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A reception of the idea of the music of the spheres in the music theory of the twelfth and thirteenth centuries*

***Musica mundana* in the writings of twelfth century authors**

The twelfth century is often called the *aetas Boethiana* as it is distinguished by an increased interest in the works of Boethius, with special emphasis on his theological writings and *Consolatio*, which was very popular at the time. It is also true to say that his cosmological ideas were more frequently applied in the twelfth than in the eleventh century and that they (including the concept of the music of the spheres) became the subject of increasing interest to philosophers, and less so to music theorists. The reason behind this phenomenon was a growing specialization of issues relating to the theory of music, which finally led to its independence from the other areas of knowledge; yet this is not the only reason why the subject of the harmony of the spheres was again widely discussed in philosophical circles. An essential factor was the development of Neo-platonic philosophical schools, such as the famous School of Chartres. The interest in natural sciences in the School of Chartres and later in the Oxford School made the scientists of the time focus on the works of authors whose

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ideas were essential to the concept of the harmony of the spheres, among them such philosophers as Calcidius, Macrobius and Boethius. It is worth mentioning that many researchers think of the twelfth century as a kind landmark, in a sense, and compare it to the Carolingian Renaissance; in A. Kijewska's words:

Can we say that the twelfth century was the end of one era and the beginning of a new one? Is this really when the deep collapse of culture, science and theology essentially ended? The twelfth century was certainly an extraordinary period (...). It must not be treated, however, as the phase of history whose ideas shone exceptionally brightly against the dark background of the previous ages. The magnitude of the twelfth century lies not so much in the rejection of everything that had come before, but a creative continuation, in new conditions, of what was most valuable and innovative in the previous ages. And so historians gave the title of "renaissance" both to the Carolingian times and to the twelfth century.¹

The 'creative continuation' that A. Kijewska is talking about was only possible because the philosophers of this era were representing an intellectual movement whose distinguishing feature was its links with antiquity. These links (which were an attempt at a reinterpretation of the teachings of antiquity in the spirit of the Christian philosophy) were still quite indirect in the twelfth century; for example the bridge linking the scholars of the School of Chartres with antiquity was provided by the writings of philosophers who had focused on the preservation and passing on of the basic elements of ancient Greek and Roman knowledge.

Another remarkably relevant process which took place at the time, along with these transformations, is summarized by W. Seńko:

[In the twelfth century] a reevaluation of the Bible as the source of knowledge about nature took place. St. Augustine believed that nature was like a book for simpletons and that the *Bible* was the masterpiece to be used by sages who could draw from it all the teachings that man needed, by using allegorical and symbolic interpretation. In the twelfth century this way of thinking was reversed: nature itself became the source of real knowledge about the world, and whoever decided to adhere solely to the Bible was simply considered a fool.²

¹ A. KIJEWSKA, *Księga Pisma i Księga Natury, Heksameron Eriugeny i Teodoryka z Chartres* [The Book of Writing and the Book of Nature, the Hexameron by Eriugene and Thierry of Chartres], Lublin 1999: 256. All quotes from the Polish sources have been translated for the purpose of this paper.

² W. SEŃKO, *Jak rozumieć filozofię średniowieczną* [How to Understand Mediaeval Philosophy], Kęty 2001: 148.

This approach found its fullest expression in the School of Chartres, whose scholars frequently and very firmly expressed their opinions on the issue; such was the case with William of Conches, who said that those who, without trying to penetrate into the essence of things, in search of good reasons and explanations, wished to accept everything that had been written in the Bible were simply ignorant.³ Such theses often met with fervent opposition, so we should not be surprised with the way that William of St. Thierry opposed William of Conche's views in his letter to St. Bernard of Clairvaux.

An author who was not in any way connected to the School of Chartres or the Victorines but whose views can be considered representative of the early period of scholasticism⁴ was Honorius Augustodunensis (d. ca. 1151).⁵ His writings clearly remained under the influence of Anselm of Canterbury. Little is known of Honorius' life, apart from the fact that he probably taught in Autun and was a scholar and a poet.⁶ The three of his most important works are: *Clavis physicae* (based on Eriugena's *Periphyseon*), *De imagine mundi* and *Elucidarium Sive Dialogus De Summa Totius Christianae Theologiae*.⁷ In all of these works we find that the author was evidently inspired by Boethius' *musica mundana* theory. At the very beginning of *Clavis* (where he explains why he has chosen the dialogue form), Honorius mentions Severinus Boethius as one of

³ "Sed quoniam ipsi nesciunt vires naturae, ut ignorantiae suae omnes socios babeant, nolunt eos aliquid inquirere, sed ut rusticos nos credere, nec rationem quaerere, ut jam inipleatur propheticum: *Et sit sacerdos sicut populus* (*Isa. xxiv, 2; Osce iv, 9*). Nos autem dicimus, in omnibus rationem esse quaerendam, si autem alicui deficiat, quod divina pagina affirmat, sancto Spiritui et fidei est mandandum". William of CONCHES, *De Philosophia Mundi Libri Quatuor*, [in:] J. P. MIGNE, *Patrologiae cursus completus. Series latina*, Paris 1857–1866, Vol. CLXXII, col. 56.

⁴ S. SWIEŻAWSKI, *Dzieje europejskiej filozofii klasycznej*, [The History of Classic European Philosophy], Warszawa–Wrocław 2000: 469.

⁵ There is no agreement among medievalists as to whether 'Augustodunum' can be identified with 'Autun' (after e.g. S. Swieżawski, *Dzieje...* (2000): 469–472. The discussions on this subject are presented by M. Jamróz [in:] M. JAMRÓZ, *Bóg, świat i człowiek w pismach Honoriusza Augustodunensis* [God, the World and Man in the writings of Honorius Augustodunensis], Lublin 2008.

⁶ S. Swieżawski, *Dzieje...* (2000): 513.

⁷ The J. P. Migne, *Patrologiae...* (1857–1866) series also included a very interesting work published under Honorius' name entitled *De philosophia mundi Libri Quatuor*, although its real author was William of Conches. See: E. GILSON, *Historia filozofii chrześcijańskiej w wiekach średnich* [History of Christian Philosophy in Middle Ages], transl. S. Zalewski, Warszawa 1987: 566–567, footnote 80.

the philosophers he considered most relevant to his own thinking.⁸ Honorius' writings were well known at the time, indeed well enough for his description of hell (which he thought existed beneath the Earth) to provide the basis for the topography of Dante's inferno.⁹

Man was understood as a microcosm consisting of spiritual and corporeal substance. Because man's corporeal substance was thought to have consisted of four elements, he was called 'microcosmos'. Numerous analogies can be drawn from this: man's body is made of the elements of earth; blood of water; breath of air; and heat of fire. Our heads are round so to reflect the shape of the celestial spheres; the two eyes are like two celestial objects casting light on the other planets.¹⁰ The seven holes in a human head are like the seven whole tones which fill the universe with harmony. Our eyesight comes out of fire, hearing out of the air external to the body, and smell out of the air internal to the body; water gives us taste and earth touch.¹¹

Honorius' reasoning is clearly Boethian in origin as is his development of the concept of *musica humana*, although Boethius is not credited in the quoted fragments of *Elucidarium*.

Augustodunensis' sources for his *De imagine mundi* are similar: we distinguish four elements in the world: the earth, being the heaviest, occupies

⁸ "Cum multos mente intuear, non solum indoctos sed etiam nitore summe sapientie claros, nimium a tramite phisice rationis exorbitare, per ea que divina gratia illuminante perspicaci ratione inspexi omnes me scqui volentes accingor ad viam veritatis, Deo duce, revocarc. In quo opere quedam minus ratione exercitatis videbuntur absona, que tamen veritatem considerantibus summa auctoritate et vera ratione constabunt subnixa. Cuius stilum ideo verti in dialogum quia summis philosophis, Socrati scilicet et Platoni ac Tullio nec non nostro Augustino et Boetio, visum est id genus docendi quam maximam vim optinere introducendi". Honorius AUGUSTODUNENSIS, *Clavis phisice*, P. Lucentini (ed.), Roma 1974: 3.

⁹ S. SWIEŻAWSKI, *Dzieje...* (2000): 469.

¹⁰ The Sun and the Moon are meant here. Honorius knew that the Moon did not produce its own light but merely reflected the light of the Sun.

¹¹ "D[iscipulus]. Unde corporalis?—M[agister]. De quatuor elementis: unde et microcosmus, id est minor mundus dicitur: habet namque ex terra carnem, ex aqua sanguinem, ex aere flaium, ex igne calorem. Caput ejus est rotundum, in coelestis sphaerae modum: in quo duo oculi ut duo luminaria in coelo micant; quod etiam septem foramina, ut septem coelum harmoniae ornant. Pectus, in quo flatus et lussis versantur, simulat aerem, in quo venti et tonitrua concitantur. Venter omnes liquores, ut mare omnia flumina recipit. Pedes totum corporis pondus, ut terra cuncta sustinent. Ex coelesti igne visum, ex superiore aere auditum, ex inferiore olfactum, ex aqua gustum, ex terra habet tactum. (...) haec est substantia corporalis". Honorius AUGUSTODUNENSIS, *Elucidarium Sive Dialogus De Summa Totius Christianae Theologiae*, [in:] J. P. Migne, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 1116.

the central position in the system; water is lighter and it surrounds the Earth (already understood as a planet) and permeates it; the air fills the space between the Earth and the Moon; and the lightest element, fire, occupies the area between the sphere of the Moon and the firmament.¹² The sphere of air (between the Earth and the Moon) was, according to Honorius, inhabited by devils, whose bodies, as they appeared to people, were made of air.¹³ He called the sphere of fire (between the Moon and the celestial sphere) ether—which was used by angels to assume their astral bodies when they needed to be visible.¹⁴ A thesis that the air around the Earth is filled with devils was already present in the writings of St. Augustine. In his treaty *Concerning the Nature of Good* there are passages according to which fallen angels, having been punished, were consigned to the prison of hell, which was the lower part of the space of the air. This was colloquially known as “heaven” but should not be confused with the upper part of the celestial space, where the stars reside.¹⁵

¹² “Elementa dicuntur, quasi hyle, ligamenta, ὕλη autem est materia, ex quibus constant omnia, scilicet, ignis, aer, aqua, terra. Quae in modum circuli in se revolvuntur, dum ignis in aerem, aer in aquam, aqua in terram convertitur, rursus terra in aquam, aqua in aerem, aer in ignem commutatur. Haec singula propriis qualitatibus, quasi quibusdam brachiis se invicem tenent, et discordem sui naturam concordia foedere vicissim commiscent. Nam terra arida et frigida frigidae aquae connectitur; aqua frigida et humida humido aeri astringitur; aer humidus et calidus calido igni associatur; ignis calidus et aridus aridae terrae copulatur. Ex his terra ut puta gravissima imum, ignis ut puta levissimus, supremum obtinet locum, alia duo medium, quasi quoddam soliditatis vinculum. Quorum aqua gravior, terrae proximum, aer levior igni primum possidet locum”. Honorius Augustodunensis, *De Imagine Mundi Libri Tres*, [in:] J. P. MIGNÉ, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 121.

¹³ “Aer est omne quod inani simile, a terra usque ad lunam conspicitur, de quo vitalis spiritus haurietur. Et quia est humidus, ideo in eo volant aves: ut in aqua natant pisces. In hoc commorantur daemones, cum tormento diem iudicii praestolantes. Ex quo sibi corpora sumunt dum hominibus apparent”. Honorius Augustodunensis, *De Imagine...*, [in:] J. P. MIGNÉ, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 136.

¹⁴ “Ignis quartum elementum scribitur, quasi non gignis dicitur. A luna usque ad firmamentum extenditur. Is tantum est aere subtilior, quantum aer aqua tenuior, aqua terra rarior. Hic aether, quasi purus aer dicitur, et perpetuo splendore laetatur. De hoc angeli corpora sumunt, cum ad homines missi veniunt”. Honorius Augustodunensis, *De Imagine...*, [in:] J. P. MIGNÉ, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 138.

¹⁵ “Although they have already penalty received this hell, that is inferior smoky air as a prison, which nevertheless since it is also called heaven, is not that heaven in which there are stars, but this lower heaven by the smoke of which the clouds are globulated, and where the birds fly”. ST. AUGUSTINE, *Concerning the Nature of Good*, [in:] Phillip Shaff (ed.) *Nicene and Post-Nicene Fathers: First Series, Volume IV, St. Augustine*, New York 2007: 358.

The description of the music of the spheres that we find in Honorius' works is expanded by new elements in relation to Boethius' theory. In *De imagine* there are also new justifications given to the problems that had been discussed earlier. The order of the planets that we find in Honorius is identical to that known from Boethius' work and is a reflection of the model widely accepted in the twelfth century.

The planets, as they move, produce a sweet sound which remains unperceived by our imperfect sense of hearing. This argument of the limitations of our sensory perception had been used before to justify the fact that we were unable to hear the music of the spheres. Honorius gave yet another reason—man can only hear sounds produced in the air whereas the sounds of the harmony of the spheres are not produced in the air, which only fills the space below the sphere of the Moon. This is the reason why the sound cannot be heard by us although it resounds in the entire universe.¹⁶ This argumentation is a logical result of Honorius' other premises—in *Elucidarium* he states clearly that hearing draws its ability from the air that surrounds us. This solution to the problem is the first which does not blame human imperfection but points to the physical circumstances of the origin of sound.¹⁷

The spaces between the planets can be interpreted as being reflected in the musical intervals. This is the way this model is represented in Honorius' writings:¹⁸



¹⁶ "Hi septem orbes cum dulcisona harmonia volvuntur, ac suavissimi concentus eorum circuituone efficiuntur. Qui sonus ideo ad nostras aures non pervenit, quia ultra aerem fit, et ejus magnitudo nostrum angustum auditum excedit. Nullus enim sonus a nobis percipitur, nisi qui in hoc aere efficitur. A terra autem usque ad firmamentum coelestis musica mensuratur, ad cujus exemplum nostra inventa affirmat". HONORIUS AUGUSTODUNENSIS, *De Imagine...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 140.

¹⁷ This explanation is compliant with Aristotle's thesis, which criticised the Pythagorean concept of the harmony of the spheres in *De caelo*. Arystoteles [Aristotle], *O niebie* [On Heaven], transl. P. Siwek, [in:] *Arystoteles, Dzieła wszystkie* [Aristotle, Collected Works], Vol. II, Warszawa 1990: 287–289.

¹⁸ "A terra usque ad lunam est tonus, a luna usque ad Mercurium, semitonium; a Mercurio usque ad Venerem, semitonium; inde usque ad solem, tria semitonia. A sole ad Martem tonus, inde ad Jovem, semitonium; inde ad Saturnum semitonium; inde ad signiferum tria semitonia. Quae simul juncta septem tonos efficiunt". HONORIUS AUGUSTODUNENSIS, *De Imagine...*, J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 140.

The model is almost identical to the one found in *De nuptiis* by Martianus Capella, with the small, though essential, difference in the distance between the Sun and Mars: a semitone in Martian's theory and whole tone in Honorius'. Altogether the distances quoted by Honorius produce seven whole tones.¹⁹ As we well know otherwise, this number was assigned special properties.

According to Honorius, *Musica humana* is a reflection of the music of the spheres—this is how the next fragment of this work should be understood. Although Honorius does not use the same terminology as Boethius, the sense of his words is very clear and is entirely in accordance with the distinctions made by Severinus. Music of human nature is a consequence of the harmony between the four elements and the powers of the soul. On this view man can be called a microcosmos, not only because of his physical complexity (being compounded of four elements) but also because the music of the spheres is reflected in him.²⁰

The School of Chartres was, without a doubt, a very important centre for popularizing Boethius' ideas. According to F. Copleston it was one of the most well-developed and interesting schools of the twelfth century.²¹ Among its more eminent representatives are Bernard of Chartres (d. after 1124), Gilbert de la Porée (1076–1154), Thierry of Chartres (d. c. 1150), William of Conches (approx. 1080–1154), John of Salisbury (d. 1180), who was connected with the school, and the philosopher and poet Alain de Lille (before 1128–1202). The School of Chartres had much older traditions, although it only fully flourished in the twelfth century. It was founded by Fulbert, the pupil of Gerbert

¹⁹ There are certain inconsistencies in S. Swieżawski's *Dzieje...* (2000). On page 470, where the author discusses Honorius' cosmological model, he says that there is a distance of a semitone between the Sun and Mars, which is inconsistent with the text of *De imagine mundi*. The sum of tones quoted by S. Swieżawski is seven so it is probably just a typographic mistake. It is not true however, as Swieżawski says, that Honorius created a prototype of our octave when he described the musical distances between the spheres. However Honorius is not the first author who did that and what's more seven full tones do not add up to an octave but to nona.

²⁰ "Sicut enim hic mundus septem tonis, et nostra musica septem uocibus distinguitur, sic compago nostri corporis septem modis coniungitur, dum corpus quatuor elementis, anima tribus uiribus copulatur, quae Musica arte naturaliter reconciliatur. Unde et homo *μικροκόσμος*, id est minor mundus dicitur, dum sic consono numero coelesti musicae par cognoscitur". Honorius AUGUSTODUNENSIS, *De Imagine...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 140.

²¹ F. COPLESTON, *Historia Filozofii* [History of Philosophy], Vol. II, transl. S. Zalewski, Warszawa 2004: 158.

of Aurillac as early as 990²² and since from the very beginnings of its existence its main feature was an emphasis on natural sciences, including medicine, which was directly linked with the interests of its founder. This is what Stefan Swieżawski says about the school:

(...) a characteristic feature of the School of Chartres was the cult of classicism, studying the authors of antiquity and cultivating Latin. This was all linked with great respect for ancient philosophical thought, especially for Aristotle (the *logica nova* was cultivated). It manifested itself in the love of deductive thinking; the impact of Aristotelian physics was also considerable (especially on *Liber sex principiorum* attributed to Gilbert de la Porée). Another important authority for the scholars of Chartres was Boethius and his writings on the topic of the *quadrivium*, above all *De musica* and *De arithmetica*, and also *De Trinitate*. Yet unquestionably the strongest was the impact of Plato's thought, as it was the first time in the Middle Ages that inspiration was drawn from the original Platonian texts (the only direct source was *Timaeus*, from which the extreme conceptual realism was adopted). In fact Chartres was the mainstay of Plato's thought in the Middle Ages.²³

The scholars gathered around the School of Chartres created the first academic centre to systematically study the work of Boethius. Their cosmological concepts were mostly developed on the basis of Plato's thought (i.e. *Timaeus*), so they knew the commentaries that Calcidius attached to his translation. They also knew Macrobius' *Commentary*.

Unfortunately, we cannot tell to what extent the cosmological motifs, inspired by the *musica mundana* theory, were present in the teachings of Bernard of Chartres as probably none of his writings survived.²⁴ Any knowledge we have today about Bernard's views came from the writings of John of Salisbury, especially the *Metalogicon*.²⁵ Also there are no discrepancies with the prevailing concept of *musica mundana* in the writings of Gilbert de la Porée, whereas the lecture by Thierry of Chartres was mostly based on *Timaeus*, being its interpretation and expansion in the Christian spirit, which is to a large extent

²² F. COPLESTON, *Historia...* (2004): 159.

²³ S. SWIEŻAWSKI, *Dzieje...* (2000): 486.

²⁴ It is true that Paul E. Dutton published a critical issue of *Glosae super Platonem*, which he attributed to Bernard (see. P. E. Dutton, *Glosae super Platonem*, Toronto, 1991). However this attribution is not unanimously accepted in medievalist circles. It is for example rejected by Sten Ebbesen. See: S. EBBSSEN, *Glosae super Platonem. by Bernard of Chartres; Paul Edward Dutton*, reviewed [in:] *Speculum*, Vol. 71, No 1, 1996: 123–125.

²⁵ JOHN OF SALISBURY, *Metalogicon*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CXCIX, coll. 823–946.

what Honorius Augustodunensis set out to do. Thierry of Chartres described the distribution of the elements in the universe and the arrangement of the spheres in a similar way.²⁶ Although in Thierry's teachings we also find some Aristotelian elements, e.g. he distinguished four kinds of causes in the world: formal, material, efficient and final.²⁷ What we can actually observe in many authors of the time is the increasingly uncertain status of music among the other mathematical disciplines. Thierry of Chartres, for example, argued that music was one of the epistemological routes that could lead man to the knowledge of the Creator²⁸—so the epistemological status of music did not raise any doubts. For Thierry, and as one might expect for other Chartres scholars, the place of music in the system of sciences was not a disputable issue. Perhaps this is because the reflection on music itself, although part of Chartres scholars' inquiry, was not at the centre of their interest. This allowed them to see music from a more traditional perspective. A certain conservative approach of the philosophical circles, including the Chartres scholars, was the result of their own readings. The place of music was after all clearly defined in the views of Macrobius, Calcidius, Boethius and Plato himself.

The rationalism of the Chartrian discourse can be fully admired in *De philosophia mundi* by William of Conches,²⁹ which was violently attacked by William of St. Thierry, who accused the author of relying too much on reason

²⁶ See: A. C. CROMBIE, *Medieval and Early Modern Science*, Harvard 1967, Vol. I: 179.

²⁷ "Istnieją cztery przyczyny świata [*substantia mundana*]: sprawcza, czyli Bóg; formalna, czyli Mądrość Boża; celowa—Jego łaskawość i materialna—cztery elementy" [There are four causes of the world (*substantia mundana*): efficient which is God, formal which Divine Wisdom; final which is God's generosity and material which is the four elements]. TEODORYK z CHARTRES [Thierry of Chartres], *Traktat o dziełach sześciu dni* [Treatise on the Works of the Six Days], transl. S. Bafia, Kraków 2006: 75.

²⁸ "Istnieją więc cztery rodzaje dowodów, arytmetyczne, muzyczne, geometryczne i astronomiczne które wiodą człowieka do poznania Stwórcy. Tymi narzędziami w tejże teologii krótko należy się posługiwać, aby ukazywać zarówno działanie Stwórcy w rzeczach, jak i—co przedstawiamy—racjonalnie dowodzić". [There are four types of proofs: arithmetic, musical, geometric and astronomical, which guide man to the knowledge of the Creator. These tools in that theology should be used briefly to reveal God's action in things, and also—as we present it here—to reason rationally] [in:] TEODORYK z CHARTRES [Thierry of Chartres], *Traktat...* (2006): 107.

²⁹ William is also the author of *Περὶ διδασκῶν sive Elementorum Philosophiae Libri Quatuor*, which was published in the series J. P. Migne, *Patrologiae...* (1857–1866), Vol. XC, coll. 1127–1178 under the name of the Venerable Bede, whereas *De philosophia mundi* was attributed in the same series to Honorius Augustodunensis, J. P. Migne, *Patrologiae...* (1857–1866), Vol. CLXXII, coll. 39–102.

and too little on the basic principles of faith. This is an interesting testimony to how heated mediaeval disputes were, and that the choice of words left much to be desired. William of St. Thierry attacked the Chartres philosopher, saying that even if he dared confirm some of Abelard's thesis his own ideas that he shamelessly added were simply wretched.³⁰ Philosophy, as defined by William of Conches, was a true understanding of what existed and was invisible (incorporeal beings) and existed and was visible (corporeal beings).³¹ Corporeal beings consisted of the elements, which were defined as the smallest (in size), indivisible (in quality) parts of a body.³² Earth was thought to be the heaviest of the elements, occupying the central place in a universe whose arrangement was egg-shaped. The position of the Earth was compared to a yoke in the egg, surrounded by water (egg white); with air hanging above them like an egg membrane, and then on the very top was the fire that enclosed it all like an egg-shell.³³

One might expect that in Chartrian philosophy the Boethian concept of the music of the spheres would play a greater role but, as we can clearly see, it was rather weakly represented in this school of thought. The Chartrians develop their cosmological thought based directly on *Timaeus*; their studies of Boethius' thought are indeed one of the most important trends in the

³⁰ Further to the dispute between St. Bernard of Clairvaux and Abelard, William of St. Thierry wrote to St. Bernard of Clairvaux and in his letter he criticised William of Conches. He compared the Charterian scholar to Abelard and both were quoted as the antithesis of the way philosophy should be cultivated: "Ecce enim de radice colubri ascendit regulus, obscuri quidem nominis, et nullis auctoritatis; sed tamen veneo pestifero ipsum aerem communem corrumpens. Etenim post theologiam Petri Abelardi, Guillelmus de Conchis novam affert philosophiam, confirmans et multiplicans quaecumque ille dixit, et impudentius addens adhuc de suo plurima, quae ille non dixit. Cujus novitatum vanitates". WILLIAM OF ST. THIERRY, *De Erroribus Guillelmi De Conchis Ad Sanctum Bernardum*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CLXXX, col. 333.

³¹ „Philosophia est eorum quae sunt et non videntur et eorum quae sunt et videntur vera comprehensio". WILLIAM OF CONCHES, *De Philosophia Mundi...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CLXXII, col. 43.

³² "Elementum ergo (...) est simpla et minima pars alicujus corporis: simpla ad qualitatem, minima ad quantitatem (...)", WILLIAM OF CONCHES, *De Philosophia Mundi...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866): Vol. CLXXX. col. 48.

³³ "Est ergo terra elementum in medio mundi situm, atque ideo infimum. Mundus nempe ad similitudinem ovi est dispositus. Namque terra est in medio, ut vitellus in ovo. Circa hanc est aqua, ut circa vitellum albumen. Circa aquam est aer, ut penniculus continens albumen. Extra vero concludens omnia, est ignis ad modum testae ovi". WILLIAM OF CONCHES, *De Philosophia Mundi...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866): Vol. CLXXX, col. 85.

Chartres School, but they use theological treatises and Boethius' works in logic, which—together with Aristotle's writing—comprise the *logica vetus*. A. Kijewska writes about the diminishing role of music (even in the most traditionalist philosophical circles) among the other liberal arts:

Among the *quadrivium* arts, music is definitely least represented. It is discussed here (in the Chartres School) on the basis of Boethius' handbook. In the twelfth century a division into theory and practice was applied to the quadrivium arts. In relation to music, this division had been used much earlier: a musician is both a theorist of music and a singer. In the twelfth century music lost its purely mathematical orientation and was much more strongly attached to practice. Its presence within the *quadrivium* was a consequence of the importance that the Platonian texts had ascribed to it. Its special significance and autonomy among other disciplines was confirmed by the fact that singing practice was removed from the general curriculum in the cathedral schools and transferred to the care of a special master.³⁴

Kijewska's comments are even more interesting in that she assumes the diminishing role of mathematical orientation in the theory of music of the period discussed here. E. Witkowska-Zaremba, however, concludes that mathematical orientation began to dominate in the late Middle Ages, especially in university circles.³⁵ These two positions, seemingly contradictory, can be reconciled. The differences in the evaluations by the two researchers are a result of different methodologies they have adopted and, more than that, of the fact that in principle they describe the same phenomenon from different perspectives. E. Witkowska-Zaremba's starting point is the theory of music whereas for A. Kijewska it is history of philosophy. The divisions of trends within the medieval reflection on music, made by the two authors, are largely the same. Any misunderstandings are a result of the terminology they use. A. Kijewska uses the term "mathematical" orientation to mean theoretical speculations regarding the nature of music, as opposed to more practical considerations. The same "mathematical" orientation corresponds to the cosmological trend in E. Witkowska-Zaremba's typology and practical considerations refer to the "mathematical trend". Let us note here that although one might question

³⁴ A. KIJEWSKA, *Księga Pisma i Księga Natury, Heksameron Eriugeny i Teodoryka z Chartres* [The Book of Writing and the Book of Nature, the 'Hexameron' by Eriugena and Thierry of Chartres], Lublin 1999: 179.

³⁵ E. WITKOWSKA-ZAREMBA, *Musica Muris i nurt spekulatywny w muzykografii średniowiecznej*, [Musica Muris and Speculative Trend in Medieval Musicography], [in:] *Studia Copernicana*, Vol. XXXII, Warszawa 1992: 21.

E. Witkowska-Zaremba's division, it seems that it reflects the specific character of medieval musicography more adequately.³⁶ A. Kijewska seems to have missed the fact that the medieval authors' perception of music as a mathematical discipline produced the effect of applying a conceptual framework drawn from mathematics (or, less anachronously, arithmetic) to this field. In early cosmological deliberation in the Pythagorean style, their "mathematisation" is essentially reduced to basic calculations of musical scale and the idea of "a number" has much more of a mythicizing than arithmetical dimension. In the late Middle Ages, even the most practice-oriented theoretical treatises often described musical phenomena by referring to mathematical concepts.

Another important twelfth century centre of learning, apart from the Chartres School, was the School of St. Victor. E. Gilson thinks of it as the second centre, after to Clairvaux, dominated by so-called speculative mysticism.³⁷ In the School of St. Victor, a great deal of emphasis was placed not only on theological speculation but also on teaching the liberal arts, certainly under the influence of perhaps its most distinguished thinker, Hugh of St. Victor. Situated in the suburbs of Paris, the St. Victor Augustinian priory of canon regulars and the school it ran were mostly famous owing to Hugh of St. Victor and Richard of St. Victor.³⁸ The first signs of intellectual revival in the school were connected with the arrival of William of Champeaux who sought shelter there against his opponent, Ablerd.³⁹ The Victorine formation found its continuation in the Franciscan school, especially in the thought of Saint Bonaventure.⁴⁰ Hugh of St. Victor, who came from Saxony, was born to a noble family in 1096. In 1115 he came to St. Victor priory, which he was in charge of from 1133 until his death in 1141.⁴¹ Hugh played a vital role and enjoyed huge recognition among many scholastic thinkers. Saint Bonaventure, in *De reductione artium ad theologiam*, says that the teaching of faith was best captured by St. Augustine, ethics

³⁶ A. Kijewska clearly associates the "mathematical" orientation with highly abstract considerations, not at all related to practice, which leads her to reaching the conclusion, which is not entirely justified, that these considerations are necessarily devoted to cosmological speculations.

³⁷ E. GILSON, *Historia filozofii chrześcijańskiej w wiekach średnich* [History of Christian Philosophy in the Middle Ages], transl. S. Zalewski, Warszawa 1987: 157.

³⁸ F. COPLESTON, *Historia...*, Vol. 2 (2004): 164.

³⁹ S. SWIEŻAWSKI, *Dzieje...* (2000): 520.

⁴⁰ R. HEINZMANN, *Filozofia średniowiecza* [Philosophy of the Middle Ages], transl. P. Domański, Kęty 1999: 183.

⁴¹ F. COPLESTON, *Historia...*, Vol. 2 (2004): 164.

by St. Anselm, St. Gregory the Great and St. Bernard, mysticism by Pseudo-Dionysius the Areopagite and Richard of St. Victor, and that Hugh gave the best lecture of them all.⁴²

Hugh of St. Victor left many works behind, *Didascalion* being of most interest to us. It is, however, worth noting that the famous Papal Bull *Unam Sanctam*⁴³ of Boniface VIII was based on the ecclesiology of Hugh's *De sacramentis christianae fidei*.⁴⁴ *Didascalion* is a treatise consisting of seven books presenting an introduction to sciences and their theory. The systematization of sciences made by Hugh is essential to later intellectual developments. To this author science was a very important element of human endeavour leading to salvation, because knowledge mended the fallen human nature. Finding wisdom meant finding happiness, and acquiring it stood for finding salvation.⁴⁵ Philosophy was divided into four sections: theoretical and practical, mechanics and logic. Theoretical (speculative) science included theology, mathematics and physics; ethics was practical. Mechanics comprised seven sciences or crafts⁴⁶ and logic included grammar and the art of discussion.⁴⁷ Details of Hugh's division are as follows:

⁴² S. SWIEŻAWSKI, *Dzieje...* (2000): 529.

⁴³ The Papal bull *Unam Sanctam* issued by Pope Boniface VIII is the fullest expression of the position of papal theologians in the famous dispute for the leadership in the Christian world. Egidius Romanus (Giles of Rome), who was a pupil of St. Thomas Aquinas and the author of *De ecclesiastica potestate*, is considered its main author. The theory exposed in the bull was thoroughly criticised by Dante in his excellent treatise *De Monarchia*, which was itself soon refuted (by, among others, Guido Vernani—a Dominican and the author of the treatise *De reprobatione Monarchiae*), then condemned by Pope John XXII and finally placed on the *List of Prohibited Books*. The *Unam Sanctam* bull ends on a characteristic note: "Furthermore, we declare, we proclaim, we define that it is absolutely necessary for salvation that every human creature be subject to the Roman Pontiff". BONIFACE VIII, *Bulla Unam Sanctam* [in:] Dante Alighieri, *Monarchia*, transl. W. Seńko, Kęty 2002: 100.

⁴⁴ These are notes of the lectures of Hugh of St. Victor made by his pupil, Laurentius. What's important is that the notes were reviewed by Hugh of St. Victor himself. S. Swieżawski, *Dzieje...* (2000): 520–521.

⁴⁵ "Reparatur autem per doctrinam, ut nostram agnoscamus naturam, et ut discamus extra non quaerere, quod in nobis possumus invenire. Summum igitur in vita solamen est studium sapientiae, quam qui invenit felix est, et qui possidet, beatus". HUGH OF ST. VICTOR, *Eruditionis Didascalicae Libri Septem*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CDXXVI, col. 742.

⁴⁶ S. Swieżawski claims that there are eight but he is wrong. S. Swieżawski, *Dzieje...* (2000): 523.

⁴⁷ "Philosophia dividitur in theoreticam, practicam, mechanicam et logicam. Hae quatuor omnem continent scientiam. Theorica interpretatur *speculativa*; practica *activa*, quam alio nomine ethicam, id est moralem dicunt, eo quod mores in bona actione consistant; mechanica,

Philosophy

- | | |
|---|--|
| <p>1) Theoretical</p> <ul style="list-style-type: none"> a) theology b) physics c) mathematics <ul style="list-style-type: none"> – arithmetic – geometry – astronomy – music <p>2) Practical</p> <ul style="list-style-type: none"> a) individual ethics b) domestic ethics c) political ethics | <p>3) Mechanics</p> <ul style="list-style-type: none"> a) weaving b) handicraft c) navigation d) agriculture e) hunting f) medicine g) theatre <p>4) Logic</p> <ul style="list-style-type: none"> a) grammar b) argument <ul style="list-style-type: none"> – probable argument – rhetoric – dialectics |
|---|--|

In Hugh’s classification the liberal arts do not exhaust the *universum* of sciences, but their study is indispensable in acquiring knowledge. This division follows Boethius’, which Hugh admitted himself. Music was not a part of physics, as indicated by Aurelian of Réôme, but was traditionally classified as one of the mathematical disciplines.

In fact *Didascalion* is full of references to Boethius—the impact of that thinker on Hugh’s system is truly remarkable. Particularly important is the fact that Hugh entirely accepted the Boethian trisection of music and, what followed, the Boethian cosmology. In the part of *Didascalion* devoted to mathematical sciences⁴⁸ Hugh wrote that the term ‘music’ came from the word ‘wa-

adulterina, quia circa humana opera versatur; logica, *sermotionalis*, quia de vocibus tractat. Theorica dividitur in theologiam, mathematicam et physicam. Hanc divisionem Boethius facit aliis verbis: Theoricen secans in intellectibilem, et in intelligibilem, et naturalem: per intellectibilem significans theologiam; per intelligibilem, mathematicam; per naturalem physicam”. Hugh of St. Victor, *Eruditionis...*, [in:] J. P. Migne, *Patrologiae...* (1857–1866), Vol. CDXXVI, col. 752.

⁴⁸ Hugh clearly distinguishes astronomy, as a dependable science, from astrology, which he divides into two types: *naturalis* and *superstitiosa*. The first is more worthy of our attention and its subject matter is health sickness and the bodily complexion within the context of the theory of the four elements. The second type of astrology is undeserving of any serious study: “Astronomia et astrologia in hoc differre videntur, quod astronomia de lege astrorum nomen sumpsit, astrologia autem dicta est quasi sermo de astris disserens. *Νομος* enim *lex* et *λογος* *sermo* interpretatur. Ita astronomia videtur esse quae de lege astrorum et conversione caeli disserit, regiones, circulos, cursus, ortus et occasus siderum, et cur unumquodque ita vocetur, investigans. Astrologia autem quae astra considerat secundum nativitatis et mortis et quorumlibet aliorum eventuum observationem quae partim naturalis est, partim superstitiosa. Naturalis in

ter' because no sound was possible without humidity.⁴⁹ Following Boethius, he divided music into three main types and, further, into more subdivisions expanded with biblical motifs. On this view *Musica mundana* was understood as being all about the harmony of the planets, elements and time; the harmony of elements as realized in a number, measurement or weight and the harmony of the spheres in their position, movements and nature. The harmony of time was meant to be inherent in the succession of days and nights, months, years and seasons of the year. *Musica humana* was about the harmony in the body, soul and their connection; the harmony of the body lay in vitality, balanced bodily fluids and the capacity to act. Music rose in the soul out of virtues, such as justice, temperance and piety, and the three powers of the soul. The music between the body and the soul was a result of their natural friendship; one must not think of the body as the prison of the soul or hold it in contempt. The division of *musica instrumentalis* was slightly different than in Boethius' text. Hugh distinguished vocal music as a new type. *Musica instrumentalis* was made *in flatu* (by brass instruments), *in pulsu* (by percussion and string instruments) and *in voce* (by singing). Hugh did not agree with Boethius on the issue of who could be regarded as a musician. His text was a reflection of the existing state of affairs, i.e. a growing significance of musical practice. Hugh said that three types of people could be distinguished as musicians: singers, instrumentalists and those capable of passing a rational judgment on singing and instrument playing i.e. theorists.⁵⁰

complexionibus corporum, quae secundum superiorum contemperantiam variantur, ut sanitas, aegritudo, tempestas, serenitas, fertilitas et sterilitas. Superstitiosa, in contingentibus et in iis, quae libero arbitrio subjacent; quam partem mathematici tractant". HUGH OF ST. VICTOR, *Eruditionis...*, [in:] J. P. MIGNE, *Patrologiae...* (1857–1866), Vol. CDXXVI, col. 756.

⁴⁹ "Musica a moy, id est ab aqua vocabulum sumpsit, eo quod nulla euphonia, id est, *bona sonoritas*: sine humore fieri potest". HUGH OF ST. VICTOR, *Eruditionis...*, [in:] J. P. Migne, *Patrologiae...* (1857–1866), Vol. CDXXVI, col. 755.

⁵⁰ "Tres sunt musicae: mundana, humana, instrumentalis. Mundana, alia in elementis, alia in planetis, alia in temporibus. Quae in elementis: alia in numero, alia in pondere, alia in mensura. Quae in planetis: alia in situ, alia in motu, alia in natura. Quae in temporibus; alia in diebus, vicissitudine lucis et noctis, alia in mensibus, crementis detrimentisque lunaribus, alia in annis, mutatione veris, aestatis, autumnii, hiemis. Humana musica: alia in corpore, alia in anima, alia in connexu utriusque. Quae in corpore: alia est in vegetatione, secundum quam crescit quae omnibus nascentibus convenit. Alia est in humoribus: ex quorum complexione humanum corpus subsistit. Quae sensibilibus communis est, alia in operationibus; quae specialiter rationalibus congruit, quibus mechanica praestet; quae si modum non excesserint bonae sunt, ut inde non nutriatur cupiditas: unde infirmitas foveri debet, sicut Lucanus in laudem Catonis refert. *Huic*

The concept of *musica mundana* was not only well-known but also accepted and developed in the St. Victor School, as is testified by Hugh's writings and those of Richard of St. Victor. Among his works, there is *Liber exceptionum*, an extract from *Didascalion* in which Boethius' theory is simply reiterated again. In fact, Severinus Boethius is one of the most quoted authors by the Victorine writers. In *Fons philosophiae* by Godfrey of St. Victor, which is an attempt at the classification of the sciences and listing of older philosophical sources, Boethius' name is mentioned next to Plato, Aristotle, Martianus Capella and Macrobius.⁵¹ In this work, Godfrey also mentions the notion of the music of the spheres.⁵²

Boethius' theory, so alive in the philosophers' works, is also represented in twelfth century musicography, although in most of the treatises the concept is merely mentioned or even omitted, especially from the writings on polyphonic music whose authors are hardly interested in cosmological considerations. Other treatises of the time, although their authors undoubtedly knew Boethius well, introduced original, entirely new thoughts and new classifications of music. We shall now discuss the works by the twelfth century theorists and philosophers which are important from the point of view of the reception of Boethius' theory.

Frutolf of Michelsberg (mid-eleventh c. –1103) was a theorist and compiler in the Benedictine Abbey in Michelsberg, Bamberg. Among his works there is the *Chronicle of the World* (*Chronica*), and his theoretical writings about music

*epulae vicisse famem, magnique penates Submovisse hiemem tecto: pretiosaque vestis Hirtam membra super, Romani more Quiritis, Induxisse togam, etc, Musica in anima, alia est in virtutibus, ut est iustitia, pietas et temperantia; alia in potentiis, ut est ratio, ira et concupiscentia. Musica inter corpus et animam: est illa naturalis amicitia qua anima corpori non corporeis vinculis, sed affectibus quibusdam colligatur ad movendum et sensificandum ipsum corpus, secundum quam amicitiam nemo carnem suam odio habuit. Musica haec est, ut ametur caro, sed plus [spiritus], ut foveatur, corpus, non perimatur virtus. Musica instrumentalis: alia in pulsu, ut fit in tympanis et chordis; alia in flatu, ut in tibiis et organis; alia in voce, ut in carminibus et cantilenis. Tria quoque sunt genera musicorum: unum quod carmina fingit, aliud quod instrumentis agit, tertium quod instrumentorum opus carmenque diiudicat". HUGH OF ST. VICTOR, *Eruditionis...*, [in:] J. P. MIGNÉ, *Patrologiae...* (1857–1866), Vol. CDXXVI, coll. 756–757.*

⁵¹ S. SWIEŻAWSKI, *Dzieje...* (2000): 532. Also: E. WHITNEY, *Paradise restored. The Mechanical Arts from Antiquity through the Thirteenth Century*, Philadelphia 1990.

⁵² "Calculosus etiam, sed magis profundus, Cum canoro strepitu labitur secundus, Gustu delectabilis, murmure jocundus, Armoniam resonat qualem sonat mundus". GODFREY OF ST. VICTOR, *Fons philosophiae*, [in:] *Fons philosophiae: počme inédit du XIIIe siècle*, A. Charma (ed.), Caen 1868.

include *Breviarium*, *Rythmimachia* and *De divinis officiis*.⁵³ These works are more than anything practical in character, in the sense that they discuss issues relating to choral singing. Frutolf drew his ideas from Boethius, Regino of Prüm, Hermann of Reichenau, Henry of Augsburg and Guido of Arezzo. Although he did not refer directly to the theory of *musica mundana*, certain fragments of his treatises make us think that he did accept Boethius' views in this respect. In *Breviarium* he says that music naturally "belongs" to man, as philosophers assert, because the combination of soul and body is of harmonious proportions.⁵⁴ In *Rythmimachia*, however, there is a short fragment devoted to the concept of the harmony of the spheres. The Creator made everything according to numerical proportions, which is why, as the Bible says, the world is made out to measure, in terms of numbers and weight. This is exactly what Boethius says, quoting the harmony of the human soul as the best example, but also including a balance of the elements, times and the movement of celestial objects.⁵⁵ So it seems that Frutolf accepted Boethius' theory in its entirety although he did not use the terminology of the *De institutione*. This type of reception of Boethius' thought, granting it is somewhat limited, is characteristic of the theorists of the period discussed. In principle, they accepted the assumptions of the Pythagorean cosmology in Boethius' version but they failed to develop it any further, and in spite of many ideas borrowed from *De institutione musica* they rarely named the phenomenon of the music of the spheres using Boethian concepts.

Rudolf of Sint Truiden, who lived in 1070–1138 (in Limburg in eastern Belgium), was a Benedictine abbot. He is the author of a chronicle of the abbots of Sint Truiden, entitled *Gesta Abbatum Trudonensium*. His treatise *Quaestiones*

⁵³ M. HUGLO, *Frutolfus of Michelsberg*, [in:] *The New Grove Dictionary of Music and Musicians*, S. Sadie (ed.), London-New York 2002, Vol. IX.

⁵⁴ "Musicam vero naturaliter homini inesse philosophorum testatur auctoritas qui dicunt omnes animae nostrae corporisque compagines musica coaptatione esse conjunctas et harmonice modulationis proportionibus quodammodo compositas". FRUTOLF OF MICHELBERG, *Breviarium de musica*, [in:] *Frutolfi Breviarium de musica et Tonarius*, C. Vivell (ed.), *Akademie der Wissenschaften in Wien, Philosophisch-historische Klasse, Sitzungsberichte*, Vol. CLXXXVIII, No. 2, Vienna 1919: 26–27.

⁵⁵ "Siquidem numerum natura dedit, quo et ipse naturae conditor deus in rerum creatione usus est; de quo dicitur quia omnia in mensura et numero et pondere constituisti. Hoc enim, ut ait Boethius, principale in animo conditoris exemplar fuit. Hinc enim quatuor elementorum multitudo mutuata est, hinc temporum uices, hinc motus astrorum caelique conuersio". FRUTOLF OF MICHELBERG, *Rythmimachia*, [in:] *Frutolfi Rythmimachia, Abhandlungen zur Geschichte der Mathematik*, Vol. III, Leipzig 1880: 169.

in musica is another example of a typical twelfth century reception of Boethius' cosmological views, exposed in *De institutione musica*. Talking of the hierarchy of numbers, Rudolf asserted that three was the main number, because we could separate three kinds of music, which he proceeded to name after Boethius. Three was also linked with the musical harmony which soothed the motions of the soul, chased demons away and the connection of soul with body. Also, the music of the spheres was one of the types of musical harmony;⁵⁶ but this was where the cosmological discussion ended, and the rest of the treatise is devoted to musical practice. Interestingly, Rudolf did not discuss the issue of *quid sit musicus* as he would have to give a different answer to the question posed in this way than that given by Boethius.

Dominicus Gundissalinus, also known as Domingo Gundisalvo (flourished ca. 1150), who wrote mostly in the second half of the twelfth century,⁵⁷ is best known for his translation of the works of the Arab scientists, mostly Avicenna, Al-Ghazâlî and ibn Gabriol. He is also attributed with the translation of some of the writings of Al-Farabi.⁵⁸ Gundissalinus is the author of one of the most popular contemporary classifications of the sciences, based largely on the Arab texts, mostly those by Al-Farabi. His division of sciences is different from that made by Hugh of St. Victor, whose classification was most of all based on Latin sources. For Gundissalinus, Boethius' works were among the most important sources, next to the Bible and the Muslim authors he had translated.⁵⁹

⁵⁶ "Primus ergo omnium numerorum est ternarius, cui inter duo summa medium, quo vincitur, accidit. Quaternarius vero, qui duas medietates obtinuit et quia tunc artius extrema vincuntur, quando medietas geminatur, merito artifex natura iussu creatoris hunc sibi numerum ascivit, quo insolubili colligationis vinculo elementa sibi repugnancia devinxisset triaque illa musicae genera id est mundanae, humanae et eius, quae est in instrumentis, rata modulationis lege conformasset. Merito, inquam, hic numerus musicae armoniae est attributus, qui inferiora superioribus conciliat, animae corporisque statum iugabili proportionum competentia federat, bestiales hominum modus comprimit, mores componit, iras daemonum mitigat vel potius fugat, etiam ipsam terram sonorum suorum concentibus caelo quodammodo associat". RUDOLF OF SAINT TRUIDEN, *Quaestiones in musica* [in:] *Die Quaestiones in musica: Ein Choraltraktat des zentralen Mittelalters und ihr mutmasslicher Verfasser Rudolf von St. Trond (1070–1138)*, R. Steglich (ed.), Leipzig 1911: 27–28.

⁵⁷ See: E. GILSON, *History...* (1987): 597.

⁵⁸ Dominicus used Al-Farabi's *De scientiis* in his *De divisione philosophiae*.

⁵⁹ A. Crombie says that Gundissalinus did not translate directly from the Arabic language but from Castillian into Latin. His translations were made with the help of the Spanish Jew John of Seville, who translated from Arabic into Castillian. A. C. CROMBIE, *Nauka...*, Vol. 1 (1960): 55.

Boethius' impact was also visible in Dominic's use of the conceptual framework set out by the author of *De consolatioe*.⁶⁰ This is what A. Crombie says about the classification of the sciences made by Gundissalinus:

Later in the twelfth century another popular classification of the sciences was written by Dominicus Gundissalinus, his *De divisione philosophiae* (...) Gundissalinus, following another form of the Aristotelian tradition, classified the sciences into theoretical and practical. He subdivided the former into physics, mathematics and metaphysics and the latter into politics, or the art of civil government, the art of family government, which included giving instructions liberal and mechanical arts and ethics or the art of self-government. The 'fabrile' or 'mechanical' arts were those concerned with making out of matter something useful to man, and the matter used could come either from living things, for example wood, wool, linen or bones or from dead things, for example gold, silver, led, iron or precious stones. Through the mechanical arts resources were acquired which provided for the needs of the family. To each of the mechanical arts there corresponded a theoretical science which studied the basic principles which the mechanical art put into practice. Thus theoretical arithmetic studied the basic principles of numbers used in reckoning by the abacus, as in commerce; theoretical music studied in abstract the harmonies produced by voices and instruments, theoretical geometry considered the basic principles put into practice in measuring bodies, in surveying and in using the results of observing the motions of the heavenly bodies with the astrolabe and other astronomical instruments; the science of weights considered the basic principles of weight and levers. Finally the science of 'mathematical inventions' which turns the results achieved by all other mathematical sciences towards useful purposes, such as masonry, musical and optical instruments and for carpentry.⁶¹

Gundissalinus' classification was another step in adjusting the theory of the sciences to the actual state of affairs, which was particularly clear in case of music, its theory being separated from other sciences and still mostly focused on musical practice.

In fact Dominicus Gundissalinus devoted the entire of Book X of *De divisione philosophiae* to music. Music meant fluency in modulating ("shaping") sound and the vocal. Gundissalinus distinguished two types of musical "tones": sound (*sonus*), which was everything that could be perceived by our auditory system and voice (*vox*), which originated in the throat and was produced both by humans and animals. Singing was a type of voice. The Augustinian notion *modulatio* (which probably originated with Censorinus) was defined as a har-

⁶⁰ A. FIDORA, *Die Wissenschaftstheorie des Dominicus Gundissalinus: Voraussetzungen und Konsequenzen des zweiten Anfangs der aristotelischen Philosophie im 12. Jahrhundert*, Berlin 2003: 37.

⁶¹ A. C. CROMBIE, *Medieval...*, Vol. 1 (1967): 179.

monious blend of opposing things. Such understanding of this term was an interpretation in relation to the range of meaning attributed to it in Augustine's *De Musica*, where *modulatio* had meant the art of proper formation, guiding movement to the desired shape. This referred not only to music but to other associated areas, such as the art of oration. Gundissalinus took *modulatio* to be a much broader concept, quite reminiscent of the Pythagorean notion of "harmonia". *Modulatio* was also a difference (*differentia specifica*) which helped us distinguish music from other sciences. The genre to all of them was "expertise" (*peritia*). Such explication of the concept of *modulatio* let Gundissalinus use this term to define the three types of music i.e. the concordant, harmonious combinations of opposites. The types of music he distinguished were: *musica mundana*, the combination of elements in the destructible world, *musica humana* in man's corporeal form and *musica instrumentalis* in the musical harmony perceptible by the senses.⁶²

Music was divided into theoretical and practical. The latter was further subdivided into three parts, according to the types of tones, producing knowledge of high, medium and low tones and their combination. Music theory was divided into five sections; the first regarded the basic principles of music, the second was the science concerning the elements of music and the third was about the application of principles in musical practice. The fourth was about musical notation and the fifth about harmony in general, that is the principles of composition.⁶³

⁶² "Quid sit ipsa sic diffinitur: musica est pericia modulacionis sono cantuque consistens. Modulacio autem est quarumlibet rerum diuersarum concurs modificacio. Modificacio uero alia est elementorum in compositione mundi corruptibilis, alia humanorum in complexione corporis animalis, alia est sonorum armonia sensibilis. Prima est musica mundana, secunda humana, tertia instrumentalis. Quam quia predictis uerbis auctor diffinire uoluit, ideo postquam dixit 'modulacio' adiecit 'sono cantuque consistens'. Sonus est quicquid auditu percipi potest, siue sit animalium, siue non animalium scilicet quarumlibet rerum, ut frangor arborum et strepitus pedum. Cantus autem est uocis inflexio. Uox uero est, que per quasdam partes gutturis que arterie uocantur egreditur et ab animali profertur. Unde proprie uox hominum et irrationabilium animalium est". Dominicus GUNDISSALINUS, *De divisione philosophiae*, Book X, [in:] *Beiträge zur Geschichte der Philosophie des Mittelalters*, Vol. IV/2–3, L. Baur (ed.), Münster 1903: 96.

⁶³ "Partes uero alias habet theorica, alias practica. Partes practice sunt tres: sciencia de acuto sono et sciencia de graui et sciencia de medio. De hiis enim tractat ostendens utilitates eorum et comparaciones eorum inter se, et quomodo ex eis componuntur cantilene. Partes uero theorice sunt quinque. Quarum prima est sciencia de principiis et primis, que debent administrari in acceptione eius, quod est in hac sciencia et quomodo eciam administrentur illa principia et qualiter inuenta sit hec ars et ex quibus et ex quot componatur et qualiter oportet

Dominicus Gundissalinus' *De divisione philosophiae*, just as *Didascalion* by Hugh of St. Victor, is a good example of how the idea of the trisection of music, introduced by Boethius, invaded philosophy while at the same time became less important in the theory of music. Its diminishing standing was reflected in the content of the musical treatises of the time, with the writings mentioned above being telling evidence. There were authors who, although they based their ideas on the treatises that were clearly under the influence of *De institutione musica*, chose to ignore the ideas of Boethius himself. Such was the case with the treatise by an obscure author, known as Joannes Presbyter, who undoubtedly derived his ideas from Hugh's *Didascalion*. His explanation of the etymology of the term "music" was directly copied from Hugh of St. Victor, whereas he did not divide music into three types after Boethius. According to this author (and the typology different to the tradition of *De institutione musica*) music was divided into three sections: harmony, rhythmicity and metrics.⁶⁴ In fact this classification is divergent from the Boethian division not only in its content but also in the criterion used by its author. Many other analogous examples of that kind can be found in the twelfth century manuscripts but it does not seem necessary to discuss them individually. Instead I shall discuss

inquiri id, quod est in ea. Secunda est doctrina de dispositionibus huius artis, scilicet inveniendi neumata et cognoscendi numeros eorum, quot sunt, et species eorum et declarandi proportionum quarundam ad alias et demonstrationes de omnibus illis; et docet species ordinum et situm eorum, quibus preparantur, ut unusquisque accipiat ex eis quod vult et componat ex eis armonias. Tercia est doctrina de conueniencia principiorum et de sermonibus et demonstrationibus specierum, instrumentorum artificialium, que preparantur eis, et de acceptione omnium eorum in ea et situ ipsorum in ea secundum mensurationem, que assignatur in principiis. Quarta est doctrina de speciebus casuum naturalium, que sunt pondera neumatum. Quinta est doctrina de compositione armoniarum in summa; deinde de compositione armoniarum integrarum, scilicet illarum, que sunt posite in sermonibus metricis compositis secundum ordinem et ordinationem et qualitatem artis eorum secundum unamquamque intencionem armoniarum; et docet quomodo fiant penetrabiliores et magis ultime in ultimitate intencionis, ad quam facte sunt". Dominicus GUNDISSALINUS, *De divisione...* (1903): 97–98.

⁶⁴ "Musica: A musis per derivationem apo tou moys appellata. Est moys graece et latine aqua. Sicque dicta eo quod per eam quaerebatur virtus carminum et vocis modulationes, quia veraciter canendi scientia et facilis ad perfectionem canendi via, omni generi musicorum. Musica (ut alii dicunt) appellata est apo tou mason, id est a quaerendo; quod per eam vis carminum et vocis modulatio quaeritur. Musicae partes sunt tres: harmonica, rhythmica, metrica. Harmonica est quae discernit in sonis acutum et grave; rhythmica est quae requirit in cursione verborum utrum bene sonus, an male cohaereat; metrica est quae mensuram diversorum metrorum probabiliter cognoscit ut, verbi gratia, heroici, iambici, et caetera". Joannes Presbyter, *De musica antica et moderna*, [in:] A. de la FAGE, *Essais de diphthéographie musicale*, Paris 1864: 406.

some of the anonymous writings of the time, which are also a valuable source of research into the reception of Boethius' theory, although most frequently they cannot be associated with any specific intellectual centre.

Two anonymous treatises are especially interesting; both twelfth century manuscripts are stored in the library of the University of Basel, under the reference F. IX. 54. They were initially mistakenly attributed to St. Thomas Aquinas, and published as one treatise by Mario di Martino.⁶⁵ However, detailed analysis of the manuscript allows for the conclusion that these are in fact two separate works. The first treatise, entitled *Ars musice armonie*, comprises pages 1r-4v of the manuscript and the second *Ars musice* pages 5r-8v. Both are worthy examples of the reception of Boethius' theory in the twelfth century.

In *Ars musice* there is a passage saying that, just as Boethius' works would have it, music can be regarded as the first among the liberal arts. What is interesting is that the author of the treatise focused mainly on the cosmological aspects of music by saying that music was about the arrangement of celestial bodies, the fusion of the elements and the harmonious merging of body and soul. According to the definition which is of interest to us music is an art of contemplation of various harmonies, divided into the types known from *De institutione musica*, whereas *musica instrumentalis* is further subdivided. The first division regards the types of instruments used for producing a sound, such as natural instruments (*instrumenta naturalia*) i.e. teeth, tongue, palate, and instruments created by craft (*instrumenta artificialia*), such as the lyre, drums etc. As far as its subject is concerned, *musica instrumentalis* is subdivided into the science of melody (*melyca*), rhythm (*richmica* [sic]) and metrics (*metrica*). The author of the treatise explained the phenomena of the music of human nature and music of the spheres in traditional terms, but he did not mention any real sound produced by the celestial bodies.⁶⁶ Other definitions of music quoted by

⁶⁵ M. di MARTINO, *Ars musice, trattato inedito illustrato e trascritto da Mario di Martino*, Napoli 1933. Both treatises were written with some elements of dialect, hence the non-standard spelling of some words.

⁶⁶ "Quoniam inter vij. liberales artes musica primatum optinet testante Boecio. utpote illa. que de complexione corporum celestium. et coniunctione elementorum et armonica vnione corporis et anime continet. (...) Musica est ars contemplandi diuersitates consonanciarum. (...) Musica alia instrumentalis. alia mundana. alia humana. (...) Instrumentalis musica est discernendis et cognoscendis cantibus attributa. Consistit tum in artificialibus tum in naturalibus instrumentis. Naturalia instrumenta sunt ligua. dentes. palatum. et cetera. quibus uox formatur. Artificialia sunt quibus sonus per doctrinam. et industriam elicetur ut lira. et tympanum. et cetera. que humano exercicio sunt inuenta. Humana est que in proporionali institutione rerum

the author are evidence of the growing importance of polyphonic music, and so music is either an art (*ars*) or science (*sciencia*). It is a science either about simple voices (choral) or composite ones (polyphonic music).⁶⁷

The first of the treatises of the Basel manuscript is almost identical in content so it will not be discussed here. It is, however, worth noting that a diagram illustrating the ethos of eight church modes was included with it. The diagram also illustrated the harmony of human nature. The authentic scales were placed in the four lower fragments of the circle and the plagal in the upper. The outermost circle described the music of human nature, which is the music (harmony) of the soul, body and the music of their psychophysical connection, and also singing (*musica in voce*). The authentic modes were connected with the four bodily fluids, associated with temperaments, the plagal modes with the corresponding virtues. Each mode was assigned a corresponding kind of human character, as they were arranged into the following complexes:

Modes

Dorian	– blood	– for nice and cheerful people
Phrygian	– bile	– for severe people
Lydian	– phlegm	– for lewd people
Mixolydian	– black bile	– for shrewed people
Hypodorian	– justice	– for elderly people
Hypophrygian	– temperance	– for hypocritical people
Hypolydian	– wisdom	– for sad people
Hypomyxolydian	– courage	– for noble people

humane fabrice et concordie iunctura. elementorum mundi et positione humanorum quatuor. in humano corpore. sed armenica vnione anime et corporis consistit. Mundana est que constat in complexionali effectu elementorum mundi et supercelestium corporum motu dissimilli. Item instrumentalis alia melyca. alia metrica. alia richmica. Melyca [est supra lin.] que cantibus discernendis et cognoscendis proportionaliter est attributa. Metrica est sciencia sillabis cognoscendis. acomodata. que longa que breuis sit discretiua. Richmica est sciencia vnus sillabarum in richmo ponendarum super faciem non directum uel obliquum syderum cursum. sed musica consonanciam inuenit animam esse licet nullum predictorum nisi per eam consistere habeat". Anonymous author, *Ars musice*, Basel, Universitätsbibliothek, F. IX. 54, p. 5r (http://www.chmtl.indiana.edu/tml/12th/ANOARSMA_MBUFIX54.html), accessed on: 12.12.2012.

⁶⁷ "M[usica] est ars uel sciencia. liberalis subministrans copiam perice canendi vel musica est motus uocis. Vel musica est sciencia uocum sibi inuicem concordancium. Vel musica est sciencia uocum tam simplicium quam compositarum". Anonymous author, *Ars musice*..., p. 5v.

It is important to observe that the impact of each of the scales on the soul, in a certain specific way, can be discussed only in terms of the Pythagorean assumption of the similarity between the principles which, on the one hand, rule music and, on the other, are behind the construction of the human soul. The acceptance of the thesis of the existence of *musica humana* made the development of the ancient teaching of the ethos of musical scales possible at all; therefore Boethius should be considered one of the most important authors to have contributed to this concept.

Any further discussion of anonymous treatises of the period would fail to produce new information. Most observations made on the occasion of the analysis of treatises signed by their authors can be also referred to the anonymous works. In fact new qualities and problems relating to the issues we are discussing here are linked with the transformations of the systems of education, as they appear in the thirteenth century.

The concept of the harmony of the spheres in the writings of the thirteenth century authors

The thirteenth century brought yet another advance in the history of science. The appearance of universities, with their considerable autonomy in the choice of the content and methodology of lectures and even with their own jurisdiction, produced entirely new qualities in science and philosophy. S. Swieżawski compares the turn of the twelfth and the thirteenth centuries to the Carolingian Renaissance, in terms of the scale of the transformation.⁶⁸ The university in Paris seems to have played a particular role in this process, as relayed by F. Copleston:

The leading professors and theologians of the thirteenth century were all associated at some period with the University of Paris, which arose out of the body of professors and students attached to the Cathedral School of Notre Dame and other schools of Paris, the statutes of the university being sanctioned by Robert de Courçon, Papal Legate in 1215. Alexander of Hales, St. Bonaventure, St. Albert the Great, St. Thomas Aquinas, Matthew of Aquasparta, Roger Marston, Richard of Middleton, Roger Bacon, Giles of Rome, Siger of Brabant, Henry of Ghent, Raymond Lull, Duns Scotus (d. 1308)—they all either studied or taught (or both) in Paris. Other centres of higher education were, however, growing in importance and acquiring the tradition of their own. Thus with the University of Oxford were associated the names of men

⁶⁸ See: S. SWIEŻAWSKI. *Dzieje...* (2000): 554.

like Robert Grosseteste, Roger Bacon and Duns Scotus, and whereas Paris was the scene of the triumph of Aristotelianism, the name of Oxford recalls a characteristic combination of Augustinian tradition with 'empiricism', as in the philosophy of Roger Bacon. Yet in spite of the importance of Oxford, Bologna and, at times, the Papal Court, the University of Paris was easily the most important centre of higher studies in the Christendom of the thirteenth century. Scholars might come to Paris for their studies and then return to Oxford or Bologna to teach thus carrying with them the spirit and ideals of the great university, and those scholars who never themselves set foot in Paris were subject to Parisian influence. Robert Grosseteste for instance, who possibly never studied at Paris, was certainly influenced by the professors of Paris.⁶⁹

Defining the position of music in the university education system will also enable us to specify the place of the harmony of the spheres concept in the late Middle Ages. Boethius' treatise provided the basis for teaching music at the universities in Paris and Oxford.⁷⁰ The 1431 statute of the Oxford University asserted that music should be taught on the basis of Boethius' works.⁷¹ Any essential changes in the systematization of sciences which were the effect of adjusting the systematization to the actual state of affairs in science, as required by the practice of university teaching, led to the redefining both the subject of music and its place among other disciplines. In E. Witkowska-Zaremba's words:

The formation of music as a university discipline created a new impulse for the systematization of music-related issues, in the aspect of theory—practice. In the thirteenth century treatises a tendency to give two definitions of music is evident: one captured music as *scientia de numero* and the other as *scientia canendi* (this tendency had been with time turned to a customary use). Both definitions reflect the division of musicography into two sections, although it was only sketchy at the time: a section focused on the themes originated in Boethius' *De institutione musica*, and a section including *ars canendi*, whose themes were defined by the categories of *musica plana* and *musica mensuralis*. *Musica theorica* and *musica practica* are, on this view, two different disciplines with different subject matter and different objectives.⁷²

⁶⁹ F. COPLESTON, *History...*, Vol. II, *Medieval Philosophy*, London 2003: 2012.

⁷⁰ E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 36.

⁷¹ "Musicam per terminum anni, videlicet Boecii". M. HOCHADEL, *Zur Rezeption der "Institutio Musica" von Boethius an der spätmittelalterlichen Universität*, [in:] *Studien und Texte zur Geistesgeschichte des Mittelalters*, Vol. LXII: *Musik—und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter*, F. Hentschel (ed.), Leiden 1998: 192.

⁷² E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 48–49.

The curriculum of the Parisian faculty of arts of 1230 and 1240–45, which was partly published by M. Haas⁷³, can be considered a model of university education of the thirteenth century. Under the influence of Aristotle, music (separated from physics) was considered to be a purely mathematical science, whose subject matter was no longer the investigation of the laws that govern the universe. *Musica mundana*, being as it was beyond our perceptual capacities, was no longer part of the university music curriculum. The reception of nature-related works by Aristotle led to the situation in which the harmony of the spheres concept was already being undermined in the second half of the thirteenth century (for example Roger Bacon denied reality to the sounds of the music of the spheres), although it was only exhaustively criticized in the fourteenth century. The model of teaching at the Parisian university reflected this situation; sciences were divided into three main areas, including the liberal arts, although arts did not exhaust the whole range of disciplines actually cultivated.

Philosophia

- | | | |
|----------------|--------------|---------------|
| 1) naturalis | 2) practica | 3) rationalis |
| a) metaphysica | a) economica | a) rhetorica |
| b) physica | b) politica | b) grammatica |
| c) mathematica | c) ethica | c) logica |
| – arithmetica | | |
| – astronomia | | |
| – musica | | |
| – geometria | | |

In the area of *philosophia naturalis*, in metaphysics and physics it was the Aristotle's writings that led the way. In the mathematical sciences three authors were respected and considered as authorities; these were Ptolemy in astronomy, Euclid in geometry and Boethius in arithmetics and music.⁷⁴ Roger Bacon (ca. 1214–1292) wrote much about the role and position of music. Bacon, like his teacher Robert Grosseteste, was under the strong influence of St. Augustine, which is clearly visible in various fragments of his works devoted to music. In order to fully realize the significance of music in Roger Bacon's system, we have to first refer to his classification of the sciences.

⁷³ M. HAAS, *Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts*, [in:] *Aktuelle Fragen der musikbezogenen Mittelalterforschung*, Winterthur 1982: 354–357. The model of this programme is quoted here after E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 35.

⁷⁴ E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 35.

For Bacon, mathematics was the fundamental and most relevant discipline, necessary for the study of all sciences, including theology. Bacon blamed many of his contemporaries for not knowing mathematics sufficiently,⁷⁵ which was why they were even unable to perceive their own ignorance.⁷⁶ The first of the proofs supporting the thesis of the significance of mathematics is the proof *from authority*.⁷⁷ He says in *Opus majus* that if Boethius himself thought that one could not know much without the knowledge of mathematics and Aristotle mentioned mathematics as one of the methods of philosophy, the study of it was therefore necessary.⁷⁸ Music held a special place among the mathematical disciplines, as its purpose was to reveal principles through a consideration

⁷⁵ This charge was directed at Albert the Great, Alexander of Hales and also (without saying so explicitly) St. Thomas Aquinas. S. SWIEŻAWSKI, *Dzieje...* (2000): 585, 591.

⁷⁶ This is what Roger Bacon says in *Opus Majus*: "There are four great sciences, without which the other sciences cannot be known nor a knowledge of things secured. If these are known any one can make glorious progress in the power of knowledge without difficulty and labor, not only in human sciences but in that which is divine. The virtue of each of these sciences will be touched upon not only on account of knowledge itself, but in respect to the other matters aforesaid. Of these sciences the gate and key is mathematics, which the saints discovered at the beginning of the world, as I shall show, and which has always been used by all the saints and sages more than all other sciences. Neglect of this branch now for thirty or forty years has destroyed the whole system of study of the Latins. Since he who is ignorant of this cannot know the other sciences nor the affairs of this world, as I shall prove. And what is worse men ignorant of this do not perceive their own ignorance and therefore do not seek a remedy". Robert Belle Burke (transl.), *Opus Majus of Roger Bacon 1928, Part 1*, Philadelphia, 2005: C-118.

⁷⁷ Bacon's argument *from authority* is particularly significant in this case because we know from other sources that he was against this kind of reasoning. Just like Adelard of Bath, Bacon thought that authority is often like a 'bridle' stifling one's freedom of thought. S. SWIEŻAWSKI, *Dzieje...* (2000): 509.

⁷⁸ "As regards authority I so proceed. Boethius says in the second prologue to his Arithmetic, 'If any inquirer lacks the four parts of mathematics, he has very little ability to discover truth'. And again 'Without this theory no one can have a correct insight into truth.' And he says also, 'I warn the man who spurns these paths of knowledge that he cannot philosophize correctly.' And again 'It is clear that whosoever passes these by has lost the knowledge of all learning.' He confirms this by the opinion of all men of weight saying, 'Among all the men of influence in the past, who have flourished under the leadership of Pythagoras with a finer mental grasp, it is an evident fact that no one reaches the summit of perfection in philosophical studies, unless he examines the noble quality of such wisdom with the help of the so-called quadrivium'. And in particular Ptolemy and Boethius himself are illustrations of this fact. For since there are three essential parts of philosophy, as Aristotle says in the sixth book of the Metaphysics, mathematical, natural and divine, the mathematical is of no small importance in grasping the knowledge of the other two parts, as Ptolemy teaches in the first chapter of the Almagest, which statement he also explains further in that place." Robert Belle Burke (transl.), *Opus Majus...* (2005): C-117.

of the essence of words. Music was divided into four sections: prosody, metre, rhythm and lyrics. Grammar and logic were causally dependent on music. It was the aim of logic to produce arguments which should be beautiful. Because the ultimate goal of the sciences was to refer to reality, it was logic's task to compare the principles of logic to argumentation, which was the reason why logic had to "beg" (*mendicare*) for music's help.⁷⁹ Bacon thought of music as mathematics and concluded that mathematical proofs owed their beauty to music.⁸⁰ *Doctor mirabilis* quoted Boethius and recognised authority in many of his works, which did not alter the fact that he defined this branch of science in different terms. He did not accept the Boethian trisection and his idea of the place of music among other disciplines was slightly different. He remained under the influence of St. Augustine, especially of his *De musica* and *De ordine*.⁸¹ Music in Bacon's classification was a mathematical discipline, which just like mathematics was present in astronomy, but it did not teach us about celestial

⁷⁹ "For it is the function of another science to give the reasons for these things, namely, of that science, which must consider fully the nature of tones, and this alone is music, of which there are numerous varieties and parts. For one deals with prose, a second with meter, a third with rhythm and a fourth with music and singing (...) Therefore grammar depends causatively on music. In the same way logic. For the purpose of logic is the composition of arguments that stir the active intellect to faith and to love of virtue and future felicity, as we have already shown, which arguments are handed down in the books of Aristotle on the arguments as has been stated. But these arguments must have a maximum amount of beauty, so that the mind of man may be drawn to the truths of salvation suddenly and without previous considerations. And Alfarabius especially teaches this in regard to the poetic argument, the statements of which should be sublime and beautiful, and therefore accompanied with notable adornment in prose, meter and rhythm as befits place, time, personages and subject for which the plea is made. And thus Aristotle taught in his book on the Poetic Argument, which Hermannus did not venture to translate into Latin on account of the difficulty of the metres, which he did not understand, as he himself states in the prologue to the commentary of Averroes on that book. And therefore the end of logic depends upon music. But the end of everything is the noblest part in every matter and imposes necessity on what is related to it, as Aristotle states in the second book of *Physic*; nor have those things any utility of their own which are naturally formed for the end, except when they are related to their end, as is clear in individual cases. And therefore the whole utility of logic is drawn from the relation of all logical arguments to arguments of this kind, and therefore since they depend on the arguments of music, necessarily logic must depend on the power of music." Robert Belle Burke (transl.), *Opus Majus...* (2005): C-118-119.

⁸⁰ W. TATARKIEWICZ, *Historia Filozofii* [History of Philosophy], Warszawa 1970: 201.

⁸¹ The presence of motifs drawn directly from the works of Augustine, mentioned here, is discussed by N. van Deusen, 'Roger Bacon on Music', [in:] *Studien und Texte zur Geistesgeschichte des Mittelalters*, Vol. LVII: *Roger Bacon and the sciences: commemorative essays*, J. Hackett (ed.), Leiden 1997: 224-225.

bodies. The reflection on the music of the spheres was therefore not considered its subject matter. Bacon's classification of the sciences is as follows:⁸²

Philosophy

- | | |
|----------------|-------------------------|
| 1) mathematics | 2) special sciences |
| a) geometry | a) science of weights |
| b) arithmetics | b) alchemy |
| c) music | c) medicine |
| d) perspective | d) experimental science |
| e) astronomy | |
| – speculative | |
| – empirical | |
| – astrology | |

The privileged position of the natural sciences in Bacon's classification is quite evident. He thought of experience and experiments as having a special role in scientific inquiry. According to Bacon even rational inquiry was uncertain and exposed to errors and it was only experiments which could provide irrefutable evidence for one's theses.⁸³ And so a system of sciences had to include *scientia experimentalis*, which was an experimental verification of the laws proposed by other sciences. A consequence of Bacon's empiricism was his rejection of the music of the spheres concept, in direct reference to Boethius' theory. In *Communia mathematica* we find a passage saying that the music of the spheres and human music in fact do not exist as real sound phenomena.⁸⁴

⁸² J. HACKETT, *Roger Bacon on the Classification of the Sciences*, [in:] *Studien und Texte zur Geistesgeschichte des Mittelalters*, Vol. LVII: *Roger Bacon and the sciences: commemorative essays*, J. Hackett (ed.), Leiden 1997: 63.

⁸³ "For there are two modes of acquiring knowledge, namely by reasoning and experience. Reasoning draws a conclusion and makes us grant the conclusion, but does not make the conclusion certain, nor does it remove doubt so that the mind may rest on the intuition of truth, unless the mind discovers it by the path of experience; since many have the arguments relating to what can be known but because they lack experience they neglect the arguments, and neither avoid what is harmful, nor follow what is good. For if a man who has never seen fire should prove by adequate reasoning that fire burns and injures things and destroys them, his mind would not be satisfied thereby, nor would he avoid fire until he has placed his hand or some combustible substance in the fire, so that he might prove by experience of combustion his mind is made certain and rests in the full light of truth. Therefore reasoning does not suffice, but experience does." Robert Belle Burke (transl.), *Opus Majus of Roger Bacon 1928, Part 2*, Philadelphia, 2005: C-583.

⁸⁴ "Quapropter manifestum est quod sonus non generatur ex radiis, et ideo nulla est Musica mundana nec eciam humana que assignatur in armonia et proporcione quatuor elementorum adinvicem in corpore humano et in conveniencia corporis ad animam et in partibus anime

This does not mean that human structure or the structure of the universe are lacking in proportions, but simply that we cannot infer the existence of inaudible music from them. It is clear then that in spite of all the admiration that Bacon had for Boethius he rejected his theory, although Boethius' thinking could be of service to him as an example of the error that reason is exposed to if unsupported by experience.

Boethius accepted the existence of the music of the spheres on the basis of pure speculation. He simply thought that it was impossible for a mechanism as fast and perfect as the spheres not to produce any sound. However, for Bacon the fact that we could not hear the sound settled the argument. He clearly remained unconvinced by the arguments quoted by many authors who had tried to provide the reasons for why we could not hear it. Roger Bacon is the first author who so clearly and directly rejected Boethius' theory. He was undoubtedly an eccentric, considered controversial among his contemporaries, as the many troubles he had with his superiors would indicate. Yet his work in some ways reflects the trends prevailing in science at the time, especially with respect to the place of music among the disciplines of science taught at universities.

The inclusion of music in the university curricula was essential to the reception and criticism of the concept of the music of the spheres. The specific character of intellectual life at the medieval universities had a major influence on the development of the theory discussed here. The work of the scholastics at faculties of arts was not limited to providing commentaries to Aristotle's work or disputes on the problems derived from Aristotle's writings. In fact the discussions held at the 13th century Faculty of Arts at the University of Paris referred to a wide range of disciplines and problems, including issues relating to grammar, logic, natural philosophy, moral philosophy and mathematics (including music). The *Quaestiones* found in the manuscripts of this period, however brief, are without a doubt to a large extent a testimony to the intellectual character of the discussions actually held.⁸⁵

adinvicem conformibus. Istud totum est falsum quoniam non sunt ibi proporciones quantitatis et partium ejus, quas proporciones solum considerat Musica sicut tota Mathematica, et ideo proporciones et armonie que hic debent esse sunt omnino aliene a proprietatibus (aliter proporcionibus) quantitatis et Mathematice". Roger BACON, *Communia mathematica*, R. Steele (ed.), Oxford 1940: 53.

⁸⁵ O. WEIJERS, *La disputatio à la faculté des Arts de Paris (1200–1350). Esquisse d'une typologie*, Turnhout 1995: 92–117.

The discussions on music held at the time had essentially contributed to the transformations in the theory of music, and many of the authors of interest to us were the Parisian masters.

One of the first pupils of St. Thomas Aquinas, Vincent of Beauvais (d. 1264), is an author of an extensive encyclopaedia of sciences entitled *Speculum Maius*, consisting of over 80 books, which altogether included 9885 chapters.⁸⁶ This compendium of knowledge consists of three parts: *speculum naturale*, *doctrinale* and *historiale*. Book XVII of the *speculum doctrinale* is devoted to music.

In the part of the encyclopaedia dedicated to music, Vincent of Beauvais set out to present a variety of earlier views on music by citing such authors as Richard of St. Victor, Al-Farabi, Isidore of Seville and Boethius. At the beginning of Book X, Vincent quoted various definitions of music produced by these authors, while he also presented larger fragments from Isidore's *Ethymology*, and also his deliberations on the impact of music on various aspects of reality. The following chapters—*De excellentia musicae*, *De observantia moralitatis in musica*, *De variis effectibus musicae*—were entirely based on Boethius' ideas included in Book I of *De institutione musica*. Other parts of the treatise include discussions on the most popular divisions of music according to Isidore, Al-Farabi and Boethius. The Boethian divisions were amended with ideas taken from the writings of Richard of St. Victor. Vincent fully accepted Boethius' division and used the same arguments.⁸⁷ The music of the world was

⁸⁶ S. SWIĘŻAWSKI, *Dzieje...* (2000): 704.

⁸⁷ "Musicae genera sunt tria: Prima quidem mundana est, secunda vero humana, tertia instrumentalis. Mundana in his maxime prospicienda est, quae in ipso caelo vel compage elementorum vel temporum varietate visuntur. Quomodo enim fieri potest, ut tam velox caeli machina tacito silentique cursu moveatur? Etsi ad nostras aures sonus ille non pervenit, quod multis fieri de causis necesse est, non poterit tamen motus tam velocissimus ita magnorum corporum nullos omnino sonos ciere, cum praesertim tanta sint stellarum cursus coaptatione coniuncti, ut nihil aequae compaginatum, nihil ita commixtum possit intelligi. (...) Humanam vero musicam quisquis in sese ipsum descendit intelligit. Quid est enim, quod illam incorpoream rationis vivacitatem corpori misceat, nisi quaedam coaptatio et veluti gravium leviumque vocum quasi unam consonantiam efficiens temperatio? Quid est aliud, quod ipsius inter se partes animae iungat, quae, ut Aristoteli placet, ex sensibili rationabilique coniuncta est? Quid est vero, quod corporis elementa permisceat, aut partes sibimet rata coaptatione contineat? Tertia est musica, quae in quibusdam consistere dicitur instruments". VINCENT OF BEAUVAIS, *Speculum doctrinale*, Book XVII, [in:] *Vinzenz von Beauvais O. P. (um 1194–1264) und sein Musiktraktat im Speculum doctrinale*, *Kölner Beiträge zur Musikforschung*, Vol. XV, G. Göller (ed.), Regensburg 1959: 94–95.

said to be manifested in the harmony of the elements, planets and times; the balance of elements actualized in number, weight and measure. Planets were balanced through their nature, position and movement. The harmony of time was observable in the succession of seasons, months (moon phases) and sequences of nights and days. The harmony of human nature was fulfilled in the human body, soul and their combination. Vincent recalled the well-known hierarchy of being when discussing the issue of the music of the human body. He said that music arose from bodily functions (common to all living organisms), balance of bodily fluids (common to all sentient beings) and intentional actions (a distinguishing feature of humans as rational beings). Vincent's survey of the music of the soul and psycho-physical harmony did not go further than the corresponding analysis of the Victorine authors, as was the case with *musica instrumentalis*, although Vincent took the trouble to make the Boethian notion of music *in spiritu*⁸⁸ more precise. He also subdivided *musica instrumentalis* further into music *in pulsu* (corresponding to the Boethian *in percussione* and *in intensione*), *in flatu* (part of the Boethian category of music *in spiritu*—the music of brass instruments) and *in voce* (singing, which comes under *musica in spiritu*).

Altogether the part of the *Speculum* dedicated to music is short, yet it allows us to make certain valuable observations. By looking at it from the perspective of the reception of Boethius' treatise we can follow the transformations that took place in theory of music. Perhaps the university circles of the time used a somewhat rigid version of Boethius' trisection and, more precisely, of its cosmological part, meaning that *De institutione musica* was read in a rather selective manner. Characteristically, Vincent repeated Boethius' classification, without introducing any changes to the notions of *musica mundana* and *humana*,

⁸⁸ "Richardus ubi supra: Musica alia mundana, alia humana, alia instrumentalis. Mundana alia in elementis, alia in planetis, alia in temporibus. In elementis alia in pondere, alia in numero, alia in mensura. In planetis alia in situ, alia in motu, alia in natura. In temporibus alia in annis, scilicet mutatione veris, aestatis, autumnus, hiemis, alia in mensibus, scilicet incrementis et decrementis lunaribus, alia in diebus, scilicet vicissitudine lucis et noctis. Musica humana alia in corpore, alia in anima, alia in connexu utriusque. In corpore alia in vegetationibus, alia in umoribus, alia in operationibus. Prima convenit omnibus nascentibus, secunda sensibilibus, tertia rationalibus. Musica in anima alia in potentiis, ut ira, ratio, alia in virtutibus, ut iustitia, fortitudo. Musica in connexu utriusque et illa naturalis amicitia, qua anima corpori non corporeis vinculis alligata tenetur. Musica instrumentalis alia in pulsu, ut in tympanis et chordis, alia in flatu, ut in tibiis et organis, alia in voce, ut in carminibus et cantilenis". VINCENT OF BEAUVAIS, *Speculum...* (1959): 95–96.

but when he turned to discussing the concept of *musica instrumentalis*, albeit briefly, he reached for the writings of the Victorine authors, whose works had better reflected actual musical practice. What is interesting is that the changes in the approach of researchers to music-related issues which took place in the thirteenth century university circles were not reflected in the writings of Robert Kilwardby, associated with the Paris university.

Robert Kilwardby (ca. 1215–1279), the Archbishop of Canterbury, cardinal and professor of the universities of Paris and Oxford, was a member of the Dominican order.⁸⁹ Among his works it is the treatise *De ortu scientiarum*, written ca. 1250 which especially deserves a mention. This is where Kilwardby proposed a classification of sciences based, in most part, on the writings of the Victorine scholars⁹⁰:

Philosophy⁹¹

- | | |
|---|--|
| 1) philosophy of 'divine things'
a) physics (<i>naturalis</i>)
b) mathematics (<i>mathematica</i>)
c) metaphysics (<i>metaphysica</i>) | 2) philosophy of 'human things'
a) practical
– ethics (<i>solitaria, privata, publica</i>)
– mechanics (<i>artes mechanicae</i>)
b) logic (<i>scientia rationalis</i>) |
|---|--|

In Kilwardby's classification music remained within the sphere of the mathematical sciences, which he justified by quoting Boethius' *De institutione arithmetica*. The Pythagorean-Platonian tradition played such an important role in Kilwardby's classification only in reference to music. He treated other sciences much more within the influence of Aristotle.⁹²

Such a traditional approach was even more meaningful in the context of Kilwardby's adherence to Boethius' ideas in spite of the fact that he undoubtedly knew Aristotle's treatise *On the Heavens*.⁹³

⁸⁹ S. SWIEŻAWSKI, *Dzieje...* (2000): 705.

⁹⁰ It is true that Robert Kilwardby used some ideas of the Victorine authors when working on his classification; he mostly drew from Hugh's thought, but also reached for other authors such as Isidore of Seville. However the division is still mostly Kilwardby's original idea. E. WHITNEY, 'Paradise restored: the mechanical arts from antiquity to the thirteenth century' [in:] *Transactions of the American Philosophical Society*, Vol. LXXX, Part. I, Philadelphia 1990: 118.

⁹¹ S. Swieżawski, *Dzieje...* (2000): 706.

⁹² E. HIRTLE, 'Die Musica in Übergang von der scientia mathematica zur scientia media', [in:] *Studien und Texte zur Geistesgeschichte des Mittelalters* Vol. LXII: *Musik—und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter*, F. Hentschel (ed.), Leiden 1998: 31–33.

⁹³ E. HIRTLE, 'Die Musica...' (1998): 33.

This is a treatise in which Aristotle attacked the Pythagorean concept of the music of the spheres. Kilwardby on the other hand not only traditionally placed music within the mathematical sciences but he also adopted the Boethian idea of the trisection of music, although he said that not every “music” (meaning harmony i.e. the union of opposites) is sonorous.⁹⁴ What this meant was that, according to Kilwardby, the semantic ranges of the notions of “music” and “harmony” were not identical, which he was very clear about in defining them differently. Harmony as the union of different things and music, following another Dominican, Gundissalinus, was defined as fluency in the modulation of sound and singing.⁹⁵ The separation of both concepts was evidence of a certain conservatism in Kilwardby himself, but also of the fact that he fully realized the situation in the sciences of the time. His contemporary, Thomas Aquinas, based his views on the place of music in the system of sciences on Aristotle’s writings and called music *scientia media*. Kilwardby’s ideas were similar although he never used the term. What he said in his writings was that the subject of music was *numerus harmonicus*—the numbers which, in contrast to the abstract numbers considered by arithmetic, were in some way entangled in material objects and therefore more solid.⁹⁶ According to E. Witkowska-Zaremba this reflects the status of music as a *scientia media*.⁹⁷ This unclear position of music is quite problematic to the theorists of the period discussed here. In the treatises of the mid- and late-thirteenth century it was with an increased frequency that music was discussed as a mathematical discipline independently of singing and of the issues relating to rhythm notation. A good example of

⁹⁴ “Hinc igitur triplicem musicam statuerunt sive harmonicam, scilicet mundanam, humanam et instrumentalem. Unde non omnis musica sonora est, sicut nec omnis harmonia, sed omnis harmonia sonorum est sonora, et de hoc exequitur et tractat Boethius in Musica sua in principio eiusdem dicta tria genera musicae distinguens”. Robert KILWARDBY, *De ortu scientiarum*, [in:] *Auctores britannici medii aevi*, Vol. IV, London 1976: 52–53.

⁹⁵ “Harmonia autem nihil aliud est quam rerum diversarum concors ad invicem coaptatio sive modificatio. Musicam autem sonoram sic definit Gundissalinus: Peritia modulationis sono cantuque consistens”. Robert KILWARDBY, *De ortu scientiarum...* (1976): 54.

⁹⁶ “Aliud etiam est quare mihi videtur addendum esse hoc ipsum harmonicum ad relationem numeri in subiecto musicae, scilicet quia numerus ut a musico consideratur est numerus concretus cum rebus naturalibus. Unde est ex appositione respectu numeri de quo considerat arithmeticus, et compositor eo et materialior; et ideo dixi quod est de numero harmonice relato vel de rebus harmonica proportionem invicem aptatis secundum quod huiusmodi, volens per harmonicam relationem intelligi concretionem et materialitatem quae inest numeris de quibus considerat musicus”. Robert KILWARDBY, *De ortu scientiarum...* (1976): 57.

⁹⁷ E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 45.

such research approach is the work of a Dominican, known as Hieronimus de Moravia, whose origins and identity are quite unclear. He must have died after 1271 but it is not clear whether his nickname “de Moravia” points us towards the Moray region (or more precisely to the Dominican convent in Elgin, Scotland), which is most likely, or perhaps that he originally came from a Dominican community in Moravia.⁹⁸ Hieronimus is the author of an important theoretical treatise, written in 1272 or later—it can be only be dated on the basis of the analysis of its content. Hieronimus quoted a commentary to Aristotle’s *De caelo et mundo* by Thomas Aquinas, which was completed in 1272. Knowing the date of Hieronimus’ work is important in the sense that it enables us to establish his sources. It is really surprising, for example, that none of the studies of Hieronimus’ treatise (entitled *Tractatus de musica* or *Ars musica*), or the related encyclopaedic entries,⁹⁹ mention the similarities between his work and Book XVII of the *Speculum doctrinale* of Vincent of Beauvais, who had died almost ten years before the most likely date of the writing of *Ars musica*. A comparison of both works leaves us in no doubt that Hieronimus knew the *Speculum* well, and he obviously could have known its author as both scholars lived and worked in Parisian circles almost at the same time, and both belonged to the Order of Preachers. The structure of the initial fragments of *Ars musica* and Book XVII of *Speculum* are almost identical. Both authors referred to the same masters, but if this was considered inconclusive, they also discussed the issues of interest to them in exactly the same sequence. Hieronimus’ treatise is slightly expanded in comparison to the original work; i.e. he quoted more authors when discussing the definition and subject of music. He was also more attentive to the problems of the relations between musical theory and practice (he quoted fragments of works by Guido of Arezzo), which makes it even clearer that his treatise was written after *Speculum*, at the time when the awareness of the problem was higher. I shall not discuss Hieronimus’ treatise in detail as the most interesting parts of his work are almost identical with Book XVII of the *Speculum* by Vincent of Beauvais, but it is perhaps worth pointing out certain differences between the two. As I have already mentioned here, Hieronimus considered music in a number of aspects: he discussed the

⁹⁸ C. Meyer (ed.), *Jérôme de Moravie: un théoricien de la musique dans le milieu intellectuel parisien de XIII^e siècle: actes du Colloque de Royaumont, 1989*, Paris 1992.

⁹⁹ F. HAMMOND, E. H. ROESNER, ‘Hieronymus de Moravia [Hieronymus Moravus, Jerome of Moravia, Jerome of Moray]’, [in:] S. Sadie (ed.), *The New Grove ...* (2002), Vol. XI.

issues of music understood as a mathematical discipline and as choral singing. The discussions of mensural notation are of particular interest but this is not the only feature distinguishing Hieronimus' treatise from the work of Vincent de Beauvais. However, with all its originality and novelty Hieronimus did reach for the original source of *De institutione musica* when discussing the classification of music according to Boethius, not only in the explication of such concepts as *musica mundana* and *musica humana* (defined and developed in a similar fashion to Vincent's equivalent concepts),¹⁰⁰ but also as far as the subdivision of *musica instrumentalis* was concerned. Unlike Vincent of Beauvais, Hieronimus subdivided this category exactly like Boethius into music *in intensione*, *in spiritu* and *in percussione*.¹⁰¹ This obviously does not mean that he

¹⁰⁰ Hieronimus de Moravia just like Vincent of Beauvais developed Boethius's trisection on the basis of the writings of Richard of St. Victor.

¹⁰¹ "6. Divisio musicae secundum Boetium. Boethius vero in prohemio sic dividit musicam dicens: Principio igitur de musica disserenti illud interim dicendum videtur, quot musicae genera ab ejus studiosis comprehensa esse noverimus. Sunt autem tria. Et prima quidem mundana est, secunda vero humana, tertia, quae in quibusdam instrumentis constituta est, ut in cithara vel tibiis ceterisque, quae cantilenaefamulantur. Et primum ea, quae est mundana, in his maxime perspicenda est, quae in ipso caelo vel compage elementorum vel temporum varietate visuntur. Quomodo enim fieri potest, ut tam velox caeli machina tacito silentique cursu moveatur. Et si ad nostras aures sonus ille non pervenit, quod multis de causis necesse est fieri, non poterit tamen motus tam velocissimus ita magnorum corporum nullos omnino sonos ciere, cum praesertim tanta sint stellarum cursus coaptatione conjuncti, ut nihil aequae compaginatum, nihil ita commixtum possit intelligi. Namque alii planetarum excelsiores, alii inferiores feruntur atque ita omnes aequali incitatione volvuntur, ut per dispares inaequalitates ratur cursum ordo ducatur. Unde non potest ab hac caelesti vertigine ratur ordo modulationis absistere. Jam vero quatuor elementorum diversitates contrariasque potentias nisi quaedam harmonia conjungeret, quomodo fieri posset, ut in unum corpus ac machinam convenirentur. Sed haec etiam omnis elementorum diversitas ita et temporum varietatem parit et fructuum, ut tamen unum anni corpus efficiat. Unde si quid horum, quae tantam varietatem rebus ministrant animo et cogitatione decerpas, cuncta pereant, nec, ut ita dicam, quidquam consonum servent. Et sicut per simile in gravibus chordis is vocis est modus, ut non ad taciturnitatem gravitas usque descendat, atque in acutis ille custoditur acuminis modus, ne nervi nimium tensi vocis tenuitate rumpan- tur, sed totum sibi sit consentaneum atque conveniens, ita etiam in mundi musica pervidemus nihil ita posse esse nimium, ut alterum propria nimietate dissolvat. Verum quidquid illud est, aut suos affert fructus, aut aliis auxiliatur ut afferant. Nam quod constringit hiems, ver laxat, torret aestas, maturat autumnus temporaque vicissim vel ipsa suos afferunt fructus vel aliis ut afferant subministrant. Humanam vero musicam quisquis in seipsum descenderit intelligit. Quid est enim, quod illam incorpoream rationis vivacitatem, id est animam corpori misceat, nisi quaedam coaptatio et velut gravium leviumque vocum quasi unam consonantiam efficiens temperatio. Quid est aliud, quod ipsius inter se partes animae conjungat, quae, ut Aristoteli placet, ex irrationabili rationabilique conjuncta est. Quid vero, quod corporis elementa permisceat, aut parte sibimet rata coaptatione contineat. Tertia est musica, quae in quibusdam consistere

took a step back but perhaps that he was more scrupulous in his reaching for the Boethian source. What is more, Hieronimus thought that the Boethian division, in spite of its shortcomings, reflected the existing state of affairs well.

Another important scholar who should be mentioned in this context is a Spanish theorist who taught the children of Alfonso X of Castile, Egidius of Zamora (Johannes Aegidius Zamorensis), who is the author of the treatise *Ars musica*, written ca. 1270, dedicated to the minister-general of the Franciscan order, John of Parma. Little is known of the author of the treatise considered to be one of the most conservative works of the end of the thirteenth century, although we know the peak of his scholarly activities falls between 1260–1280.¹⁰²

Egidius' treatise was mostly based on the views of Boethius, Plato, Guido of Arezzo, Isidore of Seville, Al-Farabi and the Bible. Large fragments of this work are almost literal repetitions of a text by Bartholomeus Anglicus, who lived earlier, ca. 1200–1272. Those parts of Egidius' work which are considered more original are dedicated to a brief discussion of the characteristics of musical instruments used at the time in Spain. It is, however, a passage devoted to the music of the spheres that is of interest to us. This fragment is evidence of a certain terminological confusion that already invaded the theory of the time. It may be also thought of as a reflection on the reception of Aristotelian cosmology; it is very difficult to decide unambiguously in this case. We know that a division of the universe into the two spheres of sublunar and superlunar was essential to Aristotelian cosmology. The spheres were differentiated by the

dicitur instrumentis. Haec vero ministratur aut intensione, ut nervis, aut spiritu, ut tibiis vel his, quae aqua moventur aut percussione quadam, ut in his, quae in concava quadam aerea virga feriuntur atque inde diversi efficiuntur soni. Haec Boethius. 7. Subdivisiones musicae secundum Ricardum. Subdivisiones musicae sunt Ricardi quae sequuntur: Musica, inquit Ricardus, alia mundana, alia humana, alia instrumentalis. Mundana alia in elementis, alia pondere, alia in numero, alia in mensura; in planetis alia in situ, alia in motu, alia in natura; in temporibus, alia in annis, scilicet mutatione veris, aestatis, autumnus et hiemis, alia in mensibus, scilicet incrementis et decrementis lunaribus, alia in diebus, scilicet vicissitudine lucis et noctis. Musica humana alia in corpore, alia in anima, alia in connexu utriusque. In corpore alia in cogitationibus, alia in humoribus, alia in operationibus. Prima convenit omnibus nascentibus, secunda sensibilibus, tertia rationabilibus. Musica in anima alia in potentiis, ut ira, ratio, alia in virtutibus, ut justitia, fortitudo. Musica in connexu utriusque est illa naturalis amicitia, qua anima corpori non corporis vinculis alligata tenetur. Musica instrumentalis alia in pulsu, ut in tympanis et chordis, alia in voce, ut in carminibus et cantilenis. Haec Ricardus". M. Cserba (ed.), *Freiburger Studien zur Musikwissenschaft*, Vol. II, Regensburg 1935: 23–26.

¹⁰² A. HUGHES, *Egidius [Johannes Aegidius; Juan Gil] de Zamora*, [in:] S. Sadie (ed.) *The New Grove...* (2002), Vol. VII.

types of movements that occurred in them and the material that the beings present in them were made of. In *Ars musica* Egidius introduced a new type of music, next to the three known to us from Boethius' *De institutione musica*, and he called it *musica coelestis*.

Let us have a closer look at the semantic fields of these concepts. In reference to the notion of *musica mundana*, Egidius initially said that it was also the music of heaven (using the term *coelis*), although when it came to more a detailed description he included all of the phenomena that belonged to the Aristotelian sublunar sphere, such as balance of the elements, succession of the seasons of the year etc. So far this is entirely in agreement with Boethius' ideas, as is the case with *musica humana* and *instrumentalis*.¹⁰³ The most interesting fragment of Boethius' treatise is the one in which he discussed the concept of *musica coelestis*, which was music that originated in consequence of the revolutions of the celestial spheres, and in support of this idea he quoted the frequently cited excerpt from the Bible and the well known argument by Boethius.¹⁰⁴ It seems that the exclusion of the music of the spheres from the

¹⁰³ In case of *musica instrumentalis* there are certain terminological discrepancies between Egidius' treatise and the Boethian original, but the differences are not particularly important.

¹⁰⁴ "Musicae peritiae multae sunt species sive modi. Siquidem alia est mundana, alia humana, alia coelestis, alia instrumentalis seu artificialis. Mundana musica est eorum, quae in coelis, vel in elis, vel in temporum vicissitudinibus et varietatibus aguntur, rationalis consideratio. Mundus enim quasi de quadam sonorum harmonia componi ab aliquibus iudicatur. Ligantur enim qualitates elementorum, et consonant sibi ad invicem quasi per quasdam congruentes chordarum consonantias et rationabiles harmonias. Tempora similiter temporibus et elementa temporibus coaptantur: aer veri congruit, ignis aestati, terra vero autumno, aqua similiter hyemi. Et Deus aeternus temporum dat tempora, ut alleviet homini fastidium, et alleviet labores homini, quasi quibusdam congruentissimis melodiis. Et quemadmodum consonant elementa temporibus, ita et haec duo consonant humoribus et corporibus. Nam aer et ver consonant sanguini, ignis et aestas cholerae, terra et autumnus melancholiae, aqua et hyems phlegmati, ut alibi de praedictis consonantiis et dissonantiis dictum fuit in libello de compendio scientiarum et de historia naturali, et in libro, cuius titulus est Archivus, id est Armarium. Humana vero musica est, quae in humana compagine consideratur, quam in se potest intelligere unusquisque. Unde Boethius, non constat homo, id est, non componitur absque musica, quae ita naturaliter est nobis coniuncta, ut si ea carere velimus, non possumus. Siquidem animae ad corpus, et e converso, suis mediantibus spiritibus, videlicet naturali, cuius sedes est in hepate, et vitali, cuius sedes est in corde, et animali, cuius sedes est in capite, magna musicae proportio est. Similiter humorum ad se invicem et ad corpus, et similiter ossium et nervorum, et arteriarum, et cartilaginum, et carni, et cutis ad se invicem, et ad corpus: unde et Plato dicit Deum animae musicae harmoniam. Similiter Boethius inquit: Quid, inquit, illam vivacitatem incorporationis corpori commisceat, nisi quaedam coaptatio veluti gravium leviumque vocum quasi unam consonantiam efficiendo temperatio? Hoc autem genus imitatur philosophica concordantia. Instrumentalis vero

notion of *musica mundana* is Egidius' attempt to reconcile the assumptions of Aristotelian cosmology with Boethius' views. It is certain that Egidius must have known the writings of the Stagirite because he was even pondering, in his treatise, the rightness of the thesis of the existence of a real sound arising from the impact of celestial bodies on the air masses. The interesting thing is that Aristotle's argument from *De caelo et mundo* was mentioned in Egidius' work without any commentary, as if in passing, as if merely to observe the order of things. Egidius was the first well known theorist to, against all earlier authors, introduce the notion of the "music of the world" as separate from the "music of the spheres". Almost all theorists and philosophers of the thirteenth century seemed to have been a little powerless towards in the face of the fact that the increasingly popular theses of Aristotle's cosmology were in contradiction with the traditional thesis of the music of the spheres. This is why quite a lot of them hardly mentioned the Pythagorean concept when discussing the Boethian classification of music. Others, such as Roger Bacon or Albert the Great tried, although rather timidly, to undermine the Boethian theses.

If one were to accept the interpretation presented above, Egidius would have been the first author to attempt to produce a certain fusion of Aristotelian cosmology with the Pythagorean doctrine in Boethius' model. Egidius' approach is very interesting and perhaps should be considered as one of the few examples of the creative handling of Boethius' theory, not only in the thirteenth century, and also the first such attempt for a very long time. In this context Egidius of Zamora deserves a much more significant place in the pan-

imitatio, quae instrumentis constat artis vel naturae, nostrae subiacet considerationi. Guido vero et Iohannes, et alii musicae peritiae speculatores communiter distinxerunt, quod primum musicae peritiae genus est illud, quod instrumentis agitur; secundum, quod instrumentis carminum habetur; tertium vero genus est illud, quod opus instrumentorum et carminum ratione diiudicat: duos vero modos primos claudos teste Guidone diiudicat, quia uno tantum pede incedunt, videlicet exercitii pede vel operationis, pede vero rationis aut intellectus, qui ad musicam proprie spectat, carent. Non enim cantores tantum dicendi sunt musici, cum solo usu et confuse, non ratione, aguntur; sed qui pede rationis reguntur, secundum Boetium et Guidonem. Musica vero coelestis est illa, qua ipsum coelum cum circulis in eis contentis sub harmonica modulatione volvi describunt, quia ex motu coeli et siderum quaedam secundum ipsos prodeunt symphoniae musicis modulationibus annotatae, iuxta illud Iob: Concentum coeli quis dormire facit? Unde quaerit Boethius, quomodo fieri possit, quod tam velox coeli machina, et tam velocissimus eius motus, et tam magnorum corporum distensio sive moles tacito silentique cursu moveatur?". EGIIDIUS OF ZAMORA, *Ars musica*, [in:] M. GERBERT, *Scriptores ecclesiastici de musica sacra potissimum*, Blaise 1784, reprint: Hildesheim, Vol. II, 1963: 376–378.

theon of the theorists of the thirteenth century than he has had so far. Most studies and encyclopedic articles mention him as a very conservative and not very original author whose greatest contribution to the theory of music was his discussion of instruments used in Spain,¹⁰⁵ whereas he is perhaps one of the most original authors, whose treatise is an accurate reflection of the tendencies in the science of the period under discussion.

The treatises by Hieronimus of Moravia or Egidius of Zamora discussed in the context of other works of this type, written in the thirteenth century, testify to the equivocal approach to Boethius' ideas characteristic of the works of the theorists and philosophers of the period. A few, in principle contradictory, tendencies can be identified here. On the one hand, most authors hardly introduced anything new to the concept of the trisection which, eventually became fossilized into an automatically accepted scheme, especially in its cosmological aspect. On the other hand, we can observe increasingly frequent attempts to adjust Boethius' classification to the reality of musical practice *ars antiqua*. This ambivalence is probably a result of the fact that Boethius' authority, established through his thinking about the mathematical aspects of the musical arts, and the role of his discoveries in this field, were not questioned at all. In this context, his ideas on the division of music, which were increasingly remote from reality, were quite problematic. What is more the idea of the existence of the music of the spheres became more and more difficult to sustain under the circumstances of increasingly widespread Aristotelianism.¹⁰⁶ This is probably why these elements of Boethius' teachings were usually not tackled in detail but only mentioned in passing. In this sense, the philosophers and theorists of the thirteenth century hardly made a contribution to the Boethian concept itself but the analysis of their works allows us to follow the reception of Boethius' idea at the time.

¹⁰⁵ This is what one of the most popular encyclopaedias of music says about Egidius: "Very conservative and depending greatly on the *auctoritas* (...)" [in:] S. Sadie (ed.) *The New Grove...* (2002), Vol. VII.

¹⁰⁶ M. Markowski says that "in spite of a ban on including Aristotle's natural and philosophical works in university lectures, which occurred among other places in Paris in 1210 and 1231, the university circles were fully aware of his cosmology". M. MARKOWSKI, *Filozofia przyrody w pierwszej połowie XV wieku* [Natural Philosophy in the First Half of the Fifteenth Century], [in:] Z. Kuksewicz (ed.) *Dzieje filozofii średniowiecznej w Polsce* [History of Medieval Philosophy in Poland], Vol. IV, Wrocław 1976: 6.

Summarizing this analysis of the reception of Boethius' idea and, more broadly, the theory of the music of the spheres in the thirteenth century, it is perhaps worth emphasizing a few significant moments. First of all, in the thirteenth century the idea of the music of the spheres had already managed to infiltrate areas of culture other than science and philosophy. By this time the concept was well illustrated in the visual arts and literature, just as it was increasingly marginalized in science. The intellectual culture of the thirteenth century, with its characteristic discipline in conducting disputes, raising a dispute itself to the rank of one of the most important cognitive tools, prepared the grounds for the criticism of traditional categories which had been used for centuries to describe the structure of the universe. The role of such figures as Peter of Auvergne, or perhaps the most distinguished and versatile scientists of the period of the golden age of scholasticism—Albert the Great—must not be forgotten.¹⁰⁷ This is what E. Witkowska-Zaremba says about the two authors in the context of discussing the handbook of music by Johannes de Muris:

The meaning of the word *deductio* (although Johannes de Muris did not quite provide an exact explanation of it) is important for at least two reasons. First of all the word relates to the way of listening to music; secondly it appears in the context of speculative music, which allows us to assume that *musica speculativa*, in the concept of Johannes de Muris, was not only a mathematical discipline, explaining the objective laws governing a musical interval, but was also an element of education, necessary to understand music and listen to it properly. This assumption is justified in the sense that this is the direction taken by the commentaries to [Aristotle's] *Analytics* by Albert the Great (ca.1200–1280) and Peter of Auvergne (d. 1304), and also Nicolas Oresme. *Musica speculativa* would have been, on the one hand, an element forming the listener's musical awareness (a listener would have to belong to an intellectual élite); and on the other, a factor which an educated musician-composer would have to take into account: *musica speculativa* would therefore be an intellectual reference point both for a composer and for a listener.¹⁰⁸

It is worth noting here that it was Albert the Great who was, next to Roger Bacon, one of the first great scholars contesting the existence of a real sound resulting from the movement of the celestial spheres. In the case of Roger Ba-

¹⁰⁷ We shall not discuss Albert the Great's views in detail here because there are extensive sources available on his work and in any case he does not devote too much time in his writings to the idea of the music of the spheres. Nevertheless his contribution to the discussion has to be considered as very relevant, if only because he was considered a great intellectual authority by the thinkers of his time.

¹⁰⁸ E. WITKOWSKA-ZAREMBA, *Musica Muris...* (1992): 52

con the main reason for rejecting the concept was his empiricism, which was irreconcilable with the idea of a non-perceptible music of the spheres. Albert the Great had an equivalent motivation but he was also driven by Aristotle's authority. Quoting the great Stagirite, Albert the Great in his *Commentary to Politics* by Aristotle rejected the existence of this type of music altogether.¹⁰⁹ He discussed the issue in an even broader sense in his *Commentary* on the treatise *De caelo et mundo*. The list of arguments that he presented there can be all found in Aristotle's text, but he also openly criticized Pythagoras and his followers, which later on made Johannes de Grocheio call them 'ignorant in logic'.¹¹⁰

Although much attention has been given to many cosmological ideas present in medieval literature, there is no doubt that discussions on the cosmology of Dante's *Divine Comedy* have led the way. However, one must not forget the thirteenth century literary work *Le Roman de la Rose* (The Romance of the Rose) by Guillaume de Lorris and Jean de Meun, which was remarkably popular in the late Middle Ages, and which, in a sense, is a poetical reflection on the cosmological ideas in circulation at the time and, more generally, of the image of the world and man's place in the world. The author of the first, shorter part of the poem, Guillaume de Lorris, was clearly inspired by the court culture and twelfth century troubadour poetry. Jean de Meun, the author of the second, longer part of the poem used a love story to create a great, metaphoric philosophical treatise, in which he was trying to describe the human condition against the backdrop cosmic order. It is certainly significant that Jean de Meun

¹⁰⁹ "Et ideo Augustinus in libro de Musica, loquitur de musica naturali, et antiqui omnes Stoici et Epicurei mirabilem harmoniam esse dixerunt in concentu motuum coelorum: quod tamen in libro de *Coelo et Mundo* reprobatur Aristoteles, eo quod corpus coeleste non est susceptivum peregrinarum impressionum: sonus autem fit ex impressione peregrina facta in aere ex percussione ad solidum planum". ALBERT THE GREAT, *B. Alberti Magnii, Ratisbonensis Episcopi, Ordinis Praedicatorum, Commentarii in Octo Libros Politicorum Aristotelis*, Book VIII, Ch. 3, [in:] A. Borgnet (ed.), *B. Alberti Magni Ratisbonensis Episcopi, Ordinis Praedicatorum, Opera Omnia*, Vol. VIII, Paris 1841: 774.

¹¹⁰ "Auctor autem hujus sententiae Pythagoras fuit, et dictus est ab eo stulte et superfluitate ignorantiae et dementiae in aliis, propter quod dixit ista: putaverunt enim illi homines, quod motus istorum corporum faciat sonum, eo quod viderunt apud nos in satis minoribus quantitate corporibus quam sit sol et luna, et quae non habent adeo velocem motum sicut est motus coelestium diurnus, accidere sonum necessario ex incessu eorum". ALBERT THE GREAT, *Liber II de Coelo et Mundo*, Book II, Ch. 10, [in:] A. Borgnet (ed.), *B. Alberti Magni Ratisbonensis Episcopi, Ordinis Praedicatorum, Opera Omnia*, Vol. IV, Paris 1840: 192.

had translated Boethius' *De consolacione* into Old French, as much of *Romane de la Rose* remained under the obvious influence of the first scholastic writer. Among other authors who inspired Jean de Meun were Alain de Lille (*Anticlaudianus*, *De planctu naturae*), Bernard Silvestris (*De mundi universitate*) and Vincent of Beauvais (*Speculum maius*). This part of the romance includes fragments of an authentic letter from Heloise to Abelard, and other motifs from Robert Grosseteste, Roger Bacon or even Witelo.¹¹¹ Among many cosmological themes present in *Romane de la Rose* there is a mention of the music of the sphere, in lines 16949–16954:

Resplendent heavenly bodies shining in their darkened air as they turn in their spheres,
just as God the Father ordained. There among themselves they create harmonies which
are the source of the melodies and different tones that we arrange in chords; in every
kind of song, nothing sings except through them.¹¹²

In the *Romane de la Rose*, which through its popularity affected the consciousness of many generations,¹¹³ the music of the spheres featured as an

¹¹¹ WILHELM Z LORRIS, JAN Z MEUN [Guillaume de Lorris, Jean de Meun], *Powieść o róży* [The Romance of the Rose], transl. M. Frankowska-Terlecka, Giermak-Zielińska, Warszawa 1997, *Introduction*: 5–42. Witelo, the son of Henry of Żytyce and an unknown Polish woman, is a very interesting individual and the author of an important work entitled *Perspectiva*. M. Markowski considers Witelo to be one of the originators of research on natural philosophy in Poland. M. MARKOWSKI, *Filozofia przyrody...* (1976): 20. We shall not discuss Witelo in detail because, as J. Burchardt's research shows, he did not consider the issue of the music of the spheres. J. BURCHARDT, *Kosmologia i psychologia Witelona* [Witelo's Cosmology and Psychology], [in:] *Studia Copernicana*, Vol. XXX, Warszawa 1991. We know that around 1430, Sędziwój z Czechła held lectures on optics in the Krakow Academy on the basis of Witelo's handbook. J. Wiesiołowski, 'Sędziwój z Czechła (1410–1476). Studium z dziejów kultury umysłowej Wielkopolski' [in:] *Studia Źródłoznawcze*, No. 9, Warszawa 1964: 75–104.

¹¹² Oxford Worlds Classics, *The Romance of the Rose*. A new translation by Frances Horgan, Oxford, 1999: 262.

In the Old French original:
„Là font entr'eus lor armonies,
Qui sunt causes del melodie
Et des diversités de tons,
Que par acordance metons
En toutes manieres de chant:
N'est riens qui par celes ne chant (...).”

M. Méon (ed.) *Le Roman de la Rose par Guilleme de Lorris et Jehan de Meung*, V. III, Paris 1814: 135.

¹¹³ The *Romance* continued to be popular for centuries, a fact testified to by almost three hundred or so manuscripts which included the poem, and between 1481 and 1505 it was published fourteen times. See: WILHELM Z LORRIS, JAN Z MEUN, *Powieść...*, *Introduction* (1997): 36.

actual sound phenomenon. This fact is undoubtedly significant, not so much for the reception of Boethius' theory but in a broader sense for the understanding of the Pythagorean concept of the harmony of the spheres. This popular work of literature could have a much broader impact on the beliefs of its many readers than the much less accessible and often linguistically difficult academic disputes of scholastic scholars. And so independently of a weakening role of the concept of the music of the spheres in thirteenth century philosophy and music theory it was eventually transformed into a literary motif and could successfully develop, not only in literature, but also in other arts. In fact, a famous condemnation of 219 theses taught at the faculties of arts was very relevant to the intellectual climate of the second half of the thirteenth century and to the entire later period of medieval philosophy. The official document was issued on 7 March 1277 by the Bishop of Paris, Etienne Tempier, though the dispute that it regarded had been in progress for a long time. This is what E. Gilson says about it:

The Condemnation of 1277 is a landmark in the history of medieval philosophy and theology. There is no way to measure its influence, for the simple reason that it itself was the symptom of an already existing reaction against the excessive philosophical independence of some masters in philosophy and theology. The condemnation was not a starting point; it initiated nothing; it did not even issue any warning that was new; only, because of the solemnity of the two prohibitions, at Paris and at Oxford, the general atmosphere of the schools became different. Instead of carrying on its effort to conquer philosophy by renovating it, scholasticism acted on the defensive. At that very moment, its golden age came to an end. (...) In a general manner, the marks of this change in mood are visible in the theologies of the fourteenth century, especially those of Duns Scotus and Ockham."¹¹⁴

The condemnation, aimed mostly at the Latin averroists, led by Siger of Brabant and Boethius of Dacia, attacked the thesis put forward by many other authors, among them St. Thomas Aquinas. In the context of this intellectual storm, which involved some of the main academic centres, the ideas proposed by musical theorists of the time, including the music of the spheres, were largely marginalized. However, a few decades later, at the beginning of the fourteenth century, the discussions around the idea of the music of the spheres and musical practice became no less ferocious, with two momentous

¹¹⁴ E. GILSON, *History...* (1980): 408.

events especially notable: the announcement of the *Docta Sanctorum*¹¹⁵ papal bull and the publication of Johannes de Grocheio's treatise. Independently of the frequently raised criticisms, the intensity of which grew with the increasing popularity of Aristotle's writings, the concept of the harmony of the spheres enjoyed a revival, especially in the seventeenth century.

Kepler captured this truth in the fullest yet most concise way when he said "Celestial motions are nothing but continuous music for many voices, which can be embraced not by spirit but also by intellect".¹¹⁶

Translated by Marta and Garry Robson

¹¹⁵ The document issued by John XXII at the turn of 1324/25, in which he condemned *ars nova*.

¹¹⁶ Johannes KEPLER, *Harmonices mundi libri V*, Lincii 1619, A. OLSZEWSKA, *Harmonia uniwersum i średniowieczne podstawy jej wyobrażeń w traktatach Johannesa Keplera, Roberta Fludda i Athanasiusa Kirchera* [Harmonia universum and the medieval basis for its representations in the writings of Johannes Kepler, Robert Fludd and Athanasius Kircher], [in:] *Kosmologia. Obraz świata w nowożytności* [Cosmology. The Image of the World in Modern Times], a catalogue from the exhibition in Muzeum Uniwersytetu Jagiellońskiego [The Museum of the Jagiellonian University], Kraków 2009: 64.

Abstract

The theory of “music of the spheres” (*musica mundana*) introduced by Boethius in his treaty *De institutione musica* is an original contribution in development of the mediaeval theory of music. The idea of music of the spheres—as presented by the Pythagoreans—became one of the most influential cosmological concepts despite being criticized by Aristotle in his *De caelo*. The twelfth century is among the most important periods from the point of view of the reception of the discussed theory. It is often called the *aetas Boethiana* as it is distinguished by an increased interest in the works of Boethius, with special emphasis on his theological writings and *Consolatio*, which was very popular at the time. The reason behind this phenomenon was a growing specialization of issues relating to the theory of music, which finally led to its independence from other areas of knowledge; yet this is not the only cause for the subject of the harmony of the spheres to be again widely discussed in philosophical circles. Another great contributing factor was the development of Neo-platonic philosophical schools, such as the famous School of Chartres. The interest in natural sciences in the School of Chartres and later in the Oxford School made the scientists of the time focus on the works of the authors whose ideas were essential to the concept of the harmony of the spheres, among them such philosophers as Calcidius, Macrobius and Boethius.

Keywords: harmony of the spheres, medieval philosophy, cosmology, music theory, Boethius.