human law, and those that are concerned properly with wisdom, that is, those that either illuminate the human soul towards the knowledge of truth, or kindle the love of goodness. Those arts, in fact, constitute the sciences of philosophy.[198] Gundissalinus does not explain the exact nature of the relationship between these two kinds of science. It is not, in any case, the main aspect of subdivision of the sciences which he wants to propound, and thus, perhaps, he only wanted to emphasize again the primacy of wisdom. Some disciplines would have then a higher status resulting from how significantly they contribute to that ultimate goal.

Now we arrive in the prologue at an account of philosophy itself, which Gundissalinus takes from Isaac ben Solomon Israeli's *Liber de definicionibus*. Isaac Israeli (c.832–c932) was a Jewish thinker who wrote in Arabic, and about whom we do not know many biographical details. Besides a number of medical works, there are several extant philosophical works preserved in a number of manuscripts in Arabic, and in translations into Hebrew and Latin. He was quoted by Jewish and Latin philosophers even in the thirteenth century. The *Liber de definicionibus* was apparently translated twice in Toledo by the same people who translated al-Fārābī's *Enumeration of the Sciences* and in similar circumstances: there is an incomplete translation attributed to Gundissalinus,

[198] "Ad sapienciam uero pertinent omnes, que animam hominis uel illuminant ad cognicionem ueritatis uel accendunt ad amorem bonitatis, et hec omnes sunt philosophie sciente," Gundissalinus, *De divisione*, 5.14–16.

and then a complete one by Gerard of Cremona. Quotations drawn from this works are found even in thirteenth century writers such as Albert the Great and Thomas Aquinas.[199] The passages selected by Gundissalinus serve only to support the general thesis that he did not, in fact, want to deviate from the traditional line, even if Isaac's work belongs to a different tradition. Gundissalinus could have chosen to stress the differences between the new texts and the textual tradition he inherited—Boethius, Augustine, Isidore and others—but he did not.[200]

Gundissalinus begin his quotation of Isaac's account of philosophy with the affirmation that there are indeed two kinds of definitions to be given for philosophy, one from its effect (*ex effectu*) and other from its properties (*ex proprietate*). According to the latter definition, philosophy is the "assimilating *assimilacio* of the human to the work of the creator according to human virtue."[201] The assimilating of something to the work of the creator is defined without further explanation as the perception of the truth of things—the truth of the cognition of them things, Isaac says, and of their operation according to

[199]A thorough account of Isaac's biography and the textual tradition of most of his extant philosophical works together with an English translation and commentary on his most significant writings, as well as a study of Isaac's philosophy, can be found in A. Altmann and S.M. Stern, *Isaac Israeli: A Neoplatonic Philosopher of the Early Tenth Century: His Works translated with comments and an outline of his Philosophy* (Chicago: University of Chicago Press, 2009). Gerard of Cremona's translation is in Isaac Israeli, *Liber de definicionibus*, ed. J.T. Muckle, Archives d'histoire doctrinale et litteraire du moyen age, 12 (1937–38). In what follows, I give references to that edition.

[200]Isaac's major influence is al-Kindi; see Altmann and Stern, *Isaac Israeli: A Neoplatonic Philosopher of the Early Tenth Century*, xviii. Obviously, there could have been other factors involved in choosing this text in particular. For example, it could have been the only one available to him for this particular doctrine. However, Isaac's text can, in fact, can be seen as an elaborate, Aristotelian account of some of the ideas which we saw deployed by Hugh as well, thus confirming a certain continuity of thought with Gundissalinus.

[201]"Assimilacio hominis operibus creatoris secundum uirtutem humanitatis," Gundissalinus, *De divisione*, 6.1–2 = Isaac, *De definicionibus*, 303.4–6.

what agrees the truth.[202] It is not exactly clear how this *assimilacio* is related to a perception of the truth, but, in any case, Isaac immediately adds that this perception amounts to grasping the four natural causes of things. Staying with Isaac's text, Gundissalinus then provides an account of the four causes: material, formal, efficient, and final. Each one, except the material cause, he says, is of two modes, corporeal and spiritual. A corporeal final cause is like, for example, that of a house, which is made so that somebody can live in it; a spiritual final cause is like that of the union of body and soul in man, which, Isaac says, is made so that truth is manifested to the man, and so that he can discern between right and wrong.[203]

This distinction, very puzzling in itself, is useful for Gundissalinus, because it lets him stress the idea of *scientia* as having to do fundamentally with man being the union of flesh and spirit, as he indeed had said early on. The corporeal part of man has a role to play in *scientia*, because a part of *scientia* is in fact about man's corporeal life. After introducing Isaac's definitions Gundissalinus can then relatively smoothly refer back to one of Isidore's definitions, namely that philosophy is the knowledge of human and divine things, together with the study of living well.[204] Philosophy *ex effectu*, on the other hand, is, as Gundissalinus states next quoting anew from Isaac, the integral cognition by a human being of himself.[205] This is so because man, being a conjunct of

[202]"assimilacio uero operibus creatoris est percepcio ueritatis rerum, scilicet ueritas cognicionis earum et operacionis secundum quod conuenit ueritati." Gundissalinus, *De divisione*, 6.2–4 = Isaac, *De definicionibus*, 303.6–8.

[203]Gundissalinus, *De divisione*, 6.24–7.3 = Isaac, *De definicionibus*, 304.10–20.

[204]Isidore, *Etymologiae*, II.24 1–9.

[205]"Philosophia est integra cognitio hominis de se ipso," Gundissalinus, *De divisione*,

body and soul, has, in principle a sort of immediate access to all that is, both substance and accident. This is, of course, the same idea put forth by Augustine and Hugh, i.e., that wisdom can, in principle, be attained by following the traditional motto: "Know thyself." Gundissalinus certainly found in Isaac a source that is to some extent continuous with ideas of this kind.

Something similar can be gathered from the explanation Gundissalinus brings up, again quoting from Isaac, as to how philosophy is called love of wisdom. The key obviously lies in what we take wisdom to be. Here Isaac, and thus Gundissalinus, characterizes wisdom, as he had done with philosophy, *ex effectu* and *ex proprietate*. According to its property, wisdom is described as "the truth of knowledge (*scientia*) of first sempiternal things."[206] The first sempiternal things are, in turn, characterized as things that are eternal by their nature "such as the species, which are the end and the complement of generation, the genera, which are superior to them, the genera of the genera, until one reaches the truly first genus which is created from the power of the Creator without mediator."[207] Truth, for its part, is simply that which is (*id quod est*), as opposed to falsehood, which is that which is not some thing (*id quod non est aliquid*). The passage is obscure, yet we can gather, at least, that wisdom is for Isaac ultimately intellectual in nature, and has to do with getting

7.17–18. This corresponds to Isaac, *De definicionibus*, 306.2–3. Here Isaac's text in Latin translation differs minimally.

[206] "Sapiencia est ueritas sciencie rerum primarum sempiternarum," Gundissalinus, *De divisione*, 8.18–19 = Isaac, *De definicionibus*, 307.3–4.

[207] "Res antiguas natura sicut species que sunt prime generacionis et genera earum et genera generum usque ad primum genus uere creatum ex uirtute creatoris nullo mediante," Gundissalinus, *De divisione*, 8.19–22 = Isaac, *De definicionibus*, 307.4–9.

as close as possible to the Creator. For Gundissalinus, of course, the Creator must be God; therefore wisdom is, again just as in Augustine and Hugh, getting as close as possible to God, which in turn implies knowing the first genera of all things. There is still a gap between the wise man and God, for the wise man in this account is acquainted not with God Himself, but with the first, eternal, immediately created genus. Wisdom is not, therefore, actually partaking in God's nature, but maximally approximating Him—a state of contemplation, not of identification.

Wisdom *ex effectu* is described as the completion of intellectual virtue, so that it arrives at correct judgments, say, of truth and falsity, or of what is possible, impossible, and necessary, without any type of sophism.[208] Gundissalinus' text here is difficult to decipher. Here again we have an obscure passage that Gundissalinus takes from Isaac but this time as a close paraphrasis instead of a direct quotation. In Isaac's text, as translated by Gerard of Cremona, there follows an account of eight different kinds of sophisms that the wise man should be able to recognize and avoid. This account is not in Gundissalinus. It is made clearer in that account that the idea is that whoever has wisdom has that extra capacity to sort out propositions, and thus to be able to tell right from wrong.

Thus wisdom also serves to make the person more intellectually virtuous.

[208] "Sapiencia est comprehensio uirtutis intellectualis secundum exitum eius, quod est in duabus extremitatibus contradictiones de uero et falso, cum scilicet talis est contradictio ut eius extremitates diuidant uerum et falsum in omni materia necessitatis et possibilitatis et impossibilitatis absque omni genere sophismatis," Gundissalinus, *De divisione*, 9.14–17. This corresponds roughly to Isaac, *De definicionibus*, 307.27–308.3.

One of the implications of this view seems to be that, for Gundissalinus, the wise man is not "up there" entranced, so to speak, in the knowledge of the first eternal things—in the contemplation of God. Rather, the wise man continues to live, and wisdom causes there to be this particular, virtuous effect on him. Isaac's texts may have served Gundissalinus precisely because they convey an idea of wisdom that is much more integrated with *scientia*, since, in some way, wisdom is both a looking up to God, yet also entails keeping one's feet on the ground. It is not surprising then, that, in winding up this section on philosophy in his prologue, Gundissalinus states that the intention of philosophy is to grasp the truth of all the things that are, to the fullest extent that is possible to man.[209] Gundissalinus has thus established that philosophy is "noble" *scientia* of the human type—as opposed to divine *scientia* i.e., the Scriptures—and that it is primarily about gaining knowledge of first eternal things, the mission requirement being to know all things as well as possible. He then begins his general account of how the different disciplines are classified. The general classification is none other than Aristotle's division into practical and theoretical sciences, each of which is, in turn, divided into three types—natural, mathematical, and divine, in the case of the theoretical. Before stating that classification scheme, however, Gundissalinus tries to explain how it originates with the help mainly of sporadic quotations from al-Ghazzālī and Avicenna.[210]

[209]"comprehendere veritatem omnium que sunt, quantum possibile est homini," Gundissalinus, *De divisione*, 9.21–22.

[210]From al-Ghazzālī Gundissalinus uses the work that is generally known as al-Ghazzālī's *Metaphysics* and that he translated—probably with the help of John of Seville—from the original Arabic *Maqāṣid al-falāsifa* or *The Aims of the Philosophers*. For some time there were doubts among scholars regarding the status and authorship of this work because its

The first step is to describe all the things that are; the truth of this description is ultimately the intention of philosophy. The basic division of things, Gundissalinus states, quoting al-Ghazzālī, is between things made by our human labour and will, such as our laws and our constitutions, and things that were not made by us, such as God, the angels, the animals, and all natural things.[211] Gundissalinus then provides more details for this account. Of all things, he says, one did not ever take or assume being, namely God—the Trinitarian God, adds Gundissalinus, making clear that he is giving a Christian interpretation to al-Ghazzālī's text—while all other things were created. Creatures, in turn, are divided into those that were created before time (*ante tempus*), like angels and matter (*hyle* in the Latin text), those that were created *with* time, like the celestial objects and the elements, and the rest, which were created after time. Of the latter, some do not ever cease to be—all souls, for example—and some do cease to be at some point. Finally, of those of the latter type—i.e., created, non-eternal beings—some are natural, like animals, inanimate natural objects such as rain and hail, and some are artificial, that is, created out of man's will and art.[212] This turns out to be the basis for

contents go against al-Ghazzālī's philosophical commitments in other works. The work is, in fact, al-Ghazzālī's exposition of the ideas of the philosophers he will attack in his *Tahāfut al-falāsifa*. See Dominique Salman, "Algazel et les Latins," *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 10–11 (1935–36): 103–127. I will use the Latin translation that appears in al Ghazzālī, *Algazel's Metaphysics: A Mediaeval Translation*, ed. J. T. Muckle (Toronto: St. Michael's Medieval Studies, 1933). Gundissalinus's quotation from Avicenna come from the *Logic*, which is part of Avicenna's massive treatise *Kitāb al-Shifāʾ*. The Latin translation can be found in Avicenna, *Opera Philosophica*, (Venice, 1508) réproduction en facsmilé agrandi (Louvain: Edition de la bibliotèque S.J., 1961), 2–12.

[211]Gundissalinus, *De divisione*, 10:1–5 = Ghazzālī, *Metaphysics*, 1:20–25.

[212]Gundissalinus, *De divisione*, 10–11. This passage has parallels in other works by Gundissalinus and was surely taken from Arabic sources. See Baur's remarks in Ludwig Baur, "Untersuchung," in *De divisione philosophiae*, by Dominicus Gundissalinus (Münster:

the uppermost division of the sciences. Things are, in fact, either artificial or non-artificial—natural, eternal, pre-time, post-time, etc.—and thus, the sciences are first divided into practical sciences, by means of which we know "the dispositions of our own works," and theoretical, by means of which we know everything else that has being.[213]

Gundissalinus is here quick to point out that knowing the dispositions of our own works has, in fact, the ultimate goal of instructing us in how to behave. The practical sciences are thus not exactly about knowing per se, but rather about knowing how to act. Gundissalinus stresses this in the next few lines when trying to make clear in what precisely the practical-theoretical distinction consists: the practical sciences make us know (*cognoscere*) what must be done, whereas the theoretical sciences make us know what must be understood (*intellegi*); one is "in effect", the other one "in intellect"; one is about the execution of works, the other about cognition. The argument for this is taken from Avicenna's *Logic*, and is not easy to follow as it is compressed into just a few lines.[214] Avicenna's premises certainly just seem to be thrown out there, without further explanation being given. The argument goes as follows: there are two main things that can be perfected in the soul, namely knowledge (*scientia*), and operation (*operatio*). Since philosophy is conceived for the sake of the soul, it is necessary that philosophy be divided as well into

Aschendorff, 1903), 187, n2.

[213]"ideo philosophia primo loco diuiditur in duo: quorum unum est, quo cognoscimus disposiciones nostrorum operum; alterum est, quo cognoscimus omnia alia que sunt," Gundissalinus, *De divisione*, 11:11–13.

[214]See Avicenna, *Opera Philosophica*, 2.

the perfection of knowledge and the perfection of operation. Operation belongs to what Gundissalinus translates as the "sensible" part of the soul (*partis sensibilis*); speculation belongs to the rational part. The distinction—again, new in Gundissalinus's treatise—in any case, is placed there seemingly just to stress that philosophy belongs strictly to the rational part of the soul, and that therefore its perfection is essentially perfection in knowledge. However, the rational part can have knowledge of the artificial, and also of the non-artificial, that is, of what man cannot do, and also of what he can do. It is precisely the perfection in knowledge about man-made things that, from the point of view of philosophy, can help perfect operation, namely by arriving at knowledge about how to behave. In conclusion, "the goal of speculation is to conceive propositions with a view to understanding, but the goal of the practical is to conceive propositions with a view to acting."[215]

The theoretical sciences get much more attention, but Gundissalinus seems here to be struggling with the collation of his sources. His goal seems to be explaining Aristotle's tripartite division of the theoretical sciences as originating from a division of things just as he dad done with the practical-theoretical distinction. He starts this subsection of the prologue with a long quotation from Avicenna. However, Avicenna's division does not seem to help him arrive at what he wants in a straightforward manner. Avicenna divides things into several categories and subcategories according to their having or not hav-

[215]"Finis speculatiue est conceptio sentencie ad intelligendum; finis uero practice est conceptio sentencie ad agendum,"Gundissalinus, *De divisione*, 12:7–9.

ing motion, being conceivable or not being conceivable without motion, being conceived insofar as having matter or not being conceived insofar as having matter, and so on.[216] In the end, Gundissalinus cannot really tie these distinctions to the three theoretical sciences, and instead chooses to present an alternative view taken from al-Ghazzālī's *Metaphysics*.

According to some other thinkers (i.e., al-Ghazzālī), Gundissalinus says, the Avicenna's subdivision of things, and the way of thinking about them, can be understood also in the following manner: all things that are understood either (1) exist (*sunt*) totally outside or beyond (*extra*) matter and motion, or (2) exist (*sunt*) in matter and motion.[217] Among the things in the first group, al-Ghazzālī says, we have, for example, God and the angels, but also being and privation, the cause and the caused, and the like. Of these, there are some (1a) for which it is impossible to appear or manifest themselves (*existere*) in matter—e.g., God and the angels—and others (1b) that, even if it is not necessary for them to manifest themselves (*existere*) in matter, sometimes they do, for example, cause and unity, which can be said of a body and of an angel.[218] Similarly, the things in group (2) are subdivided into some (2a) that neither can exist nor can be understood (*intelligi*) as existing except in

[216] See Gundissalinus, *De divisione*, 12:15–13:26, taken from Avicenna's *Logic*, ch. 1.

[217] "Omnia que intelliguntur aut omnino sunt extra materiam et motum [...] aut omnia sunt in materia et motu,", ibid., 14.3 and 14.11. This corresponds to the passage in Ghazzālī, *Metaphysics*, 3, but there are some minor differences in the text of this edition with respect to Gundissalinus's quotation.

[218] "ex hiis quedam sunt que impossibile est existere in materia, sicut deus et angelus; et quedam sunt, quibus licet no sit necesse existere in materia, accidit tamen eis existere in materia, ut unitas et causa—corpus enim dicitur unum et dicitur causa sicut et angelus dicitur causa et unus," Gundissalinus, *De divisione*, 14.6–11.

their own, particular matter (*materia propria*) like man, vegetable and animal, and, in fact, all corporeal species; and some (2b) that *can* be understood as existing without a particular matter, that is, some that even though cannot have being without matter, are not tied, so to speak, to this or that matter in particular. Examples of the group (2b) are figure, quadrature, curveness and the like.[219] This subdivision is therefore based first in how the things actually exist, whether in or outside of matter and motion, and second in how they are understood, whether they are associated with matter or not.

Gundissalinus then ties this to Aristotle's tripartite division of the theoretical sciences by quoting again from Avicenna: one part of the these sciences, physics, is speculation about those things that are not separated from their matter either in being or in understanding (*in intellectu*); another, mathematics, is speculation about things separated from matter in understanding but not in being, and yet another one, theology or metaphysics, is speculation of things separated from matter both in being and in understanding.[220] Physics is then about things of group (2a), mathematics about things of group (2b), and theology about things of group (1).

At this point, Gundissalinus introduces Boethius by name perhaps to give some authority to what he had just presented from al-Ghazzālī and Avicenna without attribution. According to Gundissalinus, Boethius said that "physics

[219]"ex hiis quedam sunt, que nec possunt esse, nec possunt intelligi esse nisi in materia propria ut homo, uegetabile, animal, celum, terra, metallum et relique species corporee; et quedam sunt, que possunt intelligi esse sine materia propria, ut figura, quadratura, rotunditas, curuitas et similia, que quamuis non habeant esse nisi in materia, tamen ad esse suum non est necessaria eis una materia pocius quam alia," Gundissalinus, *De divisione*, 14.12–18.
[220]Ibid., 14.19–15.6.

is unabstract (*inabstracta*) with motion, mathematics is abstract with motion and theology abstract without motion."[221] Even though this seems to be, at first sight, a rather different formulation of the tripartite division of the sciences, some modern scholars have argued that it can actually be interpreted as a reformulation of Avicenna's claim. Indeed, if we take 'abstracta' here to mean "separated from matter in understanding," and "without motion" to mean "separated from matter in being," the passage basically repeats what Gundissalinus took from Avicenna. The interpretation of 'abstracta' as "separated from matter in understanding" can be justified by looking at Gundissalinus's views on abstraction, which he, again, takes straight out of Avicenna and which he presents later in *De divisione* 28–30. There, abstraction, which can be of many levels, is explained as apprehension of forms in the understanding, that is, separation of the form from the matter. Physics would not involve making that separation, but mathematics and theology would. On the other hand, reading "without motion" as meaning "separated from matter in being," is not that clear. It is suggested, nevertheless, by the description of the first subdivision of things in the quotation from al-Ghazzālī just discussed. Things belong to groups (1) or (2) depending on whether they exist in or outside matter and motion. In an odd way, then, we could say that things of group (1) are with motion, whereas things of group (2) are without motion. So, for example, both physics and mathematics deal with things of group (1), so they are about

[221] "phisica est inabstracta et cum motu, mathematica abstracta et cum motu, theologia uero abstracta et sine motu,", Gundissalinus, *De divisione*, 15.7–9.

things with motion in this sense. So, in spite of the oddity, especially of saying that mathematics is with motion, Gundissalinus seems to be coherent with his sources.[222]

The problem, however, is that this is not what Boethius said. We saw this passage earlier in Chapter 1, but it is worth repeating it again here. It comes from *De trinitate* II and reads:

> There are three speculative parts [of science], natural [science], in motion unabstract (*in motu inabstracta*) and unseparable (ἀνυπεξαίρετος) (it considers the forms of bodies with matter, which forms cannot be separated in reality from their bodies) [...] mathematical [science], without motion unabstract (*sine motu inabstracta*) (it investigates forms of bodies apart from matter and therefore apart from motion, which forms, however, being in matter, cannot be really separated from bodies), theological [science], without motion abstract (*sine motu abstracta*) and separable (for the divine substance is without either matter or motion.)[223]

Not only Gundissalinus omits the short elaborations after each of the sciences

[222]This is the interpretation of this issue given both by Fidora and Hugonnard. See Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 41–45 and Henri Hugonnard-Roche, "La classification des sciences de Gundissalinus et l'influence d'Avicenne," in *Études sur Avicenne*, ed. J. Jolivet and R. Rashed (Paris: Les Belles Lettres, 1984), 41–75. Gundissalinus, by the way, repeats the exact same formulation with respect to mathematics ("abstract with motion") when he talks about geometry later in the treatise, see Gundissalinus, *De divisione*, 103.

[223]"Nam cum tres sint speculativae partes, naturalis, in motu inabstracta ἀνυπεξαίρετος (considerat enim corporum formas cum materia, quae a corporibus actu separari non possunt, [...] mathematica, since motu inabstracta (haec enim formas corporum speculatur since materia ac per hoc sine motu, quae formae cum in materia sint, ab his separari non possunt), theologica, sine motu abstracta atque separabilis (nam dei substantia et materia et motu caret)." Boethius, *De Trinitate*, II.5–16.

and drops the Greek word ἀνυπεξαίρετος from the text, but also, more importantly, he changes the description of mathematics and writes what seems to be the complete opposite of Boethius's view. For Boethius, mathematics is without motion and unabstract, whereas for Gundissalinus it is with motion and abstract. At first sight, one might be tempted to think that Gundissalinus is simply misquoting Boethius. Upon more careful reading, however, what seems to be happening is rather that Gundissalinus is interpreting Boethius and translating him, so to speak, to the terms of the al-Ghazzālī and Avicenna quotations. This passage from Boethius, in fact, was seen as problematic by other thinkers of the twelfth century. Thierry of Chartres, Gilbert of Poitiers and Clarembald of Arras all were puzzled by Boethius's use of the words *abstracta* and *inabstracta*. It seems odd to say that mathematics is unabstract.[224] As remarked in Chapter 1, Boethius seems to be using the word *inabstracta* to render Aristotle's ἀχώριστα, meaning "unseparable from matter" and implying also that the unseparability is ontological rather than, for example, epistemological.[225] For Gundissalinus, however, this meaning would translate, if we follow the interpretation just given, into what he calls "with motion," which is how he puts it in this passage. Boethius's distinction in/without motion in the original text, on the other hand, does not seem to be related to being but to how the things are understood. Boethius says that, in the case of mathematics

[224]For a detailed discussion of these authors regarding this issue, see Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus*, 40–41. Merlan also deals with different medieval interpretations of Boethius in Philip Merlan, *From Platonism to Neoplatonism* (The Hague: Martinus Nijhoff, 1953), 71–73.

[225]See 65 above.

things are considered apart from matter and therefore apart from motion; this indeed ties his distinction to Gundissalinus's notion of abstraction. So, mathematics being without motion for Boethius results in Gundissalinus saying that it is abstract. The end result is an odd formulation and a misleading quotation, but it seems that Gundissalinus is basically "fixing" Boethius's text to make it conform to his understanding of the Arabic sources.

Gundissalinus's next move in the text is to introduce another passsage that supposedly also follows from the quotations from al-Ghazzālī and Avicenna. This passage would be new to most of Gundissalinus's readers. According to Aristotle, Gundissalinus says, there are three species of science (*scientia*):

> one that speculates about what can be moved and destroyed (*movetur et corrumpitur*), like the natural [science], a second one about what can be moved but not destroyed, like mathematics (*disciplinalis*), and a third that considers what can neither be moved nor destroyed, like divine [science].[226]

The passage is, in fact, similar to one in Aristotle's *Physics*, but with important differences. The original reads as follows:

> So that we have three fields of inquiry (πραγματεῖαι), concerned respectively with things motionless, things that, though in motion, are imperishable, and things perishable.[227]

[226] "una speculatur quod mouetur et corrumpitur ut naturalis, et secunda quod mouetur et non corrumpitur ut disciplinalis; tercia considerat quod nec mouetur nec corrumpitur ut diuina," Gundissalinus, *De divisione*, 15.12–15.

[227] "διὸ τρεῖς αἱ πραγματεῖαι, ἡ μὲν περὶ ἀκινήτων, ἡ δὲ περὶ κινουμένων μὲν ἀφθάρτων δέ, ἡ δὲ περὶ τὰ φθαρτά," Aristotle, *Physics* II.7, 198a29–31.

Besides modifying the order of the disciplines, Gundissalinus talks about science (which would be ἐπιστήμη for Aristotle, not πραγματεία), adds the verb "to speculate," uses both motion and destructibility for all disciplines as opposed to just for the second in Aristotle, and specifies the name of the sciences. All but the last textual difference can be explained, as Fidora does, by pointing to an Arabic source for the text. Except for the naming of the sciences, indeed, the text corresponds to Latin translations of the *Physics* based on Arabic texts.[228] Gundissalinus's original contribution is thus naming the different sciences. The context in *Physics* II.7, however, makes it clear that Aristotle is not talking about the tripartite division of the sciences we have seen in Boethius, Hugh and Gundissalinus. He seems to be putting forth a different division of the sciences, or, actually, of fields of inquiry. In the chapter, he talks about the different types of causes and how, often, the formal, efficient and final cause coincide. In general, Aristotle says, this happens in things that cause motion by being themselves moved. These things are what physics is all about.[229] So, the type of inquiry that is about things in motion in general is physics. There is another type that is about things without motion, presumably metaphysics. Of the things with motion, some are perishable and some are not. Aristotle does not say this explicitly but he surely is referring here to sublunar and celestial objects respectively, which thus implies a subdivision of physics into two parts based on the kind of things studied. In this subdivision, there is no ma-

[228]For a thorough comparison of the passage in different translations and manuscripts, see Alexander Fidora, "Nota sobre Domingo Gundisalvo y el Aristóteles Arabus," *Al-Qantara* XXIII.1 (2002): 201–208, especially p. 205.

[229]*Physics*, II.7, 198a28.

thematics; there is only physics and metaphysics. There is no indication in this passage that Aristotle is taking the inquiry into celestial objects as equivalent to mathematical astronomy—the closest candidate within mathematics—and much less to mathematics as a whole as Gundissalinus would have it; Aristotle seems to be referring rather to celestial physics, the kind of inquiry he undertakes, for example, in *De Caelo* II. Again, Aristotle does not say, but he is certainly not using these distinctions to point to the tripartite division of the theoretical sciences as Gundissalinus writes. This may be Gundissalinus once again modifying his source in the light the previous presentation. However, from the previous discussion about the sciences in Gundissalinus, it is very hard to see how the difference between physics and mathematics would have to do with whether a thing is perishable or not, when all along the distinction between the two sciences has been presented as being between a thing *understood* with or without matter. In any case, these two passages, the one from Boethius and this from Aristotle, are notable also in that Gundissalinus names his sources. The names of both Boethius and Aristotle surely resounded in his readers' ears as important, and Gundissalinus may have felt the urge to show how his views were in line with the two authorities.

The subsection on the theoretical sciences ends with a short account of their utility. It is new text taken from al-Ghazzālī, but it should not sound discordant to ears accustomed to hearing from the likes of Augustine and Boethius. The utility of the theoretical sciences is, Gundissalinus quotes, to know the dispositions of all the things that have being, so that the forms of every-

thing get traced in our souls according to their own order, just as visible form is traced in a mirror. That tracing or drawing of forms into our souls is supposed to be of the same perfection as the soul itself, because the soul's ability to receive that image or tracing is, in fact, one of its very properties.[230] This account, in fact, resembles the idea Hugh brought up in the *Didascalicon*—and also, in general sense, in his theory of knowledge—of the soul being capable of receiving and internalizing the forms of things as some sort of imprints.

This, in any case, completes the theoretical sciences, and so, brings us next in the prologue to an account of the practical sciences. These are, however, quickly taken care of by simply stating that they are divided into ethics, family affairs and political science, which, in turn, come from the fact, Gundissalinus explains, again quoting from al-Ghazzālī, that we behave and have exchanges at three different levels: from the point of view of ourselves only, with the family, and with all other humans in general. From each level stems a branch of the practical sciences.[231] If we recall, Hugh also dispensed with explaining the practical sciences in great detail, and instead presented them in essentially the same terms as Gundissalinus.[232]

The prologue ends with a short, introductory discussion of logic. The technical details of logic will be discussed at greater length later in the treatise.

[230]"Utilitas es cognoscere disposiciones omnium que sunt ad hoc ut describatur in animabus nostris forma tocius esse secundum ordinem suum, quemadmodum forma uisibiles describitur in speculo; huismodienim descripcio in anima nostra est perfectio ipsius anime, quoniam aptitudo anime ad recipiendum eam est proprietas ipsius anime" Gundissalinus, *De divisione*, 15.16–23 = Ghazzālī, *Metaphysics*, 2.3–9.

[231]Gundissalinus, *De divisione*, 16:3–17:2, which paraphrases Ghazzālī, *Metaphysics*, 2.

[232]See Hugh, *Didascalicon*, II.19, 37–38.

At this point, Gundissalinus only wants to to affirm that—in general, and just as we saw in Boethius and as we saw that Hugh reiterated—logic is both part and instrument of philosophy. Gundissalinus, however, introduces the discussion in different terms. He starts by noting that some things are known and some are unknown (*nota/ignota*). Knowing, as he uses the term here, is to be understood in the sense of knowing in an absolutely certain way. In this way we know, for instance, as Gundissalinus points out, that one plus one equals two, and that the whole is bigger than the individual parts. The key to all is, however—as Gundissalinus adds, bringing up a famous Aristotelian principle that he, however, takes from al-Ghazzālī—that nothing becomes known, except through something already known. Furthermore, he continues, logic is the only science through which we can get at the cognition of the unknown through the known.[233] Logic is thus necessary for the acquisition of all the theoretical sciences, but since logic is about propositions (*propositio*), grammar is also necessary. Again, it is the case that logic and grammar are both part and instrument of philosophy.

The rest of the book is a fairly detailed description of the different disciplines, without much in the way of an account of *scientia*. First, there is a general but extended description of the three main subdivisions of the Aristotelian theoretical sciences: natural, mathematical, and divine science. The description itself is based mainly on al-Fārābī, with various references to Isidore, Boethius

[233]"Sola ergo logica est sciencia que docet per notum peruenire ad cognicionem ignoti," Gundissalinus, *De divisione*, 18.5–6. This comes from chapter 1 in al-Ghazzālī's *Logic*; the Latin text can be found in al Ghazzālī, *Logica et Philosophia*, reprint of Venice, 1506 edition (Frankfurt: Minerva, 1969).

and others. In this section, however, Gundissalinus methodically deals with each type of science, and before any mention of their particularities, he first talks about the genus and matter of each, with quotations from Avicenna and al-Ghazzālī.[234] After dealing with divine science, which, as we have seen, clearly refers to Aristotelian divine science, and not to *sacra pagina*—and much less to theology in the scholastic, thirteenth century sense—Gundissalinus turns to extended accounts of particular sciences. Interestingly, these accounts, which take almost two thirds of the length of *De divisione*, do not follow the order of the Aristotelian division, but rather the liberal arts curriculum, although with the addition of non-standard disciplines taken from al-Fārābī—optics, science of weights and mechanics, all three included next to the mathematical disciplines, and coming from al-Fārābī—and, most surely under the influence of Avicenna, also medicine, which is placed, interestingly although without much in the way of justification, between the disciplines of the trivium and the quadrivium.

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To sum up, Gundissalinus presents a complex picture of *scientia*, with new elements imported from the Arabic tradition and reinterpretations of the traditional texts—Boethius above all. The general idea of *scientia* nevertheless, in essence, is still that of knowledge—theoretical knowledge, that is—that contributes towards wisdom. Many details, as we have seen, although presented

[234]Gundissalinus, *De divisione*, 19–43.

under the light of al-Ghazzālī, al-Fārābī, Isaac and Avicenna, still remind us of elements in Hugh and Augustine. Certainly, Gundissalinus did not introduce an abrupt break with the tradition, but rather seems to have enriched it with new elements. This was expected as he is one of the first to deal with the new texts. As far as the education curriculum is concerned, however, his account does not go too far way from the liberal arts tradition. Instead of a new curriculum based on an Aristotelian division of the sciences, he ultimately offers what is mainly a reformed liberal arts curriculum, with new disciplines and developments from Arabic sources.

Chapter 4

John of Salisbury

The last thinker to be studied in this dissertation is John of Salisbury, who came a generation after Gundissalinus and Hugh. After him, the next clear example of writing about science would take us to the thirteenth century, and to authors dealing directly with Aristotle's philosophy of science—figures such as Grosseteste, with his commentary on the *Posterior Analytics*, or even Aquinas and his remarks about *scientia* appearing in various places within his works. Salisbury's *Metalogicon*, however, clearly belongs with the thinkers we have been studying. The conception of *scientia* that we get in that work, even though rather vague in comparison with that depicted in Hugh's writings, is clearly within the same line of thought.

To be sure, the *Metalogicon*—a book written in the 1160s—was not meant to be a philosophical treatise, but rather, mostly a diatribe.[235] We cannot

[235]The Latin text of the *Metalogicon* can be found in John of Salisbury, *Ioannis Saresberiensis Episcopo Carnotensis Metalogicon Libri IV*, ed. C. C. J. Webb (Oxford: Clarendon Press, 1929). There is a recent French translation with an extended introduction: John of Salisbury, *Metalogicon*, trans. François Lejeune (Québec: Les Presses de l'Université Laval,

expect of this work anything but a vague picture of the kind of arguments that a fairly educated audience would be able to accept. Thus, it is valuable in our investigation because it can point in the direction of the traditional account, while also giving us an idea of the kinds of changes that would more palatable for readers just entering into the "new" world of Aristotle. Any account of *scientia* here, therefore, will likely be closer to what it was according to the tradition, rather than what it would become, or could become, in the future. This work, therefore, is important as a testimony to the conception we are seeking.

The work is, then, a diatribe. It is, in fact, mostly a defence of logic against a non-identified group of people bundled together under the name of Cornificius, their fictitious leader. The Cornificians are harshly depicted throughout Book I as being representative of everything that makes a bad school truly bad. They are full of sophistry, have a taste for disputes for the sake of disputes, and like to engage in meaningless contests. They put a misleading emphasis on coherence, and want to change the way the liberal arts are taught. They are a pervasive group of people, who sometimes enter the cloister, but cannot be brought back to their senses by monastic life. Sometimes they become impostors claiming to be physicians after reading the works of Galen and Hippocrates and just being able to produce flashy quotes and aphorisms devoid of any substance.[236] Their most wondrous claim, however, and the one that shows their true danger,

2009). The latest English translation is John of Salisbury, *The Metalogicon of John of Salisbury*, trans. Daniel D. McGarry (Berkeley: U of California Press, 1955).

[236]See Salisbury, *Metalogicon*, book I. The charge of imposture is in chapter 4.

is their contention that no study is necessary. They claim, John says, that eloquence is a gift that is either given or not given to a particular person, and thus that there is nothing anyone can do to improve his or her lot.[237] The gol of these miscreants and pretenders is to get rid of logic and the study of logic; that is part of their ultimate objective of destroying all the paths that lead to philosophy.[238] Generally speaking, John counters these claims by appealing to three basic principles, namely the significance of reason, the importance of cultivation of knowledge, as well as the overall priority of virtue and wisdom. In the deployment of these principles, which are essentially the same ones stressed by Hugh and Gundissalinus, John also provides us with some thoughts about the nature and role of *scientia*. He defends logic, not because logic is important per se, but because it is necessary for the pursuit of philosophy and wisdom. John is indeed cautious also about the excessive use of dialectics, and pleads for moderation in terms only a bit less acerbic than those used by clearly antagonistic figures such as Rupert of Deutz.[239] He also wants to change the way logic is taught and, indeed, most of his book can be read as a description of what he takes to be the right curriculum to follow, which is now based directly on Aristotle's writings, instead of on commentaries and glosses. The goal is not to abandon the liberal arts, but to approach them in a novel way. He can be considered, therefore, a critic from within the system.

[237]Salisbury, *Metalogicon*, I.7. We should recall that this is also the claim that Hugh decries, and wants to refute in the preface to the *Didascalicon*. Since that part of the text is only present in one group of manuscripts, Taylor speculates that perhaps it was added later. See Hugh, *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*, 174n3.

[238]Salisbury, *Metalogicon*, I.10.

[239]Rupert was briefly mentioned at the beginning of the chapter on Hugh, see page 83.

The first part of John's defence is, indeed, an account of the arts, where he echoes common themes of the tradition, although John's purpose in this section is ultimately to convince the reader of the importance of education. At the beginning of chapter eleven in Book I, he characterizes an art as "the reason (*ratio*) that, through its abbreviation, naturally makes what is possible more readily accomplished."[240] In the rest of the chapter, he elaborates: the arts are ways of helping human nature, because human nature by itself would probably take longer routes. The arts, on the contrary, point to a more direct path, and thus enable man to accomplish more difficult things. However, the arts come from human nature; they originated, John continues, in three natural dispositions or talents (*ingenia*) with which man is endowed and which can and should be cultivated, namely perception, memory, and reason. These dispositions are called vigorous because they naturally make man prone to initiate the investigation of things. Once the investigation is ongoing, practice and study makes it easier to find and accomplish new things, giving rise to the series of rules and precepts that constitute the different arts.[241] John does not provide precise characterizations of the three *ingenia*. He only says that our human nature makes it so that we perceive some things that repose in our memory; reason examines those things, and renders a judgment about the nature of each one of them. That judgment is perfect and true, except, John says clumsily, if reason has made a mistake in something.[242] We have to wait until

[240]"Est autem ars, ratio, quae compendio sui naturaliter possibilium expedit facultatem," Salisbury, *Metalogicon*, I.11 (838A).

[241]Ibid., I.11, especially 838C.

[242]"Ratio vero quae percepta et commendanda vel commendata sunt, studio diligenti ex-

Book IV for a more complete account of reason in order to try to understand how it is that reason can sometimes get things right and sometimes get things wrong. At this point in the text, John is preoccupied with the arts, and all he says additionally about reason is that it is the faculty that examines things, and that establishes the arts as some sort of finite knowledge (*scientia*) of infinite things.[243] He then continues praising the liberal arts, which he calls the "first" arts, harkening back to the traditional account before Martianus, and to Hugh's praise of the trivium and quadrivium. John, indeed, seems to be very fond of Martianus's allegories, for he uses them several times throughout the *Metalogicon* to give rhetorical support to his claims.[244] The arts are divided, as usual, into the trivium and the quadrivium, and they are so important that, according to John, the ancients were able to explain almost everything with them: the disciplines of the trivium helped them determine "the sense of any formulation," whereas those of the quadrivium gave them access to "the secrets of all nature."[245]

Despite that grandiose description, the quadrivium is totally ignored by John in the rest of the *Metalogicon*. The remainder of the text up to Book IV is an account of a curriculum for the trivium based primarily on Aristotle's logical

aminat, et ex natura singulorum, de singulis (nisi forte labatur in aliquo,) verum profert incorruptumque judicium." Salisbury, *Metalogicon*, I.11 (838B).

[243]"Ratio, eorum quae sensibus, aut animo occurrunt, examinatrix animi vis est, et fidelis arbitra potiorum, quae rerum similitudines dissimulitudinesque perpendens, tandem artem statuit, quasi quamdam infinitorum finitam esse scientiam," ibid., I.11 (839A).

[244]References to Martianus are numerous; Lejeune counts no less than 14. See the index entry in John of Salisbury, *Metalogicon*, trans. François Lejeune (Québec: Les Presses de l'Université Laval, 2009), 386.

[245]Salisbury, *Metalogicon*, I.12 (839D).

books, with Book III being a fairly detailed description of the *Categories*, *On Interpretation* and *Topics*. The remainder of Book I deals with grammar, whereas Book II is about logic and dialectics in general. Logic is presented as the theory or doctrine that deals with the discussion or examination of things (*ratio disserendi*), and by which the activity of prudence is made firm.[246] Prudence, in turn, is characterized as the activity that allows true things to be clearly seen, known, and appreciated, an account John paraphrases from Cicero.[247] Prudence, which is Cicero's translation of the Greek φρόνησις, and which John says is the mother of all virtues, certainly plays an important role in John's theory of knowledge and he will say more about it in Book IV. At this point, his remarks are rather brief, and some of them are similar to Hugh's views on the *Didascalicon*, although now combined with praise for the Peripatetics, and references to Cicero, Seneca and other Roman writers. John says, for instance, that logic is the first art to be studied, just as Hugh had argued. The greatest good (*summum bonum*), also, is wisdom for both John and Hugh. Wisdom at this point, however, is described only as the cognition (*cognitio*) of truth, and is said to produce, as fruits, the love of the good and the practice of virtues.[248] Wisdom is also that which is necessary to render dialectics beneficial. Dialectics is only a tool, whose utility is given by the

[246]"logica est ratio disserendi, per quam totius prudentiae agitatio solidatur," Salisbury, *Metalogicon*, II.1 (857C). Later in the text it is also called *scientia disserendi*, see II.3 (859B). *Scientia* here may seem to be synonymous with art, but as will become clear after discussing book IV, it probably has a more specific and special meaning.

[247]"Prudentia vero tota consistit in perspicientia veri et quadam solertia illud examinandi," ibid., II.1 (857D). Cf. with Cicero, *De officiis*, I.15–17.

[248]Salisbury, *Metalogicon*, I.1 (857C).

subject matter to which it is applied.[249]

It is in Book IV, then, where we find more details about John's conception of knowledge and *scientia*. Before getting into that, however, John talks first about Aristotle's *Prior* and *Posterior Analytics*, which are new to the tradition, describing them as very important, in spite of their very technical approach. The brief discussion of the *Posterior Analytics* is one of the first accounts ever for that book in the Latin West. It is famously described as being poorly translated and too hard. It is about the theory of demonstration, but, John says, this is something that has fallen into disuse and, although very important, only geometers and astronomers still seem to use it.[250] Demonstrative science (*scientia demonstrativa*), John explains a bit later, proceeds from immediate principles—i.e., principles that do not need proof—which, although they seem to be the most remote from us, are yet the first in nature. This is because we think that the particulars we sense are closer to us, when in reality, John says, the universals that we get through induction, and that are the principles of demonstration, are in their simplicity and their nature, better known, and thus prior.[251] These remarks serve as the starting point for John to embark on an account of the different powers (*vires*) or practices (*exercitia*) of the soul, starting with sense-perception, and afterwards moving on to imagination, reason, and intellect. Reason and perception presumably correspond to the dispositions (*ingenia*) John had talked about earlier, but he does not state that

[249]Salisbury, *Metalogicon*, II.9.
[250]Ibid., IV.6.
[251]ibid., IV.8 (919C). John's remarks regarding universals obtained through induction come straight from Aristotle. See Aristotle, *Posterior Analytics*, I.18, 81a38-b9.

explicitly. Perception is prior to the rest, because it is perception that provides the soul with input for the other powers; it is indeed the ultimate origin of all the arts. It produces images of singular things—not of universals—that either are stored in memory or function as the origin of imagination. John does not like Calcidius's description of perception as being the body's sensation of external things that strike it with varying degrees of intensity. That sensation, if intense enough, eventually makes it to the soul, and, depending on whether it is agreeable or unpleasant, originates pleasure and pain.[252] John prefers Aristotle's account, from the *Posterior Analytics*, of perception as a power of the soul that is stimulated by the sensations of the body and generates images of realities. Those images are either passed on directly to the imagination, or stored in memory.

Imagination, John continues, is born from that endless input of images. Imagination not only remembers the images of past perceptions, but also creates new ones.[253] That is the true origin of sentiments (*affectiones*): the imagination when forming a painful image of the future based in painful past occurrences gives rise to fear, and when forming a pleasant image based on pleasant past experiences gives rise to hope, and so on.[254] Imagination in general, indeed, is the source of opinion according to John. It first emits a judgment about perceptions when it asserts, for instance, that such thing is black or white, or

[252]Salisbury, *Metalogicon*, IV.9 (921C–D). See Calcidius, *Platonis Timaeus interprete Chalcidio: cum eiusdem commentario*, ed. John Wrobel (Leipzig: Teubner, 1876), §194 (237).
[253]Salisbury, *Metalogicon*, IV.9 (921D–922A). Cf. Aristotle, *Posterior Analytics*, II.19, 99b33–35.
[254]Salisbury, *Metalogicon*, IV.10 (922B–D).

hot or cold. After an image is formed, and when it is recalled imagination emits a second judgment—an opinion—ascribing either present qualities to things that are remote or future qualities to present things.[255] Since these opinions can be either true or false, and not only in people with otiose reason, but also in those with the most acute sense, the soul strives for certainty, giving rise to the virtue of prudence.[256] Unlike Aristotelian φρόνησις, which is clearly distinguished from art, science, and wisdom, John's prudence is directly related to *scientia*.[257] John repeats his definition of prudence from Book II—a virtue that rests on the capacity to investigate and to clearly see that which is true. He adds now, however, that once prudence reaches the truth, "it becomes *scientia*, whence it is evident from perception we get imagination and from those two opinion, and from opinion prudence, which when gaining force, results in *scientia*."[258]

Scientia, is clearly what is attained at the level of reason, which is one step up from imagination. The soul, John says,

> is excited by sense-perceptions and, spurred on by prudence, summons its power and applies itself with energy to shunning the errors of sense and opinion. By means of that effort that is truly its own, the soul sees more clearly, understands more firmly, and judges

[255]Salisbury, *Metalogicon*, IV.11 (923A).
[256]Ibid., IV.11 (923B).
[257]See Aristotle, *Nicomachean Ethics* VI.3, specially 1140a23–b11 for an account of φρόνησις. John uses Cicero as his source. See Cicero, *De officiis*, I.15ff.
[258]"Cum autem veritatem fuerit assecuta, in speciem scientiae transit. Ex his patet, quod cum de sensu imaginatio, et ex his duobus opinio, et ex opinione prudentia nascatur, quae in scientiam convalescat," Salisbury, *Metalogicon*, IV.12 (923C–D).

> more purely. That power is called reason. For reason is the power of spiritual nature that serves to distinguish between material and immaterial realities, and that aims at giving sure and certain judgments over them."[259]

Reason is, therefore, an essential power of the soul, one that makes it possible to arrive at certain judgments, thus escaping from the problems arising out of mere opinion. Reason needs to be able to distinguish between the material and the immaterial because, in the end, as John says next in the text, the judgments of reason are universal, eternal, and thus of a nature distinct from the sensible and singular.[260] Reason, John claims in the next chapter, paraphrasing from Augustine, "transcends all senses and its judgments penetrate corporeal and incorporeal things[;] it contemplates the earthly things but strives for the heavenly."[261] Those certain judgments, we can conclude from what John has said in relation to prudence, constitute *scientia*.

What is not entirely clear, however, is what exactly constitutes the relation between reason and prudence. From what we can gather, it seems that, for John, even though the soul has all these intellectual faculties, it still needs some kind of directing force to eventually arrive at good judgments and *scien-*

[259]"anima itaque pulsata sensibus, et prudentiae sollicitudine validius concussa, seipsam exerit, collectisque in unum viribus, dolos sensuum et opinionum studet intentius declinare. Sua vero intentione perspicacius videt, firmius tenet, et sincerius judicat. Et haec est vis, quae ratio nominatur; si quidem ratio est potentia spiritualis naturae, discretiva rerum corporalium et incorporalium, quae res appetit firmo et sincero examinare judicio," Salisbury, *Metalogicon*, I.15 (924D).

[260]Ibid., IV.15 (924D).

[261]"Porro ratio transcendit omnem sensum, et judicium suum, etiam in corporalibus et spiritualibus rebus immergit. Contemplatur omnia inferiora, et ad superiora prospectum intendit," ibid., IV.16 (925D). Augustine has remarks similar to these at various points in his work. Here John seems to be referring, however, to Augustine, *De libero arbitrio*, 2.3–5.

tia. Prudence would be that directing force, but it is not clear whether it is something that is always there in the soul, simply needing perhaps some cultivation, or alternatively, something that is given from outside in some way or other. Possibly prudence comes by way of the grace of God, for instance. The grace of God, indeed, has also a role to play in the pursuit of wisdom, as we will see shortly.

John is also not clear about the exact meaning of *scientia*. It is clear that the next step up in knowledge from *scientia* is wisdom, but at one point in the John seems to agree with some older thinkers, mostly Romans such as Cicero and Quintilian, as Lejeune points out,[262] in that *scientia* has to do with knowledge (*notitia*) of the temporal and sensible whereas wisdom (*sapientia*) is about the spiritual and intellectual; it is said, John points out, that *scientia* is of human things, whereas *sapientia* is of the divine.[263] However, from the way he repeatedly talks about reason and given that the fruit of reason, so to speak, is *scientia*, it seems more likely that, for John, *scientia* refers exclusively to the purely immaterial and spiritual. It also seems, in fact, that John is trying to reconcile such a diverse spectrum of material—from his own tradition and from the newly translated texts—that he is still either undecided on the details of some of the issues or, given the mostly rhetorical character of the *Metalogicon*, simply not paying attention to them. In any case, his conception

[262]John of Salisbury, *Metalogicon*, trans. François Lejeune (Québec: Les Presses de l'Université Laval, 2009), 295, n.64.

[263]"Inde est, quod majores prudentiam vel scientiam, ad temporalium et sensibilium notitiam retulerint: ad spiritualium vero, intellectum, vel sapientiam. Nam de humanis scientia, de divinis, sapientia dici solet." Salisbury, *Metalogicon*, IV.13 (923D).

of *scientia*—namely that it is knowledge at the spiritual level with a view to *sapientia*—seems to be more in line with that of Augustine and Hugh, than with the Roman authors he quotes.

The judgments of reason—i.e., *scientia*—John says, are eternal and consecrated by the "first reason" (*ratio primitiva*), which he does not hesitate in calling the wisdom of God (*sapientia Dei*). The wisdom of God, in fact, ordained and disposed all judgments of reason in all eternity, and thus we can find that wisdom dwelling openly in universal principles, and in all truths.[264] The wisdom of God, therefore, would be the ultimate standard for reason and *scientia*. Man can aspire to wisdom because of the intellect, which is the highest power that is possible in the soul, one level up from reason. The intellect, according to John, is, in fact, that which attains what reason aims for: it penetrates the work of reason, and takes and stores for itself, with a view towards wisdom, that which reason prepared and acquired.[265] John thinks therefore, just as Hugh does, that the intellect is the highest power in the soul, and the instrument with which to acquire wisdom. Yet, John also believes that this power is not available to everybody. He agrees with Plato in the *Timaeus* in that it is only for God and for a select few.[266] Hugh seems to think that the intellect resides in the soul of all humans, and thus, in principle, that all

[264]"Haec autem sunt, in quibus ab initio, et sine initio, aeternae constitutionis decretum et suae dispositionis seriem sanxit ratio primitiva, quam si dixero, Sapientiam Dei, utique non errabo. Infinita quidem hujusmodi, vel in ipsis veris, palam est invenire," Salisbury, *Metalogicon*, I.15 (925A).

[265]"Nam intellectus assequitur, quod ratio investigat: si quidem in labores rationis intrat intellectus, et sibi ad sapientiam thesaurizat quod ratio praeparans acquisivit," ibid., IV.18 (926D).

[266]Ibid., IV.18 (927A).

humans are capable of attaining wisdom, especially if they engage in reading, meditation, and, in general, in the cultivation of knowledge. John, on the other hand, believes that wisdom is not something that comes from nature; rather, it is something that God bestows by His grace.

What John does not say is whether the would-be wise person needs to do something in order to receive that grace. It is not clear whether the person needs some special preparation in the soul—perhaps a requisite state of *scientia*—before he or she can receive the grace of wisdom. We could be tempted to think, along the lines of Augustine's account of conversion, that what is needed is some access to the light of God, something that, more than placing the would-be wise person in the right direction in the case of conversion, puts him or her in a state of knowledge in which he or she is more likely to receive the power of the intellect from God. John does not talk about anything like this, but what is certain is that it is not a matter of faith. John quotes Hugh in his description of faith. Faith is essentially something in between opinion and *scientia*.[267] It means taking for certain what is not certain, and so, John says, it is very close to "vehement opinion", as Aristotle observed.[268] Nevertheless, it affirms things without the certainty of *scientia*. For John, faith is important for human life as it is, for instance, necessary for contracts and business transactions to work. It is also important in religion because it provides

[267]"Unde magister Hugo: Fides est voluntaria certitudo absentium supra opinionem, infra scientiam constituta,", Salisbury, *Metalogicon*, IV.13 (924B). The quotation comes from Hugh, *De sacramentis*, 330D.

[268]Salisbury, *Metalogicon*, IV.13 (924A). Aristotle said this of πίστις, which Boethius translated as *fides*. See Aristotle, *Topica*, IV.5, 126b18, and Boethius, *Topicorum Aristotelis*, 950D.

beliefs in things that can be expected from God as well as in things that we cannot see.[269] This, of course, is very similar to Augustine's view on faith, namely that it is a true belief held without being really know, without being really *scientia*. Faith is for John therefore just a higher kind of opinion, still very low in the scale of powers of the soul. It does not have any particularly important role to play in the attainment of wisdom. *Scientia* is higher than faith in John's hierarchy. Higher still, is wisdom, which is reserved for just a few humans. *Scientia* is thus for John the highest level of knowledge to which man can normally aspire.

It is this limit to the aspirations of man with regard to wisdom what most strikingly differentiates John of Salisbury's account of *scientia* from the other accounts we have seen in this dissertation. In all other authors—Augustine, Hugh and Gundissalinus—man has all the rational capabilities already in place in the soul. The attainment of wisdom is a matter of developing that rationality, gaining *scientia*, and reaching the higher level at which the contemplation of God takes place. Still, however, John's account, does not deviate significantly from the main tenet of *scientia* as related to the quest of wisdom that, as has been shown, is common to the thinkers of the twelfth century studied here. With John, that study is complete. It is now time to summarize the main results of the investigation.

[269]Salisbury, *Metalogicon*, IV.13 (924A).

Concluding Remarks

The discussions presented in this dissertation clearly show that there was, indeed, a non-trivial preoccupation with *scientia* and scientific disciplines in the twelfth century. Certainly, there is in some authors a distinct conception of *scientia*, more or less developed depending on the thinker, but generally in line with Augustine's ideas on the issue. We can gather that *scientia* in the twelfth century is, generally speaking, theoretical knowledge that serves man in the quest to wisdom—the ultimate and most worthy intellectual state for a Christian, a state of contemplation of God.

We can also see how the preoccupation with *scientia* may be understood in relation to the intellectual developments during this time period. As briefly saw in chapter 2, the twelfth century is characterized by the rise of theology in parallel with the affirmation of dialectics as one of the main tools with which thinkers tried to make sense of their sacred texts and of their faith. Even though there does not seem to exist yet in this time period a clear consciousness of theology as a distinct discipline whose status and place within the traditional disciplines needed to be established, there were debates about the extent to

which those traditional disciplines could be applied to the interpretation of Scriptures. As we saw in chapter 1, the traditional disciplines were those of the liberal arts—a group of subjects of study with an already long history by the time the Christians started to find proper justifications for their inclusion in programs of study around the sixth century. Augustine represents one of the most important approvers of the liberal arts curriculum in the Latin West, with Boethius, among others, providing some important translations and commentaries that served, for many centuries to come, as textbooks for students. By the twelfth century, then, with most of the mathematical disciplines in very poor shape mainly because of the lack of proper study material, but with the disciplines of the trivium in full development, the liberal arts were clearly established as the reference subjects when it came to thought about *scientia*.

It is with the liberal in the background that controversies arose about the proper use of pagan disciplines, especially dialectics. The problem does not seem to be the disciplines themselves, but perhaps the excessive, uncautious utilization of them. Later on, as we saw in chapter 3, Salisbury would try to solve this problem by appealing to the Augustinian principle of priority of the quest for wisdom—and, therefore, also the quest for the truth and the good—as the ultimate guide not only for the proper study of sacred texts and issues, but also for the development of the sciences. At the other end of the spectrum we have people like Abelard arguing that ancient philosophers were, in fact, precursors of the Christian faith, and that, therefore, their writings have an authoritative status on par with the Scriptures. Indeed, for Abelard, as it was

the case for other thinkers of the time as well, the pagan sources are just like the Scriptures, and, as such, they are also in need of interpretation in order to uncover their true symbolic meaning. The upshot of all this, independently of the actual arguments used by the different thinkers, is that there existed, in fact, background discussions about problems with the arts. It is clear that these discussions were not mainly about theology as a discipline, which seems to be rather a thirteenth century problem.

In any case, from that brief discussion in chapter 2, we can now understand with more clarity the context in which a figure like Hugh of St. Victor may have felt compelled to write a treatise about the sciences—the *Didascalicon*—in which, besides purely educational considerations addressed in all likelihood to students in the schools, he also provides a justification and explanation of the origin, classification and worth of the different sciences, even expanding the scope of the sciences beyond the traditional liberal arts. Almost the same could be said of Gundissalinus, who, now armed with freshly translated Arabic sources and more disciplines to account for, attacked the same problem

Hugh of St. Victor presents the most sophisticated and complete account of *scientia* among twelfth century thinkers. His conception of *scientia* is, in fact, integrated into a comprehensive view of human knowledge. As we saw in detail in chapter 2, knowledge for Hugh consists in a process of purification of being. On the lower end of this process, the soul acquires images of the material through sense-perception. Then, inside the soul, the faculty of reason, is in charge of forming abstract thoughts—thoughts that are more and more distant

from the material and the particular, and closer and closer to the more elevated spiritual and universal. At some point, high in the scale, intelligence takes over, and the soul eventually arrives at the highest state—the contemplation of God, wisdom. *Scientia* happens in the middle part of the process, when reason is at work producing purely theoretical knowledge. Thus, *scientia* is, at it was for Augustine, as we saw in chapter 1, a necessary step in the path towards wisdom.

From the discussions in chapter 2 we also get a clearer picture of the similarities and differences between Hugh and Augustine. Just to mention one such point of contrast, we have in both thinkers, for example, the idea that all that man needs to know is already in his or her own soul, and, therefore, in principle, the soul would be able to develop *scientia*, and even attain wisdom, by its own power. Augustine, however, refers repeatedly to faith as one thing that can help expedite that process of attaining wisdom; faith represents for him true beliefs that at some point would have to known fully. In Hugh's *Didascalicon*, on the other hand, the role faith plays in Augustine seem to be played by learning—the acquisition of *scientia*. This represents for Hugh a powerful justification for the pursuit of the different intellectual disciplines, which he classifies and presents in his work.

The idea of learning, however, is not limited to the traditional disciplines, but includes also the study of Scriptures. These, which constitute divine science, are simply taken to be of the two main kinds of knowledge, namely the one whose source is God; the other kind is called human science because it is

developed by human beings. The Scriptures are, thus, one of the two sides of learning, and, at least in Hugh's view—and also in Gundissalinus, for he too has this same conception—there is no way of confusing them with Aristotelian divine science, which is of human origin.

The discussion of the different classifications of the sciences in the chapters on Hugh and Gundissalinus helps us understand also the importance of the Aristotelian legacy in the Latin West before the translation movement that allowed thinkers to read Aristotle's scientific works was firmly established and texts were generally available. Mainly through the influence of Boethius's translations and commentaries, the Latin West knew of Aristotle's classification of the sciences. Both Hugh and Gundissalinus subscribed to that classification. Hugh, however, modified it to include the mechanical sciences—still theoretical sciences, although referring to practical activities such as agriculture and medicine. We saw in chapter 2 how Hugh justified this addition using an idea already expressed by Boethius—the idea that the sciences have their origin in the different attributes and aims of the soul. This idea, to which Gundissalinus and John of Salisbury also subscribe, is also one that helps us characterize twelfth century accounts of *scientia* and scientific discipline. There is certainly a continuity in thought in the twelfth century regarding *scientia* that we can gather from the analysis of the works by Gundissalinus and John of Salisbury in chapters 3 and 4. Neither Gundissalinus nor John present accounts of *scientia* as integrated with an overall view of knowledge as Hugh does, but they both subscribe to the same principles of priority of the pursuit

of wisdom, *scientia* as an important part of that pursuit, and *scientia* as purely theoretical.

As we saw, both thinkers, but especially Gundissalinus, tried to integrate the new sources available to them in their accounts, but in elements such as the fundamental view of *scientia* in relation to wisdom, and in the preeminence of the liberal arts in the curriculum, did not deviate too much from the traditional line. In the case of Gundissalinus, whose major sources are Arabic thinkers such as al-Fārābī and Avicenna, this resulted in sometimes very puzzling accounts and reinterpretations of the textual traditions, as in the case of the misquote of Boethius studied in detail in chapter 3. Problematic interpretation issues like this abound in the authors studied here. There is, certainly, the need of further study of the different sources some of them used for particular issues if we want to assess more clearly some of their claims. In the case of Gundissalinus, for example, such a study would have to include a good deal of the Arabic tradition, which would without doubt take us beyond the scope of an investigation on *scientia*, but that is necessary if we want to proceed further in time and understand the discussions in the thirteenth century. This is, in any case, only one of example of possible further research stemming from the present dissertation.

If we stay, however, within the main issue of the different conceptions of *scientia*, one of the main questions that we may ask after the present study has to do with what happens next in time in the Latin West. As is well known, and as it has been stated before, by the thirteenth century we have thinkers

discussing issues of *scientia* within the framework of Aristotelian philosophy of science. There are clear examples, however, of later authors—most notably Kilwardby, who has been mentioned a couple of times before—incorporating ideas of Hugh of St. Victor and Gundissalinus in their discussions. There are grounds, therefore, to suspect that some aspects of the conception of *scientia* studied here survived and informed the study and assimilation of Aristotelian *scientia* by thinkers in the Latin West. I believe, in fact, that the present study, which cannot pretend to be more than a first approach to a neglected issue, is part of the necessary background investigation that needs to be done if we are to properly understand the complete story of *scientia* in the Latin West medieval period.

Appendix

Aristotle on the subalternation of the sciences

In the *Posterior Analytics* I.2, Aristotle claims the we can say that we have scientific or unqualified knowledge (ἐπιστήμη) of something, as opposed to just incidental knowledge, only if both (a) we know that the cause (αἰτία) of the fact in question is its true cause, and (b) we know that the fact cannot be otherwise (71b10–13). According to Aristotle this type of knowledge is obtained only through demonstration (ἀποδέξεις), which is a technical term he defines as "a syllogism that enables us to know (scientifically) by the mere fact that we grasp it" (71b18). As any other syllogism, a demonstration is composed of three categorical propositions, two premises and a conclusion, each of which link a subject to a predicate or attribute. According to Aristotle, given the definition of demonstration and the nature of ἐπιστήμη, the premises must have a number of features or attributes. First, they have to be true for it is impossible to know that which is contrary to the fact (71b26–27). Second, they must be primary, immediate and indemonstrable, meaning that they should not require

any proof themselves (71b27–28); because of this requirement Aristotle also calls the premises of demonstration principles (ἀρχαι) (72a7–9). Third, they must be prior and causative of the conclusion for according to Aristotle we only have knowledge of something when we know its cause (71b30–32). That the premises should be prior to the conclusion here means that they are prior in the same sense in which a cause is prior to its effect. Finally, the premises should be better known than the conclusion not only in the sense that their meaning is understood, but also in that they are known as facts (71b33–34).

Later Aristotle elaborates on the last attribute. The idea is that a demonstration causes scientific knowledge. It is not only a matter of finding a cause for a fact that we have established as true, but rather to know a first principle immediately—i.e., without having to have a proof—and then, through a syllogism, to come to know the fact. We not only need to know the first principles before the fact, we also need to know them better. We need to know them better simply because they are the cause of the knowledge of the fact and, as Aristotle claims, "that which causes an attribute to apply to a subject always possesses that attribute in a still greater degree" (72a29–31). From this, Aristotle argues, it is clear that we need to have previous knowledge in order to know something further; we in fact need to know the principles (72a35–b4).

Aristotle continues the discussion of ἐπιστήμη introducing very precise and technical terms and reaching further conclusions about the first principles of demonstration. Another important feature is that they must be necessary and thus the premises must state relations between essential attributes of the gen-

era involved (75a18–20). The attributes in question must be attributes that belong *per se* to subjects, that is, attributes or predicates that of necessity must be asserted or denied of subjects: evenness or oddness of numbers, straightness or curveness of lines, and so on. The premises of a demonstration, therefore, must state *per se* connexions between the genera involved and thus it is impossible to prove a fact by passing from one genus to another (75a38–40). Aristotle gives the example of arithmetic and geometry: it is impossible, he says, to prove a geometrical proposition through arithmetic; even though the basis of the proof may be the same, it is not possible to apply the arithmetical demonstration of attributes of numbers to the geometrical demonstration of attributes of extended magnitudes, unless numbers and extended magnitudes were the same (75b3–8).[270] A further requirement for the premises of demonstration is therefore that they must be principles about one genus, and thus we can talk of different scientific disciplines that deal with different genera.

A science is thus a collection of principles and syllogisms that deals with a specific kind of things, a genus, that is its proper subject matter. So, for instance, for arithmetic the subject matter is numbers, together with all the properties that belong essentially to them. So we say that the subject genus of arithmetic is number. For geometry it is extended magnitudes and their properties; for music it is relations between numbers and the properties of these relations, and so on. A *scientia*, however, is not something that exists

[270]For Aristotle they are not the same, see *Categories* 4b22 ff.

apart from souls. It is a disposition (ἕξις) of the soul to demonstrate,[271] that is, to provide valid logical inferences based on universal principles. As such, it is an accident of a soul and, so, when we talk about a *scientia* in general, say, the science of geometry, we are talking about a non-substance species whose individuals are the particular sciences of geometry inhering in particular rational souls.

The premises of a demonstration therefore must be strictly about the science's subject matter and its essential attributes. Otherwise they will show a universal consequence only accidentally. For instance, if the subject genus of a science is human, we can only use essential properties of humans to demonstrate universal statements about them. If we use an accidental property, like whiteness or a premise about some other genus, say, dogs, we may well end up a true, universal fact about humans, but this fact would be improperly proved. It is only accidental that the fact is the case under this justification. However, Aristotle says in *Posterior Analytics* I.9, the exception is for instance when the propositions of harmonics are proved by arithmetics. These propositions, Aristotle continues without providing a specific example,"are proved in the same way [as any other genuine scientific demonstration], but with this difference: that while the fact proved belongs to a different science (for the subject genus is different), the grounds of the fact belong to the superior [science], to which the attributes belong *per se*" (76a10–14). The idea seems to be in general that a science s_1 can use as premises in its demonstrations the

[271] "ἡ μὲν ἄρα ἐπιστήμη ἐστὶν ἕξις ἀποδεικτική," *Nicomachean Ethics*, VI.6, 1139b30.

statements of a "higher" science s_0 if s_1 is subalternate to s_0, which is the case if the subject genus of s_1 is the subject genus of s_0 but with some sort of qualification. So, optics is subalternate to geometry because the subject genus of optics is also geometrical figures but with the qualification that they are to be considered only as they apply to visual phenomena. Indeed, for Aristotle optics deals with points, lines and so forth, just like geometry, but points, lines, etc., qua visible. If we understand optics this way it is clear that we can appeal to any universal statement about points and lines in general to prove statements in optics. Aristotle does not provide any further explanation of what kind of qualification can be admitted as the basis for subalternation of the sciences.[272] We can infer, however, that Boethius interprets Aristotle as admitting the case in which the subject genus of the subalternate science implies, at least semantically, the subject genus of the higher science. Boethius can therefore simply say, as we saw he did, that since 'geometrical figure' implies 'number', geometry is subalternate to arithmetic.

[272]See Richard D. McKirahan, *Principles and Proofs: Aristotle's Theory of Demonstrative Science* (Princeton, NJ: Princeton UP, 1992), chapter 5 for a modern discussion of these issues

Bibliography

Primary Sources

Abelard. *Theologia christiana*. Edited by E. M. Buytaert and C. J. Mews. Petri Abaelardi opera theologica: Corpus christianorum continuatio mediaevalis XII. Turnhout: Brepols, 1969.

———. *Theologia Summi Boni*. Edited by E. M. Buytaert and C. J. Mews. Petri Abaelardi opera theologica: Corpus christianorum continuatio mediaevalis XIII. Turnhout: Brepols, 1987.

Aristotle. *Metaphysics*. Translated by H. Tredennick. 2 vols. The Loeb Classical Library. Cambridge, MA: Harvard UP, 1933.

———. *Nicomachean Ethics*. Translated by H. Rackham. The Loeb Classical Library. Cambridge, MA: Harvard UP, 1934.

———. *Physics*. Translated by W. Wickstead and F.M. Cornford. The Loeb Classical Library. Cambridge, MA: Harvard UP, 1960.

———. *Posterior Analytics*. Translated by H. Tredennick. The Loeb Classical Library. Cambridge, MA: Harvard UP, 1960.

———. *Topica*. Translated by E.S. Forster. The Loeb Classical Library. Cambridge, MA: Harvard UP, 1960.

Augustine. *De doctrina christiana*. Edited by J. Martin. Corpus Christianorum Series Latina 32. Turnhout: Brepols, 1962.

———. *De libero arbitrio*. Edited by W. M. Green. Corpus Christianorum Series Latina 29. Turnhout: Brepols, 1970.

———. *De musica*. Edited by G. Marzi. Firenze: Sansoni, 1969.

———. *De trinitate*. Edited by W. J. Mountain and Fr. Glorie. Corpus Christianorum Series Latina, 50–50a. Turnhout: Brepols, 1968.

———. *On the Trinity : Books 8–15*. Edited by Gareth B. Matthews. Translated by Stephen McKenna. Cambridge: Cambridge UP, 2002.

———. *Retractationvm Libri II*. Edited by A. Mutzenbecher. Corpus Christianorum Series Latina 57. Turnhout: Brepols, 1984.

Avicenna. *Opera Philosophica*. (Venice, 1508) réproduction en facsmilé agrandi. Louvain: Edition de la bibliotèque S.J., 1961.

Berengar of Tours. *De sacra coena adversus Lanfrancum*. Edited by A.F. and F.Th. Vischer. Berlin, 1834.

Boethius. *Anicii Manlii Severini Boethii In Isagogen Porphyrii commenta*. Edited by G. Schepss and S. Brandt. Corpus scriptorum ecclesiasticorum Latinorum. Vienna: F. Tempsky, 1906.

———. *Consolatio Philosophiae*. In. *The Theological Tractates : The Consolation of Philosophy*, translated by S. J. Tester. Loeb Classical Library 74. Cambridge, MA: Harvard UP, 1973.

———. *De Trinitate*. In. *The Theological Tractates : The Consolation of Philosophy*. Loeb Classical Library 74. Cambridge, MA: Harvard UP, 1973.

———. *Institution Arithmétique*. Translated by Jean-Yves Guillaumin. Paris: Les belles lettres, 2002.

———. *Topicorum Aristotelis Libri Octo: An. Mal. Sev. Boetii interprete*. Edited by J. P. Migne. Patrologia Latina, 64: 909–1008. Paris: Garnier, 1854.

Calcidius. *Platonis Timaeus interprete Chalcidio: cum eiusdem commentario*. Edited by John Wrobel. Leipzig: Teubner, 1876.

Cicero. *De officiis*. Edited by M. Winterbottom. Oxford: Oxford UP, 1994.

Damian, Peter. *Lettre sur la toute-puissance divine [De divina omnipotentia]*. Latin and French. Edited and translated by André Cantin. Paris: CERF, 1972.

Descartes. *Meditationes Metaphysicae*. Edited by Charles Adam and Paul Tannery. Vol. 7. Oeuvres de Descartes. Paris: Vrin, 1964–1976.

Diels, H. *Die Fragmente der Vorsokratiker*. Berlin: Weidmannsche Buchhandlung, 1902.

Erigena, John Scot. *De divisione naturae*. Dublin: Dublin Institute for Advanced Studies, 1968.

Fārābī, al. *Catálogo de las ciencias*. Translated by Ángel González-Palencia. Madrid: Maestre, 1953.

———. *Iḥṣāʾ el-ʿulūm*. Translated by Ilham Mansour. Raʾs Bayrut, Lebanon: Markaz al-Inmāʾ al-Qawmīk, 1991.

Ghazzālī, al. *Algazel's Metaphysics: A Mediaeval Translation*. Edited by J. T. Muckle. Toronto: St. Michael's Medieval Studies, 1933.

Grosseteste, Robert. *Commentarius in Posteriorum analyticorum libros*. Edited by Pietro Rossi. Firenze: L.S. Olschki, 1981.

Gundissalinus. *De divisione philosophiae*. Edited by Ludwig Baur. Münster: Aschendorff, 1903.

Hugh of St. Victor. *De sacramentis christianae fidei*. Edited by J. P. Migne. Patrologia Latina, 176: 173–618. Paris: Garnier, 1854.

———. *De unione corporis et spiritus*. Edited by J. P. Migne. Patrologia Latina, 175: 285–294. Paris: Garnier, 1854.

———. *Hugonis de Sancto Victore Didascalicon : de studio legendi*. Edited by Charles Henri Buttimer. Washington, DC: Catholic University Press, 1939.

———. *Il "De unione corporis et spiritus" di Ugo di San Vittore*. Edited by A.M. Piazzoni. Studi medievali, 3rd ser., 1 (1980):861-868.

———. *The Didascalicon of Hugh of St. Victor : A Medieval Guide to the Arts*. Translated by Jerome Taylor. New York: Columbia UP, 1961.

Isaac Israeli. *Liber de definicionibus*. Edited by J.T. Muckle. Archives d'histoire doctrinale et litteraire du moyen age, 12 (1937–38).

Isidore of Seville. *Isidori Hispalensis Episcopi : Etymologiarvm sive originvm libri XX*. Edited by W.M. Lindsay. Oxford: Oxford UP, 1911.

Kilwardby, Robert. *De ortu scientiarum*. Toronto: The Pontifical Institute of Mediaeval Studies, 1976.

Martianus Capella. *The Marriage of Philology and Mercury*. In. Vol. II of *Martianus Capella and the Seven Liberal Arts*, translated by William H. Stahl and Richard Johnson with E.L. Burge. New York: Columbia UP, 1977.

Nicomachus of Gerasa. *Introduction to Arithmetic*. Translated by Martin Luther D'Ooge. London: Macmillan, 1926.

Plato. *Republic*. In. *Complete Works*, edited by John M. Cooper, 971–1223. Indianapolis, IN: Hackett, 1997.

Raban Maur. *De universo*. Edited by J. P. Migne. Patrologia Latina, 111: 9–612. Paris: Garnier, 1864.

Rupert of Deutz. *De omnipotentia Dei*. Edited by J. P. Migne. Patrologia Latina, 170: 453–478. Paris: Garnier, 1854.

———. *De voluntate Dei*. Edited by J. P. Migne. Patrologia Latina, 170: 437–54. Paris: Garnier, 1854.

Salisbury, John of. *Ioannis Saresberiensis Episcopo Carnotensis Metalogicon Libri IV*. Edited by C. C. J. Webb. Oxford: Clarendon Press, 1929.

———. *Metalogicon*. Translated by François Lejeune. Québec: Les Presses de l'Université Laval, 2009.

———. *The Metalogicon of John of Salisbury*. Translated by Daniel D. McGarry. Berkeley: U of California Press, 1955.

Secondary Sources

Altmann, A., and S.M. Stern. *Isaac Israeli: A Neoplatonic Philosopher of the Early Tenth Century: His Works translated with comments and an outline of his Philosophy*. Chicago: University of Chicago Press, 2009.

Baron, Roger. *Science et sagesse chez Hughes de Saint-Victor*. Paris: P. Lethielleux, 1957.

Baur, Ludwig. "Untersuchung." In *De divisione philosophiae*, by Dominicus Gundissalinus, 145–397. Münster: Aschendorff, 1903.

Berndt, Rainer, Matthias Lutz-Bachmann, and Ralph M.W. Stammberger, eds. *"Scientia" und "Disciplina": Wissenstheorie und Wissenschaftpraxis im 12. und 13. Jarhhundert*. Berlin: Akademie Verlag, 2002.

Bradshaw, David. "The Opuscula sacra: Boethius and Theology." In *The Cambridge Companion to Boethius*, edited by John Marenbon, 105–128. Cambridge: Cambridge UP, 2009.

Carriero, John. *Between Two Worlds: A Reading of Descartes's Meditations*. Princeton: Princeton UP, 2009.

Chenu, M.-D. "Imaginatio : Note de lexicographie philosophique médiévale." In *Miscellanea Giovanni Mercati Vol II*, 593–602. Vatican City: Biblioteca Apostolica Vaticana, 1946.

———. *La Théologie au douzième siècle*. Paris: Vrin, 1957.

———. "Les Magistri. La "science" théologique." In *La Théologie au douzième siècle*, 323–350. Paris: Vrin, 1957.

Clark, Mary T. "De Trinitate." In Stump and Kretzmann, *The Cambridge Companion to Augustine*, 91–102.

Coolman, Boyd Taylor. *The Theology of Hugh of St. Victor*. Cambridge: Cambridge UP, 2010.

Copleston, F.C. *A History of Medieval Philosophy*. London: Methuen, 1972.

Crombie, A.C. *Robert Grosseteste and the origins of experimental science, 1100-1700*. Oxford: Clarendon Press, 1953.

———. *The History of Science: From Augustine to Galileo*. New York, NY: Dover, 1995.

Dod, Bernard G. "Aristoteles Latinus." In *The Cambridge History of Later Medieval Philosophy*, edited by Norman Kretzmann, Anthony Kenny, and Jan Pinborg, 45–79. Cambridge: Cambridge UP, 1982.

Dod, Bernard G., et al. "Medieval Translations." In Pasnau, *The Cambridge History of Medieval Philosophy*, 793–832.

Dronke, Peter, ed. *A History of Twelfth-Century Western Philosophy*. Cambridge: Cambridge UP, 1988.

Décarie, Vianney. "La physique porte-t-elle sur des non-séparés?" *Revue de sciences philosophiques et théologiques* 38 (1954): 466–468.

Ellard, Peter. *The Sacred Cosmos: Theological, Philosophical, and Scientific Conversations in the Twelfth-Century School of Chartres*. Scranton and London: University of Scranton Press, 2007.

Endres, J.A. "Die Dialektike und ihre Gegner in 11. Jahrhundert." *Philosophisches Jarhbuch* 19 (1906): 20–33.

Evans, G.R. *Anselm and a New Generation*. Oxford: Clarendon Press, 1980.

Fakhry, Majid. *Al-Fārābī, Founder of Islamic Neoplatonism: His Life, Works and Influence*. Oxford: One World, 2002.

Fidora, Alexander. *Die Wissenschaftstheorie des Dominicus Gundissalinus*. Berlin: Akademie Verlag, 2003.

———. "Nota sobre Domingo Gundisalvo y el Aristóteles Arabus." *Al-Qantara* XXIII.1 (2002): 201–208.

Ghazzālī, al. *Logica et Philosophia*. Reprint of Venice, 1506 edition. Frankfurt: Minerva, 1969.

Ghellink, J. de. *Le mouvement théologique du XIIe siècle*. Bruges: Éditions de Tempel, 1948.

González-Palencia, Ángel. "Prólogo." In *Catálogo de las ciencias*, by al Fārābī. Madrid: Maestre, 1953.

Gregory, Tullio. "The Platonic Inheritance." In Dronke, *A History of Twelfth-Century Western Philosophy*, 54–80.

Guillaumin, Jean-Yves. "Introduction." In *Institution Arithmétique*, by Boethius, translated by Jean-Yves Guillaumin, vii–xcv. Paris: Les belles lettres, 2002.

Gutas, Dimitri. "Origins in Baghdad." In Pasnau, *The Cambridge History of Medieval Philosophy*, 11–25.

Hadot, Ilsetraut. *Arts libéraux et philosophia dans la pensée antique*. Paris: Études Augustiniennes, 1984.

Holopainen, Toivo J. *Dialectic and Theology in the Eleventh Century*. Leiden: Brill, 1996.

Hugonnard-Roche, Henri. "La classification des sciences de Gundissalinus et l'influence d'Avicenne." In *Études sur Avicenne*, edited by J. Jolivet and R. Rashed, 41–75. Paris: Les Belles Lettres, 1984.

Jeauneau, Edouard. "Le Prologus in Eptateuchon de Thierry de Chartres." *Medieval Studies* 16 (1954): 171–175.

Kleinz, John P. *The Theory of Knowledge of Hugh of Saint Victor*. Washington, DC: Catholic University, 1944.

Liccaro, Vincenzo. "Ugo di San Vittore di fronte alle novita delle traduzioni delle opere scientifiche greche e arabe," Actas del V congreso internacional de Filosofía Medieval, vol II, 919–926 (1979).

Longeway, John. *Demonstration and Scientific Knowledge in William of Ockham*. Notre Dame, Indiana: University of Notre Dame Press, 2007.

Lutz-Bachmann, Mathias, Alexander Fidora, and Andreas Niederberger, eds. *Metaphysics in the Twelfth Century: On the Relationship among Philosophy, Science and Theology*. Turnhout: Brepols, 2004.

Marenbon, John. *Early Medieval Philosophy*. London: Routledge, 1988.

Mariétan, Joseph. *Problème de la classification des sciences: d'Aristote à St-Thomas*. Paris: Alcan, 1901.

Marrou, Henri-Irénée. *Saint Augustin et la fin de la culture antique*. Paris: Éditions E. de Boccard, 1958.

Matthews, Gareth B. "Knowledge and Illumination." In Stump and Kretzmann, *The Cambridge Companion to Augustine*, 171–185.

McKirahan, Richard D. *Principles and Proofs: Aristotle's Theory of Demonstrative Science*. Princeton, NJ: Princeton UP, 1992.

Menn, Stephen. *Descartes and Augustine*. Cambridge: Cambridge UP, 1998.

Merlan, Philip. *From Platonism to Neoplatonism*. The Hague: Martinus Nijhoff, 1953.

Paré, G., A. Brunet, and P. Tremblay. *La renaissance du XIIe siècle: Les écoles et l'enseignement*. Ottawa: Inst. d'Études Médiévales, 1933.

Pasnau, Robert, ed. *The Cambridge History of Medieval Philosophy*. 2 vols. Cambridge: Cambridge UP, 2010.

Pedersen, Olaf. *The First Universities: Studium Generale and the Origins of University Education in Europe*. Cambridge: Cambridge UP, 1997.

Radding, C., and F. Newton. *Theology, rhetoric, and politics in the Eucharistic controversy, 1078-1079: Alberic of Monte Cassino against Berengar of Tours*. New York: Columbia University Press, 2003.

Resnick, Irven Michael. *Divine Power and Possibility in St. Peter Damian's De Divina Omnipotentia*. Leiden: Brill, 1992.

Robbins, F.E., and L.C. Karpinski. "Studies in Greek Mathematics." In *Introduction to Arithmetic*, by Nicomachus of Gerasa, translated by M.L. D'Ooge, 1–177. London: Macmillan, 1926.

Rorem, Paul. *Hugh of Saint Victor*. Oxford: Oxford UP, 2009.

Salman, Dominique. "Algazel et les Latins." *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 10–11 (1935–36): 103–127.

Schwegler, Albert. *Kommentar zur Metaphysik*. Tübingen: Fues, 1847.

Southern, R.W. *Scholastic Humanism and the Unification of Europe, Volume I: Foundations*. Oxford: Blackwell, 1995.

———. *Scholastic Humanism and the Unification of Europe, Volume II: The Heroic Age*. With notes and additions by Lesley Smith and Benedicta Ward. Oxford: Blackwell, 2001.

Spruit, Leen. *Species Intelligibilis: I. Classical roots and medieval discussions*. Leiden: Brill, 1994.

Stahl, William H. *The Quadrivium of Martianus Capella*. In. Vol. I of *Martianus Capella and the Seven Liberal Arts*. New York, NY: Columbia UP, 1971.

Stewart, H.F. "A Commentary by Remigius Autissiodorensis on the De Consolatione Philosophiae of Boethius." *Journal of Theological Studies* 17 (1916): 22–42.

Stump, Eleonore, and Norman Kretzmann, eds. *The Cambridge Companion to Augustine*. Cambridge: Cambridge UP, 2001.

Vessey, Mark. "Introduction." In *Institutions of Divine and Secular Learning and On the Soul*, by Cassiodorus, translated by James W. Halporn, 1–101. Liverpool: Liverpool University Press, 2004.